

From Soft and Hard-Nosed Bankers- Bank Lending Strategies and the Survival of Financial Distressed Firms

Daniel Höwer *

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Abstract

Do private banks act as hard-nosed bankers when firms get financially distressed compared to public banks? It is widely acknowledged that state guarantees give public banks a competitive advantage. Public banks have the mandate to support regional economy and their lending strategy can be seen as somehow fixed financing firms as long as economically reasonable. Private banks are free to choose their lending strategy. They might adopt a credible strategy that liquidates firms early in financial distress. Firms self select according their risk and private banks' risk portfolio improves. If so, financially distressed firms financed by private banks should show a higher probability of exiting the market.

For German firms in the period 2000-2005, I find that the probability leaving the market after financial distress is higher for firms financed by private banks. Private banks seem to be less likely to audit firms in distressed situations or at least adopt stricter rules. While

*Centre for European Economic Research (ZEW), P.O. Box 103443, 68034 Mannheim, Germany. Phone: +49 621 1235-187, Fax: +49 621 1235-170. E-mail: hoewer@zew.de

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there is a broad discussion about public banks in the literature because of governmental influences, the effects of different lending strategies are even larger for cooperative banks.

Keywords: financial distressed firms, public and private banks, relationship lending

JEL Classification: G21, G33, L14

1 Introduction

Relationship building in financial services have many benefits for lenders, borrowers, and the society at large. Young or distressed firms that are assessed to be viable receive finance, and can invest in uncertain but more profitable investments. Banks "*lean against the wind*" and keep with their customers when there are most in need (Petersen and Rajan, 1995). They do so because banks bind their costumers and get inside information. Debt becomes equity-like as the relationship gets closer. That put banks in a better position to extract future surplus from profitable projects. If firms get financially distressed relationship lenders are in a better position for renegotiation. First because they posses priory information about the firms project and second because they are specialized for such cases (Boot and Thakor, 2000).

Although relationship lending can be beneficial for firms, it comes at a cost. Firms are informational locked in and can not easily switch to other financing partners that are less expensive. Low risk firms with more certain but lower profits gain less by relationship lending (Boot and Thakor, 2000). They ask for transaction lending related to lower financing costs.

Public banks can be said to act as a relationship lender. Public banks have a mandate supporting regional economic development (Baas and Schrooten (2005), e.g. article 6 SpG (2005)). To do so, owners grand additional payment that lowers public banks' funding costs. Private banks acting in a competitive market with public banks. Within this environment specialization of private banks as transaction lenders can be a rational strategy. Private banks offer firms a contract with lower interest but rule out any audit and renegotiation in financial distress. Low risk firms self select into that contract and high risk firms keep with savings banks or cooperative banks (Matthey, 2008).

In most cases discounted expected future cash flow after renegotiation is higher than liquidation value (Matthey, 2008). However, if a bank adopts a strategy as a transaction lender but does not behave in that manner high risk firms will free ride. Therefore, transaction lenders need to bind themselves not to renegotiate but liquidate firms in distress. They need to build up reputation as hard-nosed banker.

If private banks adopt a strategy as transaction lender, the probability of their borrowers to leave the market in financial distress should be higher compared to those financed with public or cooperative banks. The possibility to act as a relationship lender depends on further conditions such as the concentration in local banking markets or firms financing structure. This article explores whether the market exit for firms in financial distress depends on bank type.

In Germany, private banks acting in a competitive market with public and cooperative banks. Although public and cooperative banks are organized differently, both have similar aims (Engerer, 2006) and can perform the same functions (Hakenes and Schnabel, 2006). Traditionally, they build up close relationships to their customers and adopt different lending strategies compared to private banks (Engerer and Schrooten, 2004). Private banks can be seen to act more as a transaction based lender. There is anecdotic evidence that private banks act as hard-nosed bankers and are not interested on relationships with especially small and medium sized firms. Hilmar Kopper¹ made an in Germany well known statement that the sum of unpaid bills of failed craft enterprisers are "Peanuts" compared with the banks loss during the "Schneider"-affaire.² Therefore, German banking system seems a good environment to test differences in banks' lending strategy.

