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CFS Working Paper Nr. 98/14

Empirical Analysis of Credit Relationships in Small Firms Financing: Sampling Design and Descriptive Statistics[#]

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July, 1998

Abstract: Despite the relevance of credit financing for the profit and risk situation of commercial banks only little empirical evidence on the initial credit decision and monitoring process exists due to the lack of appropriate data on bank debt financing. The present paper provides a systematic overview of a data set generated during the Center for Financial Studies' research project on "Credit Management" which was designed to fill this empirical void.

The data set contains a broad list of variables taken from the credit files of five major German banks. It is a random sample drawn from all customers which have engaged in some form of borrowing from the banks in question between January 1992 and January 1997 and which meet a number of selection criteria. The sampling design and data collection procedure are discussed in detail. Additionally, the project's research agenda is described and some general descriptive statistics of the firms in our sample are provided.

Keywords: Credit management, credit-file data set

JEL classification: G21

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1 Introduction

Commercial banks' management of credit relationships is mainly based on individual experiences and procedures and is, therefore, not standardized and somewhat unstructured. The importance of the credit business for the profit and risk situation of commercial banks and the question of future regulatory requirements make discussion and analysis of these management techniques increasingly relevant, both from an academic and from a practical viewpoint. Issues at hand are the market valuation of credit risk, regulation and problems related to the optimal design of credit contracts. In this connection, the *Institut für Kapitalmarktforschung - Center for Financial Studies* is carrying out a research project which combines theoretical and empirical research into the issues mentioned above.

Economic literature on credit business mainly focuses on the theoretical analysis of contract design and financial intermediation.[1] Over the past few decades, this theoretical work has typically been based on an asymmetric information framework.[2] Three general fields of research can be distinguished:

- bank loan term determination,[3]
- contract renegotiation,[4]
- market valuation and tradability of credit risk.[5]

All of these research fields are characterized by a lack of empirically founded knowledge, especially with respect to the German banking system.[6] Thus, the Center for Financial Studies' project „Credit Management" was primarily designed to fill this void.

The present paper provides a systematic overview of the sampling design and data collection procedure used to generate the data set underlying all of the project's empirical analyses.

The paper is organized as follows. Section 2 briefly describes the project's research agenda. Section 3 discusses the data collection procedure and sampling design in detail. Among other

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[1] For an overview see Bhattacharya/Thakor (1993) and Hellwig (1991).
[2] A useful discussion of the fundamental concepts and their applications is provided by Hart (1995). A comprehensive discussion of the incomplete-contracts approach is provided by Tirole (1994).
[3] See Saunders (1997) for an overview.
[4] See Hubermann/Kahn (1988) for a discussion of the term „renegotiation" and Machauer/Weber (1995) for a brief overview of the theoretical literature.
[5] See e.g. Rudolph (1995). A general discussion of issues relating to credit derivatives can be found in *Financial Derivatives and Risk Management*, No. 5, March 1996.
[6] Recent studies on the uniqueness of the US banking system are Billett/Garfinkel/Flannery (1995) and James (1995), (1996).

things, the procedure for drawing the random sample and the information content of the data set are presented in detail. Section 4 provides some general descriptive statistics of the sample firms and concludes.

2 The IfK-CFS Research Project „Credit Management“

It is the objective of the research project on „Credit Management“ to provide a systematic description and analysis of how commercial banks in Germany arrive at their initial credit decisions and carry out the subsequent processes of borrower monitoring. The analysis focuses on information production and processing during an ongoing bank-borrower relationship. We expect our results to provide an improved foundation for future developments in the field of credit relationships and credit risk management.

The empirical analysis, like the overall project design, is the result of a cooperation between four academic research teams and five leading German universal banks. The participating banks are Bayerische Vereinsbank, DG Bank, Deutsche Bank, Dresdner Bank and West LB. This group of institutions represents a cross-section of the German banking system, comprising as it does the three largest private-sector banks, the apex cooperative bank and the largest apex savings bank.

Both the research project’s objectives and the specific research design were jointly developed by the research teams and the participating banks. The project is divided into several sub-projects. The following issues are being examined:

- **Credit Risk Measurement**: A survey of the applied credit rating systems and scoring techniques of the participating banks [see Brunner/Krahnen/Weber (1998)].
- **Credit Rating Evaluation**: The credit rating systems are empirically analyzed with respect to issues of rating migration and path dependency [see Krahnen/Vossmann/Weber (1998)].
- **Relationship Lending**: A direct comparison between „house banks“ and „normal“ banks as regards their credit policy is provided with respect to loan pricing and contract adjustments subsequent to a change in borrower quality [see Elsas/Krahnen (1998)].
- **Determinants of Bank Loan Performance**: Empirical identification of determinants of the financial performance of bank lending with respect to loan pricing and the occurrence of financial distress [see Ewert/Schenk (1998)].
- **Bank Behavior Based on Internal Credit Ratings**: Static and dynamic analysis of bank loan term adjustments to rating categorization and rating transitions [see Machauer/Weber (1998)].

- **Credit Securitization and Credit Derivatives**: Identification of incentive-compatible structures to enable the securitization of middle market loan portfolios [see Henke/Burghof/Rudolph (1998)].

3 Data collection

3.1 Point of departure

After defining the various research projects the research team and the banks' experts designed the process of data collection.

Five members of the research team, i.e. one person per bank, were in charge of the data collection. During the period of data collection between January and May 1997, a steady communication between the collectors guaranteed a uniform and standardized collection procedure. In addition, one staff member at each bank was responsible for providing support.

