

Overview of Austrian Banks' Internal Credit Rating Systems

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I Introduction

Under the Financial Market Supervision Act (Finanzmarktaufsichtsgesetz), the rules of the Austrian Banking Act (Bankwesengesetz) governing the Major Loans Register (Großkreditevidenz) have been expanded to include additional reportable items. Accordingly, as of the start of 2003,¹⁾ Austrian credit institutions have to report to the Oesterreichische Nationalbank (OeNB) for each reportable borrower²⁾ also the value of collateral held against major loans, the amount of specific loan loss provisions made and the credit rating given to the borrower. The rules of Article 75 paragraph 1 item 4 of the Banking Act are supplemented by the OeNB's guideline on reporting major loans. Under this guideline, banks are obliged to disclose to the OeNB also their internal principles and rules for the valuation of collateral, the calculation of specific loan loss provisions and the establishment of internal credit ratings. This documentation is to provide a description of the procedures and methods used as well as of their integration into the overall credit risk management. Initially, it will be sufficient for banks to submit the documents they use internally for those purposes.

The expansion of the reporting requirements for the Major Loans Register was worked out by the Austrian supervisory authorities together with the OeNB and the banking industry. This step was motivated by the need to meet the increasing demand for information about credit quality from international bodies such as the International Monetary Fund and the

World Bank. Moreover, the idea was to initiate joint preparations for the requirements to be introduced under the new capital adequacy framework ("Basel II") due to take effect at the end of 2006. Basically, this type of information is to enable the supervisory body to perform two types of analyses:

- to assess the quality of (major) loans portfolios
- to assess the quality of credit risk rating systems

These analyses are now being implemented at the OeNB step by step. In this process, the OeNB will publish important findings through its various means of communications. This first report provides an overview of the credit rating systems Austrian banks use. The procedures employed for the valuation of collateral and the calculation of risk provisions are to be analyzed at a later date. This overview is based on the system descriptions provided by the Austrian banks to date. It is preceded by a theoretical section outlining a general framework for a comparison of the banks' credit rating systems. The criteria derived from this exercise will then be used for comparing the Austrian banks' credit rating systems. By way of introduction it is pointed out that the system descriptions provided by the banks as a first step were compiled with different levels of detail and therefore do not always cover all areas required for a comprehensive analysis. This initial overview is therefore confined to a number of key components of banks' internal credit rating systems. The concluding summary aims to assess the status of the Austrian

1 The reporting duty commences in the fiscal year ending after April 1, 2002. As the majority of banks have fiscal years ending on December 31, the first reporting date for most banks is January 31, 2003.

2 Loans qualify as major loans if the borrower's credit line or use of a facility is in excess of EUR 350,000.

banks' credit rating systems, specifically with a view to Basel II and to identify potential further steps in the analysis of credit risk rating systems and loan portfolios.

2 Potential Frames of Reference for Banks' Internal Credit Rating Systems

In the past few years, the focus of theoretical studies and practical applications has shifted increasingly to a common frame of reference for diverse credit rating and credit risk measurement procedures, with new developments in banks' credit risk management practices being a key driving factor in this process. Since about the mid-1990s, banks operating internationally have increasingly been introducing integrative control practices based on risk-return principles to all business functions. A key component of such practices is a standardized measurement of risk across banks' different categories of risk. At the same time, new risk measurement methods have been developed, mainly to control market risk, and applied to other types of risks as well. This confronted many banks with the practical challenge of rendering not only different types of risk – such as market risk and credit risk – comparable but of also standardizing risk measurement for different categories of credit risk, such as corporate loans, retail loans as well as interbank lending and sovereign lending.

These developments in the banking sector are now being recognized in reforming the capital adequacy framework. Under Basel II, the international supervisory authorities are seeking to establish a general framework for credit risk classification and measurement that is designed to cover

the different types of banks' internal systems as well as external ratings. In addition, the Basel Committee for Banking Supervision, while working on the reform of the capital adequacy framework, has also been considering the definition of generally recognized standards for credit risk management. In developing our frame of reference we therefore start with the general requirements to be met by credit risk management and, on that basis, discuss the current proposals for Basel II. This will be supplemented by some references to theoretical considerations.

2.1 The Supervisory Framework for Banks' Internal Credit Rating Systems

The Principles for the Management of Credit Risk issued by the Basel Committee for Banking Supervision (2000) in September 2000 address the following four areas of credit risk management:

- credit risk strategy and policy
- the credit-granting process
- credit administration, measurement and monitoring
- credit risk control

The standards for risk classification systems in the area of credit administration, measurement and monitoring are specified in more detail, with a special focus on the following areas:

- continuous monitoring of the quality of each loan including procedures for determining adequate risk provisions
- development and operation of an internal risk classification system for a differentiated identification of credit risk
- information system and analytical methods for the measurement of credit risk

The principles governing credit-granting activities include an additional list of criteria to be applied in determining a borrower's legal capacity to borrow and credit-worthiness prior to approving a credit, such as the purpose of the credit, the borrower's risk profile, its debt repayment capacity and debt service history, the management's business expertise, the status of the borrower's industry, the terms and conditions of the credit, the adequacy of collateral and guarantees as well as the borrower's personal integrity.