Next to banks' strategy firm's market exit depends its financing behavior, internal, and external factors. The sample is restricted to the 2000 - 2005 period since important legislative changes for banks came in power by the end of that period.³ The model controls for serious selection bias concerning

¹From 1989-1997 Mr. Kopper was chairman of the Deutsche Bank AG. He made the statement during press conference at the 24th of April 1994.

²The Deutsche Bank was heavily involved in financing a construction company owned by Mr. Jürgen Schneider. The company modernized historical buildings in city centers, in particular. In order to receive finance, documents and books were manipulated. Information become public and the firm failed in 1994. Total bank debt accumulated to 5.4 bn DEM, around 2 bn DEM financed by the Deutsche Bank.

³Within the transition period from 19.07.2001 to 18.07.2005 Anstaltslast and Gewährträgerhaftung (additional payment of public banks' owners) for savings banks were abolished. Because of grandfathering major change came into place in 2005. Basle II accord came into power at the end of that period via the Bundesamt für Finanzaufsicht letters 34/2002 (minimum standards for credit business), 18/2005 (minimum standards for risk management), and European Union guidelines 2006/48 and 2006/49.

unobserved distress situation of firms survived. I will show that probability of market exit is higher for firms financed by private banks.

The paper is organized as follows: The introduction is followed by a review of the literature concerning relationship lending, and firm survival. Section 3 describes data sources and variables. Since the German “three pillar banking system” is somehow special a brief description of the main differences is provided.⁴ In section 4 the empirical model and results are presented and discussed. Section 5 summarizes the findings and concludes the paper.

2 Relationship Banking and Firm Survival

Diamond and Dybvig (1983) show that financial intermediaries acting as delegated monitors are able to realize economies of scope and scale in obtaining information about borrowers. They have advantages in collecting and analyzing information on investment projects compared to multiple financiers, and reduce costly information asymmetries. Therefore, financial intermediaries allocate capital to profitable investment projects and decide on their liquidation if unprofitable. In a world of asymmetric information complete contracts are not feasible and there may be a need to renegotiate financial contracts. In such a situation long term interaction between borrowers and banks is mutually beneficial (Rajan, 1998).

Ongena and Smith (1998) define “relationship lending” as “the connection between a bank and customer that goes beyond the execution of simple, anonymous, financial transactions.” Maintaining a relationship means making temporary sacrifices in favor of obtaining future benefits. Relationship banking covers multiple ways of how banks obtain information about customers, including all banking services such as cash management, access to the payment system, deposit holding, cross-selling other bank or insurance products etc. (Degryse and van Cayseele, 2000). Without implicit contracts that share intertemporal profits, banks need to break even period-by-period (Petersen and Rajan, 1994, p. 407) and are forced to liquidate unprofitable

⁴A more detailed analysis of the German financial system and the link to corporate finance is provided in Krahen and Schmidt (2004).

investments. That is referred to as “transaction lending”. A firm’s probability to survive a situation of financial distress is therefore affected by the banks’ lending strategy.

Bank’s Lending Strategy Banks benefit from long term relationship strategy, as intertemporal transfers in loan pricing is value-enhancing. Banks learn about the type of the entrepreneur and receive inside information (Petersen and Rajan, 1994; Fama, 1985) while its importance depends on the length of the duration (Ongena and Smith, 1998). Inside debt or equity like finance of relationship lending is underlined by the banks ability to either refuse future lending or to accommodate the firm with new loans, conditional on actions taken by the firm during and after the distress period. Therefore, banks are able to exert control over the firms’ asset management (Ongena and Smith, 1998). Trading partners are willing to accept below cost products, while there is an implicit contract to recover initial losses by future surpluses (Ongena and Smith, 1998). Relationship lenders face a higher liquidation value of provided securities (Diamond and Rajan, 2001*a,b*) and are therefore in a better position when it comes to renegotiation of debt contracts (Boot and Thakor, 2000).