The data collection process can be divided into three steps:

- Definition of the population.
- Drawing of the sample.
- Collection of the sample data set

These steps are discussed in the following three sections.

3.2 Definition of the population

As a first step two head offices of each bank were randomly selected. As a second step the particular population members were collected. These had to match four selection criteria:

- The population was restricted to borrowing firms with a turnover (annual sales volume) of between DM 50 million and 500 million.[7] Firms in this size segment are usually classified as medium-sized. In the recent theoretical and empirical literature, the concepts of asymmetric information and incomplete contracts serve as the main tools for analysis of debt contract design or the existence of financial intermediaries.[8] Due to the absence of surveillance by rating agencies and the lack of rigorous disclosure requirements, the degree of informational asymmetry between lenders and borrowers seems to be particularly high where firms of this size are concerned. We would therefore expect them to be a prime subject for analyzing these issues.[9]

[7] This criterion had to be met once during the five-year observation period. The only exception to this rule was that in the population for sample B (see below) the lower limit was reduced to DM 10 million if the number of firms that fell into the appropriate category was not sufficiently large.
[8] For a comprehensive overview of the literature on financial intermediation see Thakor (1995) and Bhattacharya/Thakor (1993).
[9] See e.g. Peterson/Rajan (1994), pp. 3-6. An illustration is provided by Berlin (1996).

- The borrowers each had to have borrowed a total of at least DM 3 million from the respective bank. This criterion guarantees a minimum level of information on the borrower's total debt. According to Section 14 of the German banking law (KWG) commercial banks are obliged to submit quarterly reports to the Bundesbank (German Central Bank) on each borrower with an actual debit balance of DM 3 million or more. The Bundesbank, on behalf of the regulatory agency (BAKred) collects these reports and produces a consolidated statement for each borrower. These statements include the number of reporting banks and are in turn accessible by all reporting banks.
- Borrowers located in the new *Länder* were excluded from the population to avoid special influences due to the industrial restructuring of the former East Germany.
- The borrowers had to have received at least one long-term investment loan from the respective bank, so that at least one loan with a fixed interest rate and repayment schedule and/or a fixed maturity could be observed for each firm.

To avoid a survivorship bias, the population had to include all borrowers who matched the four criteria at some time during the whole observation period, i.e. not only those observed or documented at the end of it. A survivorship bias describes an undesirable influence on the population structure due to a systematic exclusion of defaulted borrowers from the analysis. However, for most banks it was impossible to produce a historic list of customers matching the selection criteria. Thus, in the absence of a historically restricted borrower population, the survivorship bias was minimized by implementing the following process. The current borrower population as of January 1997 served as a starting point. To this basic population were added those borrowers which were on a portfolio or watch list during the observation period between January 1992 and January 1997. As a result, borrowers which met the four criteria but defaulted during the observation period were included in the population at least with a high probability.

3.3 Drawing the sample

We obtained a total sample of 200 borrowers, consisting of 40 borrowers per bank. The samples of each bank were drawn in the same way. As a first step, employing an appropriate random procedure, a sample of 25 borrowers was drawn. We call this representative sample A, where all types of debtors (meeting the four selection criteria) could have been included. The remaining cases in the population were divided into a subset consisting of borrowers with a negatively rated quality at least once during the observation period. In our view, these borrowers represent potentially distressed firms. Thus, drawing a sufficient number of creditors out of this subset should enable us to analyze bank behavior and debt contract

design in financial distress. For each bank, 15 cases were drawn from this subset of the population, thereby artificially increasing the number of observations of distress cases to provide sufficient observations for an empirical analysis of financial distress. Consequently, we label these cases as sample B. Note that in principle,[10] each of these cases meet the same selection criteria as those of sample A. However, the stratification procedure renders both samples incompatible (one is representative, the other is not) and empirical analyses must therefore be carried out separately for each sample.

3.4 Sample data collection

After defining the population and drawing the sample the data were collected. The complete credit files of each borrower served as the basis for the sample data collection, complemented by additional information, as provided by the various electronic data processing systems of the respective bank.

The data was observed for a period of five years from January 1992 until the beginning of the data collection in January 1997 (observation period). For each borrower in the sample all variables of interest (see the data collecting scheme in appendix 3) were collected if a credit decision or rating exercise was documented during the observation period. Thus, for example, for a credit relationship with six documented credit decisions and one additional rating exercise, there are seven observations for each of the (roughly 130) variables.

3.5 Standardization

The research project was carried out in cooperation with five German banks. Therefore, it was necessary to standardize the collection of the relevant data from the documents. In addition, it was necessary to standardize those operating procedures specific to the individual financial institutions.[11] As the data was collected simultaneously by five different persons, the research teams had to agree ex ante on an unequivocal procedure and an unequivocal definition of the information to be acquired, in order to obtain a consistent data set in the end. Moreover, for the same reason, the researchers had to standardize certain data after they were collected. The most important and intuitive example for the necessity of such an ex post standardization are the rating data collected. Each bank employs a different rating system. Only after this

[10] As noted in the preceding section, the turnover criterion was lowered for the corresponding population subset of sample B if the overall number of cases was too small. Hence, the sample includes ten borrowers with a sales volume of between DM 10 and 50 million. These ten borrowers are part of the borrower portfolio of Bank No. 2.
[11] For example, different definitions of terms, operational sequences and systems for categorizing documents had to be taken into account.