The Principles for the Management of Credit Risk published by the Basel Committee for Banking Supervision (2000) include only a very general description of the required credit rating system. Specific aspects of credit assessment are addressed only in the standards governing the credit-granting process. As another essential observation, the credit rating system is regarded as a component of an overall risk classification system that is closely integrated with ongoing credit monitoring and risk measurement activities.

In the current proposals for Basel II, the key rules for credit risk classification are found in the so-called minimum requirements for internal ratings and the admission criteria for external ratings.

The rules governing the recognition of outside credit rating agencies focus on the validation of ratings on the basis of published data including default histories, transition statistics or ratios between upgrades and downgrades. With regard to credit rating methods the very general requirement is that these have to be validated strictly and systematically against historical data. Ratings have to be reviewed on an ongoing basis and

adapted to changed economic circumstances. In addition, the rating agency is required to have adequate resources to be able to maintain continuous contact with the managements of the rated enterprises to assure the quality of the rating results.

The minimum requirements to be met by internal rating and risk measurement systems are to ensure, quite generally, a valid assessment of borrower and transaction characteristics, adequate risk differentiation and sufficiently exact and consistent estimates of the risk parameters. The highly detailed rules are subdivided into rating system design, rating procedures, corporate governance and control, use of rating results in credit risk management, risk quantification, validation of risk parameter estimates, use of supervisory estimates, and disclosure rules. The key details of the provisions that appear to be essential to the following analysis of credit rating systems are identified and summarized below.

The rules for system design define, first of all, the concept of the rating system. According to the capital adequacy framework, the term "rating system" comprises "all of the methods, processes, controls, and data collection and IT systems that support the assessment of credit risk, the assignment of internal risk ratings, and the quantification of default and loss estimates." A bank's internal credit assessment system is thus to be viewed as an integrated part of a bank's internal rating system. Within an asset class – in the internal ratings-based (IRB) approach, Basel II differentiates the following asset classes: corporate exposures (including special lending), sovereign exposure (including loans to certain other public sector entities), bank exposure, retail exposure and equity exposures as well as eligible purchased

receivables and securitized assets – a bank may use different rating systems. The question of the minimum number of different rating systems a bank has to operate has not been addressed specifically. Based on the other rules, particularly the roll-out rules and the rules for risk quantification, it is to be assumed, however, that different rating systems will have to be applied to corporate exposures, sovereign exposures, interbank exposures, and retail exposures. Equity exposures may be grouped with corporates (at least for the purpose of credit rating), purchased receivables and securitized assets with the rating system that applies to the underlying type of receivable. The situation is less clear with regard to a separate rating system for special lending, which the proposals had long recognized as a separate class of assets, and with regard to exposures to small- and medium-sized enterprises (SMEs), which depending on the total debt outstanding may be classified either as corporate or as retail exposures. Overall, it may be concluded from the above that under the IRB approach banks require different credit rating systems for different categories of borrowers.

Another key provision concerning rating design relates to the rating dimensions. Basically, a two-dimensional rating system is called for, which assesses and measures borrower-specific risks and transaction-specific risks separately. Credit rating is thus to be separated from the assessment of the loan agreement structure, e.g. debt service hierarchies and any collateral and guarantees that may be involved. A separate transaction rating should be employed for the second rating dimension. For banks that wish to pursue only the foundation IRB approach, a so-called facility rating will be adequate, which – similar to a rat-

ing agency's issue rating – merely modifies the credit rating by taking into account transaction characteristics. Exceptions are allowed only for special lending, e.g. for real estate projects, for which a two-dimensional system is not required, as in such cases the borrower's credit rating is virtually inseparable from the valuation of the collateral. For retail lending, a fundamentally different type of risk classification is required. Borrowers or loans with identical risk characteristics are to be aggregated into so-called risk pools. Criteria for such pooling are, first, borrower characteristics and, second, transaction characteristics as well as various stages of payment delinquency.

Another central element of system design is the number of risk classes. Under the IRB approach, a minimum of seven rating classes have to be provided for performing borrowers and a minimum of one class for nonperforming borrowers in order to ensure sufficiently fine risk differentiation. A minimum number of classes has not been specified for the purpose of transaction or facility rating. For special lending, only a minimum number of four classes of performing borrowers are required if a simplified risk weighting procedure is used. A minimum number of pools for retail exposures has not been specified.

The provisions relating to the rating criteria are worded in very general terms and regulate their level of detail, transparency, consistency of application as well as the completeness and timeliness of information. The rating horizon should be longer than one year. For the use of statistical models slightly more detailed requirements have been defined regarding proof of their forecasting ability and periodic review.