A bank’s lending strategy might be driven by its type, where public banks act as relationship lenders and private banks do not (Baas and Schrooten, 2005). It is often argued that competition in banking is distorted by state guarantees for public banks reducing its funding costs. Public banks have a mandate to provide finance and financial services to the people, companies, and local authorities within the business district supporting regional economic development (e.g. article 6 SpG (2005)). Public banks should keep financing investment projects as long economically justifiable (Matthey, 2008). In other words, public banks strategy space is fixed to those of a relationship lender. Private banks are not restricted to a certain lending policy. Matthey (2008) argues that banks compete in repayment rather than interest streams only. Private banks can offer transaction based lending that rule out renegotiation in financial distress in order to attract low risk firms. The liquidation threat needs to be credible and the private bank act as a hard-nosed banker in order to prevent high risk firms from free riding. Financial distressed firms

financed by private banks should show a higher probability of market exit than those financed by public banks. High risk firms would self select to public banks. In order to test whether differences in the probability of market exit of financially distressed firms exists between bank types further aspects need to be considered.

Banks need to invest in sector specification in order to generate expertise and to add value. Since banks' specification cost is independent from borrowers quality, but rent is a decreasing function of with borrower's quality, costs exceed the marginal benefit at a sufficiently high quality level (Boot and Thakor, 2000, p. 692). Bank's possibility to act as a relationship lender is influenced by banking market competition (Ongena and Smith, 1998; Sharpe, 1990; Rajan, 1992). A monopolistic bank can charge low payments during the period of uncertainty and extract future surpluses. In a competitive banking environment firms with improved quality seek finance from competitors and switch the bank. The incumbent can no longer hold equity like claims and need to break even period-by-period (Petersen and Rajan, 1995). Bank's investment in sector specification critically depends on competition within the banking market and from the capital market. Since interbank competition affects bank's profits from relationship and transaction lending asymmetrically Boot and Thakor (2000) conclude that relationship lending becomes more important but add less value to each loan.

Firms financing behavior Relationship building in lending adds value to borrowers in several dimensions. First, it signals a firms payment condition and credit risk to outside debt holders (Boot, 2000; Fama, 1985). Therefore, the "two audience" signaling problem is reduced and duplication of the evaluation process avoided (Boot, 2000). Second, relationship lending effects financing conditions directly and allows for more flexibility and discretion in project financing (Boot, 2000). Third, young firms gain easier access to finance and banks accept higher risk not asking for full collateral (Petersen and Rajan, 1995). Fourth, banks are more likely to audit and restructure debt of firms in financial distress. Banks provide an insurance in case of sudden and temporary difficulties of their relationship customer (Elsas and Krahen, 1998).

A close relationship adds more value to low and medium quality firms or projects compared to transaction lending (Boot and Thakor, 2000), especially since such a relationship does not come without cost. Information monopoly of relationship banks possess a potential risk on borrowers due to ex post bargaining power (Elsas and Krahnert, 1998; Mayer, 1988; Rajan, 1992). Firms can mitigate the hold up problem by multiple sources of finance such as other financial intermediaries or trade credit. With an increasing number of lenders and decreasing share of financing by a single institution firms face a higher probability of being rationed and it becomes harder to coordinate renegotiation (Thakor, 1996). Asymmetric financing, where the largest share of finance is kept by a single institution and the rest is split over few others, leaves the main bank as the relationship lender and provides sufficient information to other institutions to reduce potential switching costs (Elsas et al., 2004).⁵

Further determinants of firms exit However, firm's probability of a market exit is not only related to its financing behavior. Literature on firm survival identifies internal (firm-specific) and external factors related to the firm's business environment (Manjón-Antolín and Arauzo-Carod, 2008) influencing a firm's probability leaving the market. One stylized fact about entry quoted by Geroski (1995) states that age and size are positively related to the probability of firm survival. Related to age, firms face liability of "newness" (Freeman et al., 1983), "adolescence" (Fichman and Levinthal, 1991), or "senescence" (Hannan, 1998). Recently established firms need time to settle and invest, learn about their ability, and draw from the initial capital. Therefore, failure risk increases over time and reaches a peak. Older firms might be ill-suited for changes in competitive environment (Esteve-Pérez and Manez-Castillejo, 2008). Many studies show inverse u-shaped or other non-linear age effects on firm survival. The firms probability to survive should be positively related to size for several reasons. Small firms face liability of "smallness" (Freeman et al., 1983). Larger firms are better able to diversify and are less prone to shocks in single markets. Those may also be in a bet-