information had been translated into a uniform rating code was the information on borrower quality usable in a joint empirical analysis of all firms. The adjustments that had to be made in order to solve these problems are illustrated below:

- **General remarks:** The collection scheme resulted from the comparison between research relevant information and available information. Due to organizational and time constraints, the number of examined main offices per bank had to be limited to two.
- **Pre-Testing:** Prior to the execution of the data collection, the questionnaire was fine-tuned to the bank-specific characteristics and term definitions by running an exploratory survey using examples from each of the five banks.
- **Financial statements data:** In general, the information collected for the relevant financial statements data came from two sources: First, the balance sheets of the borrowers, and second, the interpretations of these statements by the credit divisions. To ensure that influences due to different definitions, transfer errors and bank-specific interpretations were excluded from the analysis, the information was taken directly from the original financial statements. Bank-internal data were used only for the acquisition of financial statement ratios. This procedure allows for an unbiased analysis of the balance sheet data as well as for comparison of bank-specific procedures in this area.

- **Rating systems:** The different internal rating systems of the five banks do not allow for a homogenous assessment of borrower quality. Therefore, the individual rating systems had to be translated into a standardized rating scheme. The result of this translation is shown in table 1. The dotted line between rating 4 and rating 5 indicates the separating criterion used to discriminate between the A and B populations (see section 3.2). Appendix 1 illustrates the rating systems of the five banks as well as the translation mechanism in greater detail.

Table 1

Standardized Rating System

Rating category	Credit standing
1	very good
2	good, above average
3	average
4	below average
5	problematic borrower
6	loan in danger; loss of loan

- **Availability of rating data:** The desired rating-information was not available for all cases. Bank 4 did not start using a rating system based on code numbers until January 1, 1993. Banks 3 and 5 attributed partial ratings based on code numbers during the entire time period examined. In the cases of banks 3 and 4 an attempt was made to transform verbal

assessments of the debtor to the bank-specific rating system. Obviously, this evaluation also reflects the subjective assessment of the person conducting the survey and, thus, does not necessarily reflect the evaluation of the bank, whereas this discrepancy does not exist in the other cases.

- **Lines of business:** The branch of industry to which a given borrower belongs was noted during the process of data collection. This information was taken from the respective credit and monitoring forms contained in the credit files. The bank-specific information concerning the branch was systematically classified according to an internationally recognized system, „Anwendung der Klassifikation der Wirtschaftzweige, Ausgabe 1993 (WZ 93)“, published by the German Federal Statistical Office. WZ 93 uses a hierarchy of five different levels. The higher the level, the more precise the description of the main activity is. The classification according to the second-lowest level would seem to be sufficiently precise for the purposes of this research project. At this level the identification of the activity of a firm is given by a two-digit code number. In the final data record these two-digit numbers were used as uniform branch code numbers.

3.6 Data sheet

The data sheet we used for the collection was divided into three main sections. These sections included seven parts in all. In section 1 (part 1) the general characteristics of the borrower were recorded, e.g. legal form, branch, length of the bank-customer relationship, number of bank relationships and presence of a bank employee on the borrower’s supervisory board. To guarantee the anonymity of their customers there was an agreement with the participating banks to record neither the names nor the (bank-internal) customer codes of the borrowers. Instead, the borrower files where numbered sequentially. An ex post identification of the bank customers after data collection is therefore feasible only with the aid of conversion lists containing the sequential numbers and corresponding customer codes. These lists are held by the banks.

Parts two to six (section two of the data sheet) contain specific information concerning each lending relationship. A description of the credit relationship as a whole, especially the size and the terms and conditions of current or new loans as specified in the contracts, formed the core of parts two and three. To arrive at a figure for total debt, we recorded the total contractually specified credit volume as well as the corresponding disbursements by the given bank, as well as the total debt supplied by all of the banks with which the firm has a credit relationship. The latter information was either based on the reports submitted to the regulatory authority under Paragraph 14 of the German banking law, or on superior internal information provided by the banks in question. Total debt was divided into five different types of credit for which detailed information on volume, interest rate, reference rate, repayment schedule and maturity were

collected. The five categories differentiated between lines of credit („Kontokorrentlinien“), investment loans with fixed maturity and/or principal and interest rate payment schedules („Investitionsdarlehen“), guaranties („Avalkredite“), loans with underlying drawn bills („Wechseldiskontkredite“) and finally an undefined category „other“.

The fourth part of the data sheet contains information about the collateralization of the loans. Four kinds of collateral were differentiated (mortgages, real rights, personal guaranties and covenants). For each of these categories the bank-evaluated monetary equivalent was recorded. This enabled us to calculate the fraction and amount of unsecured credit.

Part five contains information about the evaluation of the borrower’s credit risk and creditworthiness. Mainly, these data are ratings of overall quality and of sub-categories like financial situation, market position and management quality. Additionally, data on current account flows and on financial products combined with loans to attenuate interest rate risks were obtained. The second section consists of information on the occurrence of financial distress on the part of the borrower and actions taken to remedy the situation (part 6). The main intention here was to document a variety of measures available to the bank, ranging from initial limitations or modifications to the exposure at one end of the scale to forced restructuring or bankruptcy at the other.

The data sheet ends with a third section (part 7) which contains some important data taken from the firms’ annual reports or balance sheets, and typical indicators such as financial ratios.