Of the provisions governing rating procedures those regulating rating coverage appear to be of importance in the context of credit rating systems. Basically, credit ratings are required for all borrowers and all counterparties in transactions that are sensitive to credit risk. In addition, banks have to implement processes for the ongoing procurement of information about changes in the borrowers' credit standing and other facts relevant to risk, such as changes in the valuation of collateral. A formal rating procedure has to be performed for each borrower at least once annually. Exemptions are provided, however, for retail exposures, where ongoing monitoring may be confined to a representative sample of the loans in a pool.

The provisions for risk quantification describe the procedures eligible for estimating the probability of default for each credit class. As a general rule, these should be based on internal credit loss data in conjunction with external data, e.g. from outside rating agencies, and so-called pooled data, such as data originating from several banks operating equivalent credit rating systems.

With regard to the credit rating systems, the current proposals for Basel II are much more detailed than the Principles for Credit Risk Management, particularly where rating classes and rating dimensions are concerned. Rating criteria, however, are likewise defined only in very general terms.

2.2 Theoretical Considerations on Banks' Internal Credit Rating Systems

In recent years, the theoretical literature about general standards for rating systems has also been influenced strongly by the consultations on Ba-

sel II and has therefore likewise addressed the subject of comprehensive risk classification systems (RCSs). The following summarizes the requirements to be met by credit rating systems as defined in a number of representative articles.

Krahnhen and Weber (2001) set out the theoretical requirements for risk measurement and, from these, derived the following key principles for credit assessment:

- a bank's rating system should be able to rate all of its past, current and future clients
- there should be as many different rating systems in place as necessary and as few as feasible
- risk classification should be as fine as necessary
- the rating system should be information efficient, i.e. all of the information available should be correctly factored into the rating

Garside and Greenman (2002) define the essential elements of a robust rating system that have to be incorporated in any bank-wide risk measurement system in a similar manner, from a consulting company's perspective:

- a two-dimensional rating structure with separate rating of borrower and transaction risks
- a differentiated master scale for credit risk, calibrated to a credit cycle-neutral probability of default
- different credit rating systems for different customer groups based on a common master scale
- differentiation of transaction-specific risk factors by product and collateral characteristics
- recognized validation processes to establish the reliability of rating tools and calibrating parameter estimates

Harris (2002) examines banks' internal rating systems from an outside

rating agency's perspective and arrives at similar criteria:

- adequate degree of risk differentiation for each business area
- separate assessment of the borrower and the facility
- consistent application across the entire banking group
- tracking of default and loss events and integration of findings into system development

The steps of a prototypical risk classification process as defined by Crouhy et al. (2002) are outlined below as representative of the numerous articles about the credit rating criteria of an internal rating system from a bank's point of view:

- (1) assessment of a borrower's financial status

Result of step 1: **preliminary borrower rating**

- (2) analysis of management quality
- (3) the borrower's competitive position
- (4) assessment of the quality of financial information
- (5) analysis of country risk
- (6) comparison with external rating information, if available
- (7) analysis of lending structure

Result of steps 1 to 7: **final borrower rating** and probability of default

- (8) assessment of loss in case of default across the various facilities
- Final result: **facility rating** representing the product of probability of default and expected amount of losses

In addition, reference is made to a list of rating criteria that was still part of the second consultative paper of the Basel Committee for Banking Supervision on the new capital adequacy framework but was then removed.¹⁾

- (1) the borrower's capacity to earn cash flows for funding debt service and maintenance of business activities
- (2) capital structure
- (3) profitability
- (4) quality of borrower information
- (5) diversification of business activities and sources of income
- (6) financial flexibility and access to financial markets and alternative sources of finance
- (7) management capabilities
- (8) competitive position in the industry and industry outlook
- (9) country risk

2.3 Areas to Be Analyzed by Credit Analysis Systems from Supervisory and Theoretical Perspectives

The Principles for Credit Risk Management published by the Basel Committee for Banking Supervision do not have to be implemented in Austria immediately, and the current proposals for Basel II can still be amended before implementation in 2006. Nonetheless, a number of key areas can be identified for an initial analysis of the credit rating systems from a supervisory perspective. A selection of theoretical articles written from different perspectives suggests roughly the same areas to be analyzed by credit rating systems. Within the scope of this paper, only a limited selection of potential areas can be made on the basis of the highly heterogeneous information base (see above). Therefore, the following important aspects of credit rating systems are to be examined empirically with a view to the Austrian banks below:

- basic orientation: pure credit rating or transaction rating

¹ Quoted for instance by Szczesny and Ewert (2002).