⁵Empirical evidence confirms multiple but few bank relations for German firms (Elsas, 2005; Neuberger et al., 2006).

ter position acquiring capital and labor (Esteve-Pérez and Manez-Castillejo, 2008). Differences in size also reflect differences in efficiency. Larger firms are more likely to produce on their industry minimum efficient scale (Audretsch and Mahmood, 1995) and differ in organizational form and managerial ability (Esteve-Pérez and Manez-Castillejo, 2008). Empirical studies find a decreasing, non-linear size effect on firms failure probability (Esteve-Pérez et al., 2004; Strotmann, 2007).

Harhoff et al. (1998) introduce the firm's choice of liability rules to survival models because the legal form reflects systematic differences in the mode of ownership transfer and the entrepreneurs' assessment of projects riskiness. There are also differences for information disclosure and bankruptcy law. External factors represent specific conditions of the firm's business environment, such as industry and business cycle, influencing a firm's survival function. Industries differ in life cycle, entry and exit rates, industry specific shocks, or capital intensity (Geroski, 1995; Audretsch and Mahmood, 1995; Audretsch, 1995; Harhoff et al., 1998; Agarwal and Grot, 2002; Esteve-Pérez and Manez-Castillejo, 2008).

3 Data

In order to find evidence for different lending strategies of different bank types (private, public, and cooperative banks), the probability of exit of financially distressed firms is estimated. As described in the previous section relationship lending is influenced not only by the banks' type but by financing behavior. In addition, firms characteristics are used to control for internal and external factors influencing the firm's probability of market exit. The empirical analysis is based on the Mannheim Enterprise Panel (MUP) and a bank panel. First, a brief description of the German banking system is given. Second, data sources and the data generating process are described, followed by definitions and descriptive statistics of variables at hand.

3.1 German Banking System

The German banking system consists of three banking sectors, the public, cooperative, and private banking sector. The structure of the German banking system is often described as the “Three Pillar System” (Krahn and Schmidt, 2004; Engerer and Schrooten, 2004, e.g.). Table 2 provides information about the market share of each banking sector and Table 3 provides a list of banks assigned to the above bank types .

Public banks are either savings banks or Landesbanks.⁶ Savings banks are owned by the district or municipality and are therefore decentralized organized. Governments need to credibly promise bail-out of state-owned banks in order to avoid bank runs and owners’ liability for additional payments⁷ was an important characteristic of state-owned banks. Savings banks adopt the regional principal that restrict their operating area to the area of the district or municipality by whom they are owned. By law and individual status public banks have the mandate to provide finance and financial services to the people, companies, and local authorities within the business district supporting regional economic development (e.g. article 6 SpG (2005), Engerer and Schrooten (2004)).

Members of the supervisory board of savings banks are jointly elected by administrative authorities and bank’s staff, while the chair of the board is linked to the position of the district administrator. Therefore, politicians decide on the bank’s strategy, the board of managers and individual substantial financing cases. Landesbanken are jointly owned by savings banks and federal states. The mission of a Landesbank is to support savings banks and municipalities by whom they are owned and are involved in local public business development programs but are also involved in corporate finance directly.⁸

⁶Bank relationships with the Deutsche Bundesbank (no. 1, Table 3) or public development banks (no. 4, Table 3, federal or state owned banks for special purposes) are not considered since these banks do not act as ordinary lenders within the German banking system.

⁷Gewährträgerhaftung and Anstaltslast describe an unlimited cover by the banks owners in case of distress. Additional payment was abolished in 2005.

⁸See e.g. Staatsvertrag über die Bildung einer gemeinsamen Sparkassenorganisation in Hessen und Thüringen, chapter 1 B, article 8.1, 8.3, 8.4, and 9, 2006.