Depending on the type of information requested (qualitative or quantitative) a yes-or-no indication, numerical or alphanumerical values or text had to be entered into the data sheet. Every data field required a specific type of information. This convention allows for systematic data processing and data analysis at a later stage. As a consequence, some of the original data had to be aggregated, interpreted or used as a basis for further calculations in order to yield the information relevant for the data sheet.

The data were usually gained directly from the credit files at the credit offices of the participating banks. In some cases it was necessary to use additional resources, e.g. reports from other offices or from computerized databases. A stylized reprint of the data sheet can be found in appendix 3.

3.7 House bank questionnaire

The research project on relationship banking required additional information on whether the debtor under consideration was a „house bank“ customer of the bank or not.[12] Therefore, a separate questionnaire was sent to the credit office responsible for the custodial service and, thus, the one which has the most intensive contact with the borrower. The employees at the office were instructed to mark a yes-or-no field and provide a brief account of the reasoning behind their assessment. A reprint of the house bank questionnaire can be found in appendix 3.

4 Descriptive Statistics of the Data Set

4.1 Legal forms

With respect to the legal forms of our sample firms, an analysis shows that 42% of the firms were limited partnerships with a limited liability corporation as a personally liable partner (GmbH & Co. KG), 33% were organized as limited liability corporations (GmbH) and 12% as stock corporations (AG) whereas limited partnerships (KG) accounted for only 5%, partnerships (OHG) for 1%, cooperatives (Genossenschaften) 4% and sole proprietorships (Einzelunternehmen) 3%. The following Table 1 and Figure 2 give a detailed survey of the absolute and relative frequency distribution.

Table 2

Frequency Distribution of Legal Forms

Legal forms	Number	%
AG	24	12
GmbH	66	33
OHG	2	1
KG	10	5
GmbH & Co. KG	84	42
Genossenschaften	8	4
Einzelunternehmen	6	3
Total	200	100

[12] See Elsas / Krahnen (1998) for details.

Figure 1

Frequency Distribution of Legal Forms

Analyzing the legal forms of the sample firms raises the question of whether the frequency distribution in the data set is representative for the German corporate system. Therefore, we compared the distribution of legal forms among our sample firms with the distribution of legal forms for all German firms with a sales volume in excess of DM 50 million. The comparative data set was derived from a set of sales tax statistics which differentiates between firms according to their size and legal form.[13]

For this comparison some adjustments were necessary:

- For the sample firms, legal forms as of 1992 rather than current ones were used, since the comparative data set was also collected in 1992. Due to the small number of changes between January 1992 and January 1997 there are only negligible discrepancies vis-à-vis the above analysis.
- Cooperatives were not considered since these are not included in the comparative data set.
- OHGs, KGs and GmbH & Co. KGs were aggregated under the general term „partnerships“ (Personengesellschaften).

Additionally, it should be noted that the comparative data set was not subject to an upper limit on sales volume, whereas our sample has a cap at DM 500 million. Therefore, we would

[13] See Statistisches Bundesamt [*German Federal Statistical Office*] (1994).

expect the share of Kapitalgesellschaften (corporations), i.e. AGs and GmbHs, to be higher in the comparative data set because the proportion of Kapitalgesellschaften is in general higher in the category of firms with a sales volume of more than DM 500 million.

The comparison led to the following results:

Table 3
Distribution of Legal Forms

	Firms with a sales volume > DM 50 million		Firms included in the data set (DM 50 million < sales volume < 500 DM million)	
	Number	%	Number	%
AG and KgaA	791	7	20	10
Limited Liability (GmbH)	4534	40	67	35
Partnerships	5720	50	99	52
Sole Proprietorships	343	3	6	3
Total	11388	100	192	100

The share of sole proprietorships exactly matches the representative numbers. In addition, the fraction of partnerships is negligibly higher whereas the proportion of GmbHs is slightly lower in our data set. Surprisingly, the share of AGs in our data set is higher than for the overall German corporate system.

To summarize, the comparison shows that our data set tracks the frequency distribution of the legal forms of (at least) medium-sized German firms quite well. Thus, the data set seems to be representative in this respect.

4.2 Industry classification

The following figures depict the frequency distribution of sample firms by industry classification. Figure 2 shows absolute frequencies by industry branch. Most firms in our sample (69.5%) belong to the manufacturing industry. Figure 3 breaks down the percentage distribution of the manufacturing portion of our sample in more detail.

Figure 2

Absolute Frequencies of Industrial Branches

Figure 3

Relative Frequencies of Manufacturing Firms

4.3 Firm size

In order to obtain an overview of the size of the sample firms, they were next grouped into various turnover categories. Table 4 lists the average turnover per year from 1992 to 1996. Figure 4 illustrates the number of firms in a given turnover category per year. With the exception of the turnover category „DM 0 to 50 million“, only minor structural changes in the five-year period were observed. That some firms fall into the „DM 0 to 50 million“ and „more than DM 500 million“ categories is primarily explicable by the fact that firms had to meet the sample turnover criterion of DM 50 to 500 million in only one of the years in question, whereas for the other years the turnover could be outside these limits. Finally, figure 5 shows that the majority of our sample firms were at the lower end of the DM 50 to 500 million range. For example, in 1996, 71% of the sample firms had an annual turnover of less than DM 250 million.