- specialization and completeness: general rating system or focus on specific categories of borrowers
- degree of differentiation: number of rating classes
- methodological basis: expert system or statistical model
- information content: coverage of relevant areas of analysis
- basis for risk measurement: combination with external ratings

3 Analysis of Austrian Banks' Credit Rating Systems

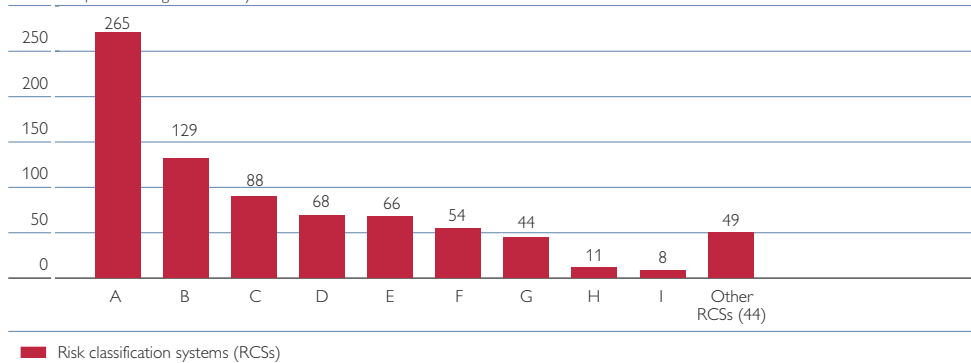
3.1 Underlying Data

The OeNB has received the system descriptions of a total of 782 banks' RCSs. These RCSs each consist of one or several credit analysis systems,¹⁾ with banks belonging to the same banking group or sector typically using the same RCS. Overall, the Austrian banks were found to operate a total of 53 different RCSs.

Chart 1

Distribution of Risk Classification Systems

Number of banks using the same system

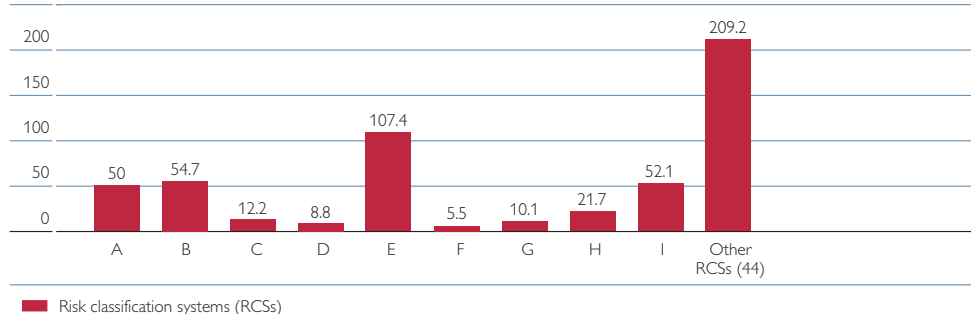


Source: OeNB.

Chart 2

Distribution of Total Assets by Risk Classification System

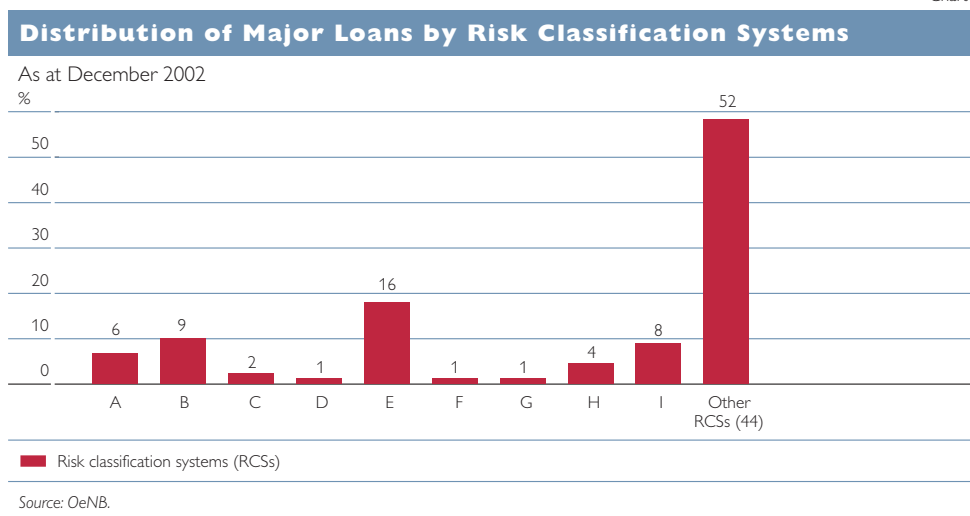
EUR billion



Source: OeNB.

¹ The terms "risk classification system" and "rating system" are used synonymously and, as explained in section 2.1, comprise both credit analysis systems, which examine borrower-specific risk, as well as assessment systems for transaction-specific risks.

Chart 3



Identical systems are those for which the banks specifically reported using a shared system. Chart 1 shows the distribution of RCSs, i.e. the number of Austrian banks sharing a system:

Of the total number of 53 RCSs, 9 systems (A–I) are used by more than three banks and, overall, by approximately 95% of all credit institutions having submitted reports to date. Of the remaining 44 RCSs, 3 are used by two banks each and 41 by just one single institution.