Cooperative banks are owned by individuals that hold cooperative shares, respectively. The purpose of cooperative banks is to promote the acquisition and the business of members (Engerer, 2006). According to cooperative bank's status and mission statement these banks support their members and enhance regional development. Cooperative banks can perform the same functions as public banks (Hakenes and Schnabel, 2006) and their strategy space is equally fixed. Members of the supervisory board are elected by the cooperative members. Votes are often restricted to heads instead of numbers of shares hold by individuals. In case of insolvency members of a cooperative bank are called for restricted but additional.

Private banks are either commercial banks or real-estate credit institutions. mostly, these banks operate in a legal form of a public listed stock company or limited liability. Therefore, owners' liability is limited by their capital contribution. Private banks take decision on commercial basis and are not restricted to a certain lending policy (Engerer, 2006).

3.2 Data Sources

The core data comes from the MUP, maintained by the Centre for European Economic Research (ZEW). The MUP is a firm-level database collected by Creditreform, the largest credit rating agency in Germany. Since 1999, ZEW receives twice a year full back up of Creditreforms data-warehouse of firm-level data and constructs the panel. The database has nearly a full coverage of firms located in Germany. The MUP is based on information, that allows to assess a firm's credit worthiness. Firm information gets updated on an irregular basis. On average, firm information is updated every 9 months. Firm information is collected decentralized by 120 regional Creditreform branches. Even if the investigation procedure applies to certain standards, sources and quality may differ between Creditreform branches (Almus et al., 2000).

Due to the data generating process the MUP database is prone to sample selection. Time between updates and quality of data may differ between both Creditreform branches and firm characteristics. A lack of data quality corresponding to a deterioration state of the mode of payment might lead to a serious sample selection bias. This is the case if the observation of this event

is correlated with the firm's insolvency. In other words, data collector infers from firm insolvency noticed that this firm must have had serious financial difficulties. The chance that a change of the mode of payment is observed for firms that recover after a short period is low.

Due to consolidation in German banking market the number of banks reduced considerably during the sample period. Via bank branches known by the MUP firm-level data is linked to a bank panel that reflect bank mergers between 2000 and 2005.⁹ The bank panel contains information on number of branches, bank type, the bank's business district, and the number of competitors in local banking markets.¹⁰

3.3 Variable Description

3.3.1 Dependent and Restrictive Variables

The empirical model estimates the probability of financially distressed firms in period t to exit the market within a period up to $t + n$ (while $n=0,1,\dots,4$; where n equals 6 months). Due to important changes in banking regulation that came into power in 2005, the sample is restricted to a randomized 10 per cent sub-sample of the total population of economically active, non-financial institutions that became financially distressed in the period between 2000 and 2005. The years 2006 and 2007 are left for the identification of market exit in successive sample periods. Table 5 describes variables used in the model.

Identification of financially distressed firms Identification of financial distress is crucial for the assignment into the sample. Banks gain private information about customers while observing their payment behavior (Ongena and Smith, 1998, p. 6) and are therefore able to detect situations of financial distress. In general, such sensitive information is rarely available for research. As in Kaiser (2001) financial distress is identified if the firm's

⁹Information on bank mergers was provided by: Deutscher Sparkassen und Giroverband for the savings banks; Bundesverband der Volks- und Raiffeisenbanken for cooperative banks; BankScope for private banks.

¹⁰Local banking markets are defined by administrative districts, so called Landkreise or kreisfreie Städte. A bank is assigned to a district if at least one branch is operated.

mode of payment status deteriorate, based on information provided in the MUP. Unlike Kaiser (2001) the characteristics on firms' mode of payment are categorized in five groups¹¹. A decline in the mode of payment status serves as an indicator for financial distress. Firms are selected according to this restriction variable. However, a change from the first to the second category is not considered as financial distress. The overall sample consists of 556,595 firms of which 67,550 firms have become financial distressed. Because firms can face several episodes of financial distress over time a total of 86,564 cases are observed within the relevant period. Due to data limitation for certain variables 67,048 cases are used for the empirical analysis. For robustness checks a change in the firm's creditworthiness, assessed by Creditreform, is used as an indicator of financial distress.