Table 4

Average Annual Turnover from 1992 to 1996

Year	1992	1993	1994	1995	1996
Mean turnover [in DM million]	162,554	152,714	161,418	170,658	180,801

Figure 4

Absolute Frequency of Turnover in each Category from 1992 to 1996

Figure 5

Relative Frequency of Turnover in each Category in 1996

[DM million]

4.4 Credit volume

In this section we analyze the total volume of credit supplied to borrowers by the respective bank. First, absolute lending volume was examined. Table 5 lists the average credit volumes from 1992 to 1996. Figure 6 illustrates how the number of firms in given volume categories changed over time. Figure 7, which shows the percentage distribution of the categories in 1996, proves that the majority of the firms (72%) had a bank-specific total credit volume of less than DM 20 million.

Table 5

Average Lending Volume from 1992 to 1996

Year	1992	1993	1994	1995	1996
Mean lending volume [in DM million]	17,967	13,916	16,894	13,916	17,967

Figure 6

Absolute Frequency of Lending Volume from 1992 to 1996

Figure 7

Relative Frequency of Lending Volume in 1996

[DM million]

In spite of the limitation of the analysis to firms with an annual turnover of between DM 50 and 500 million, there was considerable size variation within these limits. Therefore we not only considered the lending volume in absolute terms but also the percentage share of the respective bank in the total financing of a firm (lending volume * 100 / balance sheet total). Table 6 shows the mean values of this ratio from 1992 to 1996. Figure 8 illustrates that the composition of the different categories hardly changed over time.

Table 6

Average Share of the Respective Bank in a Firm's Total Financing

Year	1992	1993	1994	1995	1996
Average share of the respective bank in total firm financing [%]	21.8	20.5	20.4	19.9	20.0

Figure 8

Frequency of Categories from 1992 to 1996

4.5 Ratings

The credit rating systems of the different banks were, as mentioned above, translated into a universal scheme with categories from one to six.[14] In the following, the frequency

[14]See section 3.3.

distributions of ratings of representative sample A firms and sample B firms (potentially distressed firms) are illustrated and interpreted. The borrowers in sample A are referred to as „normal“ because they usually service their debts on time, whereas the borrowers in sample B are termed „problematic“.

Figure 9 shows the frequency distribution of the normal borrower credit ratings in 1996. Table 7 adds the exact numbers. The largest sub-group among these borrowers (52 of 116 with valid credit rating data) were rated three, followed by borrowers with a rating of four and those with a rating of two. The average rating („Mittel“) of 3.1 confirms this observation. The corresponding standard deviation („Std.abw.“) of 0.89 provides further evidence of the fact that middle-range credit ratings are dominant. The density function of the normal distribution (the broken line in figure 9) can be used as a benchmark.

The figures underlying the credit rating frequency distributions from 1992 to 1995 are provided in appendix 2. They yield similar, approximately normal curves.

Figure 9

Credit Rating Frequency Distribution of Normal Borrowers in 1996

Table 7

Credit Rating Frequency of Normal Borrowers in 1996

credit rating	frequency	percentage	valid percentage
1	4	3.4	3.5
2	24	20.2	20.7
3	52	44.4	44.8
4	31	26.1	26.7
5	5	4.2	4.3
6	0	0	0
not valid	3	2.7	---
total	119	100.0	100.0

One would expect to find problematic borrowers primarily in rating categories five and six. However, since the criteria for the B population demanded only one bad rating during the observation period, it was quite possible to find sample B borrowers rated other than five or six. Hence, the number of borrowers with a rating better than 5 turned out to be reasonably large, though the majority of the firms were indeed rated 5 or 6. Figure 10 and table 5 provide an overview for the year 1996. Similar figures and tables for 1992 to 1995 can be found in appendix 2.

Figure 10

Credit Rating Frequency Distribution of Problematic Borrowers in 1996

Table 8

Credit Rating Frequency of Problematic Borrowers in 1996

credit rating	frequency	percentage	valid percentage
1	0	0	0
2	1	1.4	1.5
3	3	4.0	4.5
4	16	21.6	24.2
5	29	39.2	44.0
6	17	23.0	25.8
not valid	8	10.8	---
total	74	100.0	100.0

4.6 Financial distress

In the following, borrowers are defined as financially distressed if banks have planned or taken remedial action with respect to the design of the overall credit relationship. This includes actions such as reorganization, realization of certain collateral claims, termination of the credit relationship, enforcement of bankruptcy procedures, or value adjustments.

Consequently, not all firms in our sample B would be expected to be financially distressed. Recall that this sample was drawn from among firms which were given a low rating (5 or 6) at least once during our observation period. Since a low rating is an imperfect indicator of financial distress, sample B firms are only potentially distressed. Furthermore, sample A borrowers may also be in financial distress as type B borrowers are a subset of type A borrowers.

In representative sample A, only one firm was involved in a reorganization procedure. Additionally, several collateral claims were realized. In the case of another borrower a bank planned to initiate a reorganization.

Sample B, the problematic borrowers, contains 45 out of 74 firms found to be financially distressed as defined above. 26 out of these 45 were involved in reorganization procedures. In one of these 26 cases collateral claims were realized. For another seven out of the 45 distressed borrowers the bank thought about winding up the relationship. In one of the 45 cases only some collateral claims were realized. Eleven out of 45 borrowers were awaiting one of the remedial actions mentioned above. In six of these cases a value adjustment had taken place.

The other 29 out of 74 problematic borrowers were not financially distressed in terms of our above definition. Figure 11 illustrates the breakdown of problematic borrowers as explained above.

Figure 11

Measures for Problematic Borrowers in Financial Distress

Appendix 1: Rating Systems of Participating Banks

All ratings do not reflect collateralization and are, thus, measurements of creditworthiness rather than exposure. Terms in parentheses reflect the qualitative description as used by the corresponding bank.
The double spaced line between ratings 4 and 5 (standardized system) indicates the selection criterion for population B.