The charts 2 and 3 show the distribution of total assets by RCS (chart 2) and the distribution of major loans by RCS (chart 3) as at December 2002. These charts clearly show that large institutions tend to use their own systems whereas small banks affiliated with a specific banking sector use shared RCSs.

3.2 Basic Orientation

Almost all of the RCSs reported assess borrower-specific and transaction-specific risks separately. Only some very small institutions use a mixed system, i.e. one that factors in both borrower-specific and transaction-specific ratings. These institutions are unable to separate these two as-

pects (as required for the reporting of major loans) and report only the borrower-specific portion of the credit rating.

3.3 Specialization and Completeness

Two-thirds of all RCSs reported include only one single general credit rating system, i.e. all borrowers are reported through one undifferentiated system. The other RCSs distinguish

Chart 4

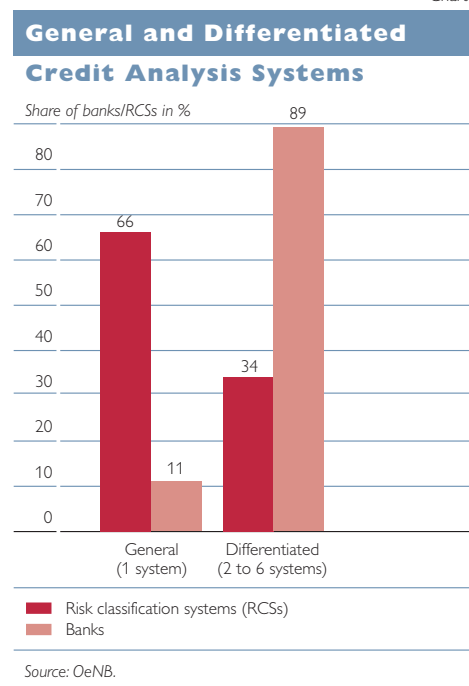
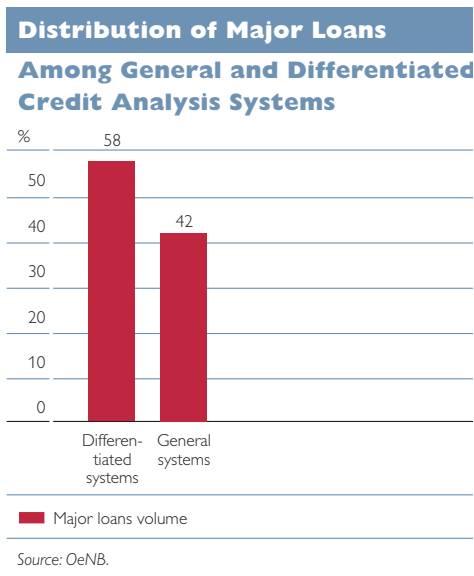


Chart 5



fact operate a differentiated assessment procedure for different customer groups in the background.

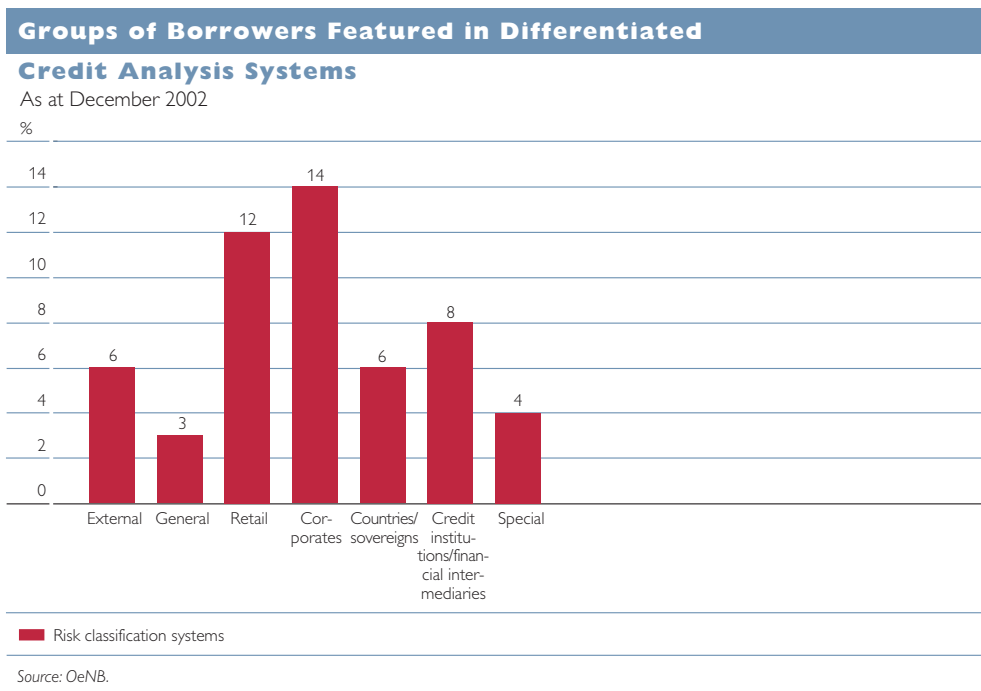
As at December 2002, about 60% of major loans were reported by banks with differentiated systems and about 40% by banks with a general system (see chart 5).