Identification of firms market exit Firms exits serve as a dependent variable. Insolvencies are known since any insolvency proceeding is to make public. Voluntarily exit is considered if recognized by Creditreform. In some cases exit information was adjusted in order to make firm observations consistent. Table 4 presents the number of financial distressed firms, the number of firms having left the market within a two-year-period after facing a financial distress in the given year in absolute terms and relative to the number of firms financed by the bank type, respectively. Comparison of column 4, 7, and 10 shows that firms financed by private banks exit the market more often after financial distress. On average, for 1.89 % of observations per sample period financial distress is observed. In 39.3 % of those cases firms exit the market within four successive sample periods.

3.3.2 Independent Variables

As derived in Section 2, it is assumed that exit of distressed firms depends on the firms banking and finance behavior as well as internal and external

¹¹First, payments without complain where all payments are within time for payment allowed. Second, payments without complain but made later than the date of payment agreed. Third, payments made where the term of credit exceeds more than 30 days or firms have got reminded several times. Fourth, serious delay in payment, e.g. payment is not made within three month, and fifth, no payments made due to insolvency.

factors. Table 5 defines variables and Table 6 presents descriptive statistics of independent variables for financially distressed firms.

In the overall panel for 23.8 % of the firms private banks, for 48.5 % public banks and for 27.7 % cooperative banks are noticed as the main bank.¹² Taken 12 banks active in a local banking market on average concentration is considerably high.

As renegotiation depends on the number and the shares of creditors the model captures two types of information. First, the *Number of Bank Relations* controls for diversity of bank finance. Unfortunately, the share of finance according to the banks is not known. In cases where two or more branches observed belong to the same bank number of branches is reduced. Number of bank relationships are found lower compared to other studies concerning Germany.¹³ Second, there is no direct information about trade credit. However, if credit between firms is sufficiently large and especially in situations of distress, creditors commission debt collectors. Information on Creditreform mandate to collect debt from a particular firm is therefore used as a proxy for sufficiently large outstanding non-bank debt captured by the dummy variable *VC Debt Collection*. It is assumed that banks collateralize any residential, commercial, or mixed property owned by the firm. A quarter of all firms can use *Real Estate* for bank securitization. only few firms face more than one episode of financial distress covered by the variable *History of Distress*.

In line with other studies on firm survival I include several variables grouped as internal factors. Almost a third of all firms are listed in public *Business Register* while most firms are not managed by a *Management Team* but a single entrepreneur. Successful negotiation with claim holders might also be influenced by personal ability that is captured by entrepreneurs' educational background. For 12 % of all firms its known that the highest level of education within the management team is *Master Craftsman*¹⁴ and for

¹²Presented figures are restricted to the first bank observation per firm in the sample. Differences to the figures presented in Table 2 are because cases rather than volume is considered. From comparison one can infer that private banks finance larger firms with higher credit volume.

¹³Ongena and Smith (2001) find that the number of relationships is 8 on average, while the median is 5. Also Elsas and Krahn (1998) report a median of 5 relations to banks.

¹⁴A master certificate represents a higher degree of business qualification awarded either

another 12 % is *Academic*. Early studies on firm survival (Audretsch and Mahmood, 1995; Mata et al., 1995; Honjo, 2000) used initial start-up size. In contrast Mata et al. (1995) and Esteve-Pérez and Manez-Castillejo (2008) argue that current size is a better failure predictor. Therefore, *Size* contains the log of the number of employees. Their polynomial control for non-linearity. Almost two third of the firms are younger than 13 years and less than 10 % are exists than 50 or more years.

Industry dummies capture differences in business structure and industry cycles.¹⁵ Almost a third of all financially distressed firms are located in East Germany.