Standardized Rating System (Creditworthiness)	**Bank 1 Rating System *** (Creditworthiness)	**Bank 2 Rating System I **** (Credit Risk)	**Bank 2 Rating System II **** (Creditworthiness)	**Bank 3 Rating System** (Credit Risk)	**Bank 4 Rating System** (Creditworthiness)	**Bank 5 Rating System** (Creditworthiness)
1 (very high)	1 (very high)	a (low)	a+, a (very high)	1 (very low)	1 (very high)	1 (very high)
2 (high; above average)	2 (high)	b+ (highly reasonable)	a-, b+ (very high to high)	2 (low)	2 (high)	2 (high)
3 (average)	3+ (average, tending upwards)	b- (reasonable)	b, b- (high to average)	3 (slightly increased)	3 (satisfactory)	3, 3/4 (satisfactory; adequate)
4 (below average)	3- (average, tending downwards)	c+ (high, just reasonable)	c+, c (risky)	4 (strongly increased)	4, 5 (adequate; sufficient, weak)	4 (adequate)
5 (problem case)	4 (poor)	c- (very high, speculative)	c- (extremely risky)	5 (very high)	6, 7 (monitoring necessary; unsatisfactory)	4/5, 5 (just acceptable; poor)
6 (highly distressed; defaulted)	5 (latent, acute risk of default)	d (no longer acceptable)	d (impending bankruptcy)	6, 7 (provision for risk, refinance; liquidation)	8 (desolate)	6 (very poor; default)

* Bank 1 does not subdivide rating 3 into *3+* and *3-*. This differentiation was introduced by us for the translation process and is based on a subjective assessment by the person conducting the survey in this case.
** The presentation of two different rating systems for bank2 is due to a modification of its rating system during the observation period.

Appendix 2: Frequency Distributions of Credit Ratings 1992 – 1995

Appendix 3: Data Sheet

Part 1: General Description of Borrower

lfd Nr	Feldname	Datum	Art d. Angabe	Fundort	Erläuterungen
1	Bank		Kurztext		Name der Bank
2	Datum der Vorlage		Datum	KA-Vorlage	
3	Lfd. Nr. des Datensatzes		Alphanum.	KA-Vorlage	Zur Anonymisierung keine Angabe des bankinternen Ordnungsmerkmals
4	Rechtsform		Auswahl	KA-Vorlage	AG/KG/GmbH/etc.
5	Branche		Alphanum.	KA-Vorlage	lt. Angabe in KA-Vorlage
6	Verbundunternehmen?		Auswahl	KA-Vorlage	Konzern/K.-Teil/Unabh.
7	Vorlagen-Typ		Auswahl	KA-Vorlage	Kredit/Überwach./Sonst
8	Vorlagen-Grund		Textfeld	KA-Vorlage	Engagementänderung (welche)?
9	Kunde seit		Numerisch	KA-Vorlage	
10	Kreditnehmer seit		Numerisch	KA-Vorlage	
11	Anzahl Bankverbindungen		Numerisch	Mio-Kreditm.	Soweit verfügbar
12	Ist die Bank die Hausbank des KN?		j/n	KA-Vorlage	wenn ersichtlich
13	Wird eine Konten-/Kundenkalkulation durchgeführt?		j/n	Kredit-Abt.	
14	Erfolgswert aus KuK-Kalkulation		Kurztext	Kredit-Abt.	z. B. Ertrag, Kosten oder Saldo (nur wenn 13)
15	Vertretung des KI im AR/Beirat		j/n	KA-Vorlage	
16	Wenn ja, Vorsitz im AR/Beirat		j/n	KA-Vorlage	nur wenn 15 = ja
17	Cross-Selling-Argumente?		j/n	KA-Vorlage	
18	Sind allgemeine Covenants vereinbart, die sich nicht auf einen bestimmten Kreditvertrag, sondern auf die gesamte Kundenbeziehung beziehen?		Kurztext	KA-Verträge	Bsp.: Negativerklärungen, Ausschüttungsrestriktionen, Einhaltung v. Bilanz-kennzahlen, etc. hier nur allg. C. angeben.

Part 2: Credit Relationship: Overview and Categories

	Feldname	Datum	Art d. Angabe	Fundort	Erläuterungen
34	**Engagement-Beschreibung**:				
35	Gesamt-Obligo des KN bei KI		Numerisch	Mio-Kreditm.	evtl. berechnen
36	Gesamt-Obligo bei allen KI		Numerisch	Mio-Kreditm./ KA	höheres
37	Inanspruchn. des Ges.-Obligo % bei		Numerisch	KA-Vorlage	evtl. berechnen
38	Art der Änderung		Textfeld		z.B.Änderung der
39	**Kontokorrentkredite:**				
40	Zugesagte Linie		Numerisch	KA-Verträge	0, wenn keine Linie
41	Vereinbarter Zins %		Numerisch	KA-Verträge	0, wenn keine Linie
42	Marge		numerisch	KA	Angabe, berechnen
43	Linie zuletzt vereinbart am		Datum	KA-Verträge	
44	Inanspruchnahme des KKK %		Numerisch	Kontenübers.	evtl. berechnen
45	**Avalkredite:**				
46	Zugesagte Linie		Numerisch	KA-Verträge	0, wenn keine Linie
47	Vereinbarter Zins %		Numerisch	KA-Verträge	0, wenn keine Linie
48	Linie zuletzt vereinbart am		Datum	KA-Verträge	
49	Inanspruchnahme v. Avalkrediten %		Numerisch	KA-Vorlage	evtl. berechnen
50	**Wechseldiskontkredite:**				
51	Zugesagte Linie		Numerisch	KA-Verträge	0, wenn keine Linie
52	Vereinbarter Zins %		Numerisch	KA-Verträge	0, wenn keine Linie
53	Marge		num.	KA	Angabe, berechnen
54	Linie zuletzt vereinbart am		Datum	KA-Verträge	
55	Inanspruchnahme von WDK %		Numerisch	KA-Vorlage	evtl. berechnen
56	**Sonstige Kredite**				
57	Art		Textfeld	KA-Vorlage	
58	bewilligte Höhe		numerisch	KA-Vorlage	
59	vereinbarter Zins		num	KA-Vorlage	
60	Marge		numerisch	KA-Vorlage	wenn sinnvoll
61	Inanspruchnahme				