This distribution of volumes shows that even some of the larger banks reported using only a general system. This lends added weight to the assumption that they use in fact a so-called “master scale,” which means that the bank feeds data from its different credit rating systems into a single scale for major loan reporting purposes.

between different groups of borrowers, with the number of credit rating systems varying between two and six. Overall, however, about 90% of the banks use a differentiated system (see chart 4). In addition it may be presumed that some of the banks that report using only a general system in

Chart 6 shows the typical borrower groups of the 18 RCSs that feature differentiated credit rating systems. The borrower group appearing most frequently in credit analysis systems is “corporates” followed by “retail.” One-third of the risk classification systems also include ratings from international rating agencies (“exter-

Chart 6



nal”), which are incorporated into risk classification directly, without prior conversion to an internal credit scale. The three RCSs featuring a “general” group use this category as a second system besides an external rating, which means that borrowers with an international rating are covered by the external rating while all other borrowers are rated by the “general” model. The use of separate rating models for SMEs is rare. The borrower group named “special” comprises systems used, e.g. for investments, SMEs, cross-border borrowers, agricultural businesses or tourism. Special rating procedures for start-up enterprises are likewise used only occasionally. More frequent are rules in corporate rating systems providing for newly founded enterprises not to be rated above a certain level.

With all banks, the problem of non-rated borrowers is one that seems to be negligible. On the one hand, this involves only certain groups of clients, such as securitized assets in the trading book or pass-through loans. A ma-

ajor part of non-rated borrowers are in fact clients who have not been rated yet owing to incomplete documentation but who will be rated in the future.

3.4 Degree of Differentiation

The rating classes can be broken down into performing classes for active borrowers and nonperforming classes for clients who are defaulting or where a loss has been incurred already.

Chart 7 illustrates the 35 RCSs with only one single credit analysis system (general systems, no differentiation by borrower groups) broken down into performing (left) and nonperforming (right) classes.

A clear majority of banks with a general credit analysis system uses one to six performing and up to two nonperforming classes. Any further differentiation particularly of the nonperforming classes is not very common.

The 693 banks reporting differentiated credit analysis systems with several borrower groups show a clear bias

Chart 7

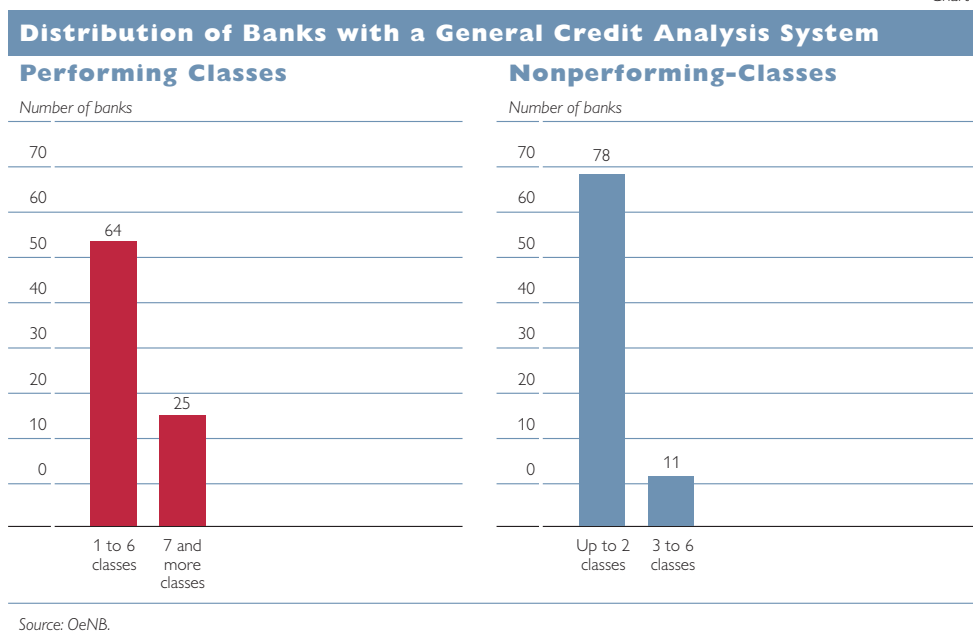
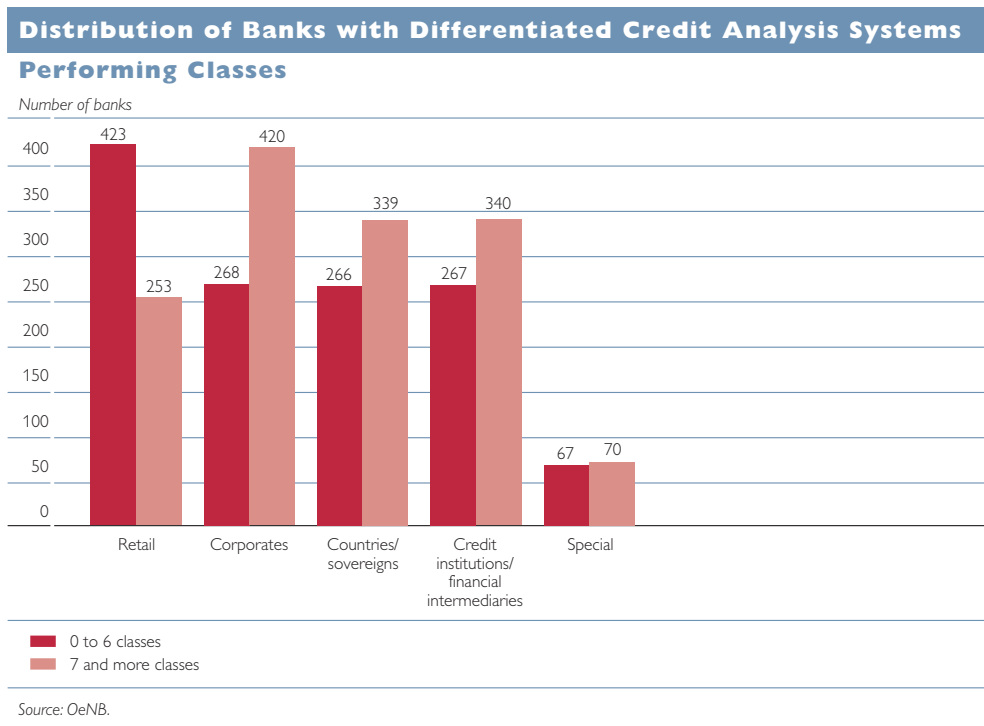