3.3.3 Variables of Selection Equation

Selection equation consists of variables explaining the probability that financial distress is observed. *Branch Quality* captures differences in investigation quality. The variable is the common factor of the following indicator variables on the level of Creditreform branches per sample periode: First, the number of new firms observed related to the total number in stock. Second, time elapsed between firm foundation and first observation. Third, share of firms with unknown date of foundation. Fourth, share of firms obliged to register with unknown date of business registration. Fifth, share of firms with unknown number of employees and last, number of firms where the branch was asked information related to the total number of firms in stock. The first and latter have a positive effect on each branches' data quality while all others are negative. The constructed variable has an influence on the probability that financial distress is observed but it should not correlate with the error term of the main equation. For this reason *Branch Quality* is imposed as an exclusion restriction (Cameron and Trivedi, 2009). All other variables used in the selection equation are on the individual firm level and reflect whether sufficient firm related information should be available. These are defined in Table 5.

by the chamber of industry and commerce or the chamber of crafts.

¹⁵Firms allocation to industry dummies is based on German business classification code from 1993.

4 Empirical Analysis

4.1 Econometric Model

I now turn to the econometric model. In order to analyze how differences in market exit probabilities of financially distressed firms are related to the type of their bank, I estimate a probit model on firm survival. The model is closely related to that by Van de Ven and Van Praag (1981) which is slightly adjusted for my purpose. As noted in the previous Section, I can identify firms facing financial distress in the data. Unfortunately, I can not observe whether a bank applies audit to distinguish between viable and non-viable firms or if a renegotiation has taken place. However, I can distinguish between those firms that survive and those who have left the market. From this finding one can infer that surviving firms successfully renegotiate debt contracts. Everything else equal, the probability a distressed firm to survive should differ between financiers that adopt auditing and renegotiate debt if possible and those who have liquidated immediately or at least have applied stricter rules. The probability of market exit can be specified as:

$$M_i = \alpha'X_i + \epsilon_{1i} \quad (1)$$

where M is a dummy variable that equals 0 if the firm survives and 1 if it exits the market. The conditional probability for firm i , given X_i is observed is given by

$$P(M_i = 1|X_i) = P(\alpha'X_i + \epsilon_{1i} \geq 0|X_i) = H\left(\frac{\alpha'X_i}{\sigma_1}\right). \quad (2)$$

The conditional expected value of M_i , $E(M_i|X_i) = H(\alpha'X_i)$ falls within the $[0,1]$ interval and can be interpreted as the probability that a firm faces a situation of financial distress, given values of exogenous variables, exit the market. As already noticed in the previous chapter a situation of financial distress is potentially observed selectively. The data generating process may be analyzed by the means of probit analysis. The error terms in both probit estimations might contain some common omitted variables, i.e. $\rho(\epsilon_{1i}, \epsilon_{2i}) \neq 0$. In this case $\hat{\alpha}$ on the basis of only partly observed financial distress

yields inconsistent estimates. I correct for the potential bias as suggested by Heckman (1979) and applied for dichotomous variables by Van de Ven and Van Praag (1981). The regression function of the subsample of partly observed distressed firms can be written as:

$$E(M_i|X_i, D_i^* \geq 0) = \alpha'X_i + E(\varepsilon_{1i}|X_i, D_i^* \geq 0). \quad (3)$$

Under the assumption that ε_{1i} and ε_{2i} are bivariate standard normal distributed with correlation ρ it follows that

$$E(\varepsilon_{1i}|X_i, D_i^* \geq 0) = \rho\lambda_i \quad (4)$$

with

$$\lambda_i = \frac{h(A_i)}{H(-A_i)} \quad \text{and} \quad A_i = -[\beta X], \quad (5)$$

where h represents the pdf and H the cdf. The regression function can be rewritten as

$$M_i = \alpha'X_i + \rho\hat{\lambda}_i + \varepsilon_{1i}, \quad (6)$$

where M_i captures firm exit, and X_i consists of variables grouped as *Banking and Finance*, *Internal Factors*, and *External Factors*. The vector λ is not known but can be consistently estimated as $\hat{\lambda}$ based on the estimates of $\hat{\beta}$ of the probit *Selection Equation* explaining whether or not the observation belongs to the observed sub-sample.