Part 3: Long-Term Investment Loans

	Feldname	Datum	Art d. Angabe	Fundort	Erläuterungen
19	Kreditart		Auswahl	KA-Verträge	Annuität / konstante Tilgung / Endfällig / Sonst
20	Nennbetrag		Numerisch	KA-Verträge	
21	Restbetrag		num.		
22	Disagio		Numerisch	KA-Verträge	0, wenn keines
23	Effektivzins %		Numerisch	KA-Verträge	soweit verfügbar
24	Vereinbarter Zins %		Numerisch	KA-Verträge	
25	Festzins?		j/n	KA-Verträge	
26	Zins zuletzt vereinbart am?		Datum	KA-Vorlage	
27	Laufzeit		Numerisch	KA-Verträge	
28	Vereinbarte Zinsbindungsdauer		Numerisch	KA-Vorlage	0, wenn keine
29	Anfängliche Tilgung %		Numerisch	KA-Verträge	wenn 19 ungleich Endfällig
30	Annuität (Höhe)		Numerisch	KA-Verträge	wenn 19 = Annuität
31	Name des Referenz-Zinssatzes für 23/24		Textfeld	KA-Verträge	wenn angegeben
32	Kreditbeschreibung		Kurztext	KA-Verträge	sofern nicht durch obige Felder erfaßbar; z. B. nicht in der Liste enthaltener Referenzzins
33	Sind Covenants vereinbart (spezifisch für langfristige Inv.-Darlehen)?		Kurztext	KA-Verträge	wenn nicht unter Nr. 18

Part 4: Collateral

	Feldname	Datum	Art d. Angabe	Fundort	Erläuterungen
84	Haftungszusage verbundener Unt.?		j/n	KA-Vorlage	
85	Sicherheitenpool?		j/n	KA-Vorlage	
86	Ist Bank Führer dieses Pools?		j/n	KA-Vorlage	nur wenn lfd 85 = ja
87	Grundpfandrechte vorhanden?		j/n	KA-Vorlage	
88	Bewertete Höhe von 87		Numerisch	KA-Vorlage	Keine %-Angaben!
89	Andere dingliche Sicherheiten vorhanden?		j/n	KA-Vorlage	z. B. Sicherungs-Übereignung, Mobiliar-Sicherheiten
90	Bewertete Höhe von 89		Numerisch	KA-Vorlage	s. lfd. 88
91	Persönliche Sicherheiten vorhanden?		j/n	KA-Vorlage	z. B. Bürgschaften, Garantien, Patronatserklärungen
92	Bewertete Höhe von 91		Numerisch	KA-Vorlage	s. lfd. 88
93	Negativklauseln vorhanden?		j/n	KA-Vorlage	
94	Blanko-Anteil %		Numerisch	KA-Vorlage	0, wenn keiner
95	Sonstiges		Textfeld		bei Bedarf (z.B. Rangrücktritt bei Gesellschafterdarlehen etc.)

Part 5: Borrower Quality

	Feldname	Datum	Art d. Angabe	Fundort	Erläuterungen
96	Gesamt-Beurteilung des KN		Kurztext	KA-Vorlage	mit Berücksichtigung der Sicherheiten
97	Gesamt-Beurteilung des KN vor Sicherheiten		Kurztext	KA-Vorlage	ohne Berücksichtigung von Sicherheiten. Angabe nur wenn aus der KA-Vorlage ersichtlich
98	Gesamt-Beurteilung der Branche		Kurztext	KA-Vorlage	
99	Gesamt-Ratingkennzahl des KN		Alphanum.	KA-Vorlage	
100	System-Rating des KN?		j/n	KA-Vorlage	
101	Gesamt-Ratingkennzahl des Kredits		Alphanum.	KA-Vorlage	soweit verfügbar
102	Teil-Ratingkennzahl für Marktstellung des KN		Alphanum.	KA-Vorlage	
103	Teil-Ratingkennzahl für Finanz- & Ertragslage des KN		Alphanum.	KA-Vorlage	
104	Teil-Ratingkennzahl für das Management des KN		Alphanum.	KA-Vorlage	
105	Teil-Rating für das Management des KN		Kurztext	KA-Vorlage	
106	KKK-Analyse durchgeführt?		j/n	KA-Vorlage	
107	Durchschn. KKK-Umsatz		Numerisch	EDV-Abfrage	nur wenn 106 =ja
108	Anteil ∅ KKK-Umsatz am Gesamtumsatz des KN %		Numerisch	EDV-Abfrage	s. 108
109	hoher Auslandsanteil an Firmengeschäft?		j/n	KA-Vorlage	wenn vermerkt
110	Geschäftsrisikobezogene Finanzgeschäfte.		Auswahl 0-3	KA-Vorlage	Hedge-Geschäfte, wenn vermerkt (keine (0), Währungs(1)-, Zins-(2), sonstige Preisrisiken(3))
111	geogr. Geschäftsfeld		1-4	KA-Vorlage	regional (1), Bundesland (2), bundesweit (3), international (4)