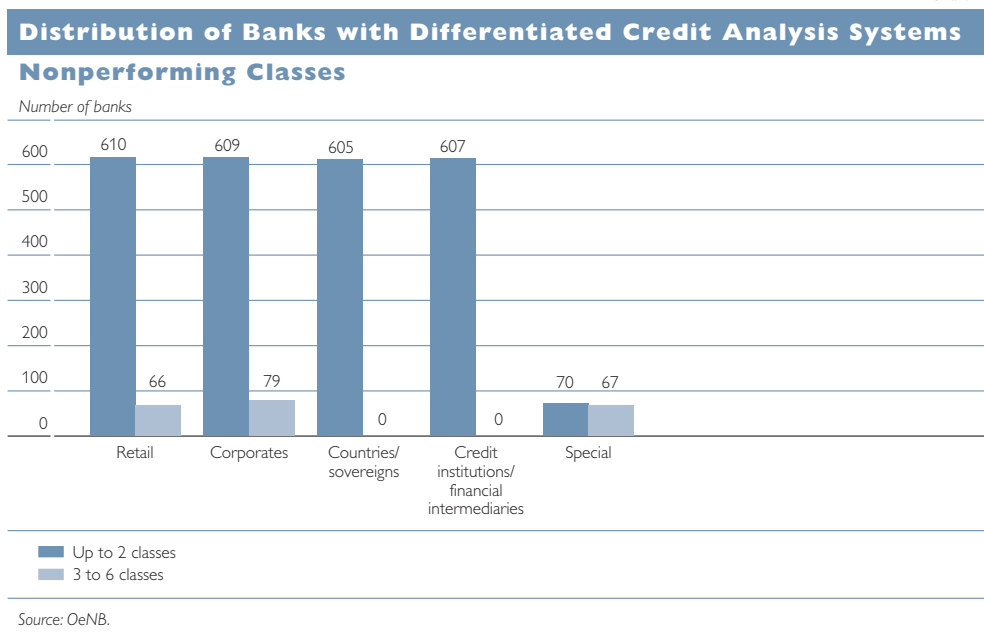
Chart 8



towards more differentiated systems in the performing classes (chart 8). Specifically the borrower groups “corporates,” “countries/sovereigns,” and “credit institutions/financial intermediaries” predominantly have rating scales comprising seven or more

levels. Scales with up to six levels predominate only in the “retail” exposures. With the nonperforming classes (chart 9) as with the general systems a less detailed subdivision (up to two levels) is the most common method.

Chart 9



3.5 Methodological Basis

Credit rating models are generally classified as statistical methods based on defined ratio analyses and standardized questions, expert systems based on individual analyses, and mixed systems comprising both standardized ratios and questions as well as individual analyses.

A perusal of system descriptions revealed that the large banks use statistical methods for the majority of their borrowers, i.e. for the “bulk business.” These statistical methods rely on defined ratios and scores for information about the management. They are applied primarily to the client categories “retail” and “corporates.” Small institutions that do not employ a shared system within a group or a sector usually operate expert systems or mixed procedures combining fixed ratio valuations and free analyses.

Large banks likewise use, in addition to statistical methods, expert systems for an individual assessment of special businesses such as project or cross-border finance. For bank and country ratings, even larger banks frequently employ mixed systems utilizing external ratings along with individual analyses.

3.6 Information Content

The rating criteria used are of course highly heterogeneous and differ in detail among bank and client segments. Within the scope of this paper only a very general overview can be given.

As regards the approaches used for corporate credit analysis (SMEs and large enterprises), the majority of the credit rating systems analyzed rely on three different mechanisms: quantitative factors, qualitative factors, and warning signals/negative information.

With most banks, the quantitative factors considered are derived almost exclusively from an analysis of the annual financial statements, with the main focus being on the equity ratio and the debt structure. In addition, dynamic cash flow or EBITDA-based ratios are considered, such as EBITDA (earnings before interest, taxes, depreciation and amortization) versus bank liabilities or cash flow versus operating performance. Other inputs factored into the analysis include other ratios such as turnover ratio or credit periods.

In addition to analyzing the annual financial statements, some banks also examine account information such as use of overdrafts and credit lines, repayment periods and credit balances versus turnover.

For an assessment of the qualitative factors most of the statistical models use a questionnaire with a scoring system. In assessing soft facts, banks look primarily at questions relating to the management, the accounting system and the borrower’s market position. Particular attention is devoted to the quality of the management, succession rules, the enterprise’s position in the market, its geographical location, the quality of its accounting system, orders booked and the quality of the organization.

Very often current negative information and additional warning signals are taken into account in analyzing and rating enterprises. Such additional information is frequently rated in a standardized manner. Of interest are primarily delays in paying interest charges and redeeming principal, changes in the use of overdraft facilities or disputes with the management. With this type of data, the main focus is on the currency of the information.

Where the analysis of retail clients is concerned, the credit rating systems

studied are very similar. The main criteria are annual income, private wealth, type of occupation, trade references and an account analysis. The resulting scores are usually entered into a questionnaire in a semi-automated process to obtain a rating.

In the case of bank and country ratings, the internal credit analysis is very frequently based on external ratings supplied by international rating agencies. In addition, however, the banks often also conduct their own analyses, which frequently are modeled after expert systems or mixed systems.

3.7 Basis for Risk Assessment

Only a very small number of credit institutions quote probabilities of default for the individual rating classes in their system descriptions. It may be assumed, however, that more banks have estimates of credit losses or are about to compile time series as a basis for such estimates. On the other hand, many banks include into their system descriptions conversion factors for translating their own ratings into the scores of one or several external rating systems. With this type of conversion, however, some slight differences may arise when translating data for various rating systems used by external agencies.

4 Summary

A first analysis of credit rating systems based on system documentations provided to the OeNB to date by 782 credit institutions as part of major loan reporting yields the following preliminary findings:

- Almost all credit institutions operate a two-dimensional rating sys-

tem which assesses and measures borrower-specific risks and transaction-specific risks (loan agreement structure) separately.

- The majority of institutions also use credit rating systems that differentiate between different groups of borrowers. While separate systems for corporate and retail clients are the rule, about half of these RCSs also have separate credit rating systems for sovereigns and banks. With these exposure categories, external ratings are increasingly used for risk classification. It is pointed out in this context, however, that some banks have probably reported a “master scale” while in actual fact running differentiated systems.
- Assuming a minimum number of seven performing classes as currently required under Basel II and one default class¹) as a benchmark, one finds that the majority of the rating systems that differentiate by groups of borrowers would be deemed sufficiently differentiated. With the general credit rating systems, the number of rating levels is lower in most cases. Here reference is made again to the problem mentioned above, i.e. of banks using a “master scale.”
- The methodological basis is predominantly a mix between statistical methods and expert systems. In some groups, e.g. retail clients, statistical methods predominate while for other groups, such as sovereigns, banks or special lending, pure expert systems are used.
- Within the scope of this paper it is not possible to offer more than an overview of the rating criteria em-

¹ The definition of nonperforming classes used in most risk classification systems deviates from the definition of “default” employed in Basel II. Therefore, no direct comparisons are undertaken for this rating class.

ployed. No fundamental differences were found among the banks, however.

- A number of banks are in the process of developing risk measurement on the basis of credit rating systems. Translating internal credit classes into rating levels specified by external agencies seems to be a commonly used method, however. As already mentioned, the current proposals for Basel II are still open to modification prior to their implemen-

tation in 2006. Nonetheless, some important conclusions can already be drawn from this initial analysis of credit rating systems from a supervisory perspective. The credit rating systems of most Austrian credit institutions are basically ready to meet future supervisory requirements in terms of basic orientation, specialization and degree of differentiation and there is no need for fundamental adjustments.

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