Part 6: Information on Financial Distress

	Feldname	Datum	Art d. Angabe	Fundort	Erläuterungen
112	Änderung des Engagements?		j/n	KA-Vorlage	nur wenn ja: Nr. 113-123
113	Grund/Auslösendes Ereignis		Kurztext	KA-Vorlage	
114	Datum des auslösenden Ereignisses		Datum	KA-Vorlage	soweit greifbar
115	Form der Begrenzung:				
116	Reduzierung einer o. mehrerer Linien		j/n	KA-Vorlage	
117	Einforderung einer zusätzlichen Besicherung		j/n	KA-Vorlage	Besicherung vorher un-besicherter Linien
118	Preispolitik		j/n	KA-Vorlage	Konditionen-Anpassung
119	Wechselqualität		j/n	KA-Vorlage	
120	Stundung v. Zins- und/oder Tilgungszahlungen		j/n	KA-Vorlage	
121	Neuverhandlung des gesamten Engagements		j/n	KA-Vorlage	
122	Kündigung/Fälligkeitsstellung des Kredits		j/n	KA-Vorlage	
123	Sonstiges		Kurztext	KA-Vorlage	Stichworte, soweit nicht durch 115-122 erfaßt
124	Problemfall/Sonderbehandlung?		j/n	KA-Vorlage	nur wenn ja: Nr. 125-134
125	Grund/Auslösendes Ereignis		Kurztext	KA-Vorlage	
126	Datum des auslösenden Ereignisses		Datum	KA-Vorlage	soweit greifbar
127	Maßnahmen:				
128	Verwertung von Sicherheiten		j/n	Rev./Contr.	
129	Sanierung		j/n	Rev./Contr.	
130	Abwicklung		j/n	Rev./Contr.	
131	Bankenpool für San./Abwicklung		j/n	Rev./Contr.	
132	Ist die Bank Führer dieses Pools		j/n	Rev./Contr.	nur wenn 125 = ja
133	Wertberichtigung in % des Gesamt-Engagements		Numerisch	Rev./Contr.	ggfs. Ausrechnen

134	Sonstiges		Kurztext	Rev./Contr.	Stichworte, soweit nicht durch 128-133 erfaßt

Part 7: Balance Sheet Data

	Feldname	Datum	Art d. Angabe	Fundort	Erläuterungen
62	Bilanzsumme		Numerisch	Bilanz	
63	kurzfr. Fremdkapital		Numerisch	Bilanz	Vertragslaufzeit <= 1 Jahr und langfr. mit RLZ <=1
64	gesamtes Fremdkapital		Numerisch	Bilanz	alles FK lt. Bilanz
65	Eigenkapital		Numerisch	Bilanz	gez. Kap + Kapitalrücklagen + Gewinnrücklagen + Gewinnvortrag+ Jahresüberschuß
66	Sonderposten mit		Numerisch	Bilanz	
67	Rückstellungen		Numerisch	Bilanz	
68	Mittel- u. langfristige Passiva		Numerisch	Bilanz	Eigenkapital + Pensionsrückstellungen +langfr. FK
69	Liquide Mittel		Numerisch	Bilanz	Kasse, Schecks, Bankguthaben, Wertpapiere des Umlaufvermögens
70	Mittel- u. langfristige Aktiva		Numerisch	Bilanz	Anlagevermögen + Forderungen + sonst. VG mit einer RLZ > 1 Jahr
71	Umsatz		Numerisch	Bilanz	Umsatz
72	Aufwendungen für Forschung und Entwicklung		numerisch	Bilanz	wenn angegeben (Erläuterungen zur GuV, Anhang, Lagebericht)
73	Jahresüberschuß vor Steuern		Numerisch	Bilanz	gemäß GuV
74	Ergebnis der gewöhnlichen		Numerisch	Bilanz	gemäß GuV
75	Zinsaufwand		Numerisch	Bilanz	gemäß GuV
76	Steuern vom Einkommen und		Numerisch	Bilanz	gemäß GuV
77	Abschreibungen		Numerisch	Bilanz	gemäß GuV
78	Zuführung zu Rückstellungen		Numerisch	Bilanz	gemäß GuV
79	Cash Flow		Numerisch	MaBiLa	Keine Berechnungen bei der Eingabe!
80	Eigenkapital-Quote %		Numerisch	MaBiLa	keine Berechnung
81	Verschuldungsgrad %		Numerisch	MaBiLa	keine Berechnung
82	Gesamtkapital-Rentabilität %		Numerisch	MaBiLa	keine Berechnung
83	Anlagen-Deckungsgrad %		Numerisch	MaBiLa	keine Berechnung, wenn beide, I

Appendix 4: House Bank Questionnaire

Questionnaire for Department in Charge

Identification Code:.....

1) In your assessment, is the above mentioned credit relationship a house bank relationship?

☐ Yes ☐ No

2) What are the reasons for your assessment?

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(bank internal department)

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