4.2 Estimation Results and Discussion

Estimation Results In this section, I present the results of the cross-sectional regression of the market exit on the set of explanatory variables, as presented above. The model is estimated for the period of financial distress and up to 4 successive periods in order to take a delay in the borrowers' and lenders' decision making process, as well as a delay in observation of firm's market exit into account. Robust clustered standard errors are used due to firms with multiple episodes of financial distress during the sample period.

Table 7 reports the estimates of the bivariate selection equation. The

correlation coefficient $\hat{\rho}$ is found to be different from zero at a one per cent level of significance. Estimates obtained from a normal probit model are likely to be inefficient. *Branch Quality* is found to be positive, suggesting that branches with high investigation quality are more likely to observe firms in financial distress, as expected. Both variables, *Investigation* and *Debt Collection* are found to be positive, as expected, indicating that it is more likely to observe financial distress the faster detailed information is available. Dummy variables indicating missing information about age and industry are found to be negative significant. Surprisingly, *Business Register* is found to be negative. This result can be interpreted in the way that the effect that registered firms are less likely to run into difficulties outweighs the higher probability that this event is observed. Theory predicts that situations of financial distress occur more often to firms financed by savings or cooperative banks compared to private banks due to self selection according to individual risk. Corresponding coefficients are therefore expected to be positive. An explanation of the negative sign might be that it is more likely to observe financial distress during the market exit. If, as theory predicts firms financed by private banks leave the market more often the probability to observe those cases is higher and the sign for savings and cooperative banks turns negative.

I now turn to the firm survival equation. Table 1 provide marginal effects of selected variables. Table 8 shows the models coefficients and Table 9 the full list of marginal effects. Empirical findings support the hypotheses that lending strategies for financial distressed firms differ across bank types. More than a quarter of the difference in survival probability presented in Table 4 in the descriptive statistics can be assigned to the bank type. A firm's probability to survive the fourth period after financial distress is 1.3 percentage points higher if financed by *Public Banks* compared to the basis group of *Private Banks*.

Table 1: Marginal Effects

	(1)	(2)	(3)	(4)	(5)
VARIABLES	exit t	exit $t + 1$	exit $t + 2$	exit $t + 3$	exit $t + 4$
Banking and Finance					
Public Banks	-0.002	-0.004	-0.010*	-0.013**	-0.013**
	-0.005	(0.005)	(0.005)	(0.005)	(0.006)
Cooperative	-0.013**	-0.015***	-0.017***	-0.020***	-0.022***
Banks	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)
BMC	-0.011	-0.042	-0.068*	-0.054	-0.083**
	(0.037)	(0.039)	(0.040)	(0.042)	(0.042)
No. of bank	-0.008**	-0.008**	-0.007	-0.006	-0.006
relations	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Debt	-0.006	0.0002	0.002	0.007	0.010
Collection	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
History of	-0.014***	0.001	0.011***	0.018***	0.024***
distress	(0.004)	(0.004)	(0.003)	(0.004)	(0.004)
Real Estate	-0.047***	-0.046***	-0.042***	-0.039***	-0.042***
	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)
Internal and External Factors					
Business	0.316***	0.291***	0.268***	0.247***	0.225***
Register	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Management	-0.043***	-0.051***	-0.055***	-0.060***	-0.065***
Team	(0.008)	(0.008)	(0.008)	(0.009)	(0.009)
Master	-0.038***	-0.036***	-0.040***	-0.045***	-0.047***
Craftsman	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)
Academic	-0.027***	-0.026***	-0.030***	-0.034***	-0.039***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)
East	0.054***	0.057***	0.055**	0.052***	0.053***
Germany	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)
No. of Obs.	4,723,708	4,723,708	4,723,708	4,723,707	4,723,706

Selected Variables, Selection Equation included, robust clustered standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The effects are even stronger for cooperative banks than for public banks. This might be for two reasons. First, cooperative banks show the lowest risk portfolio. Since cooperative banks are traditionally involved in financing small firms they are well diversified. Unity of ownership (member of a cooperative society) and customer relation might be a further explanation of this effect. Although individual owner's influence is limited in cooperative banks due to "one head one voice" members that themselves might be entrepreneurs are seated in the banks committee deciding on investment guidelines.

However, it remains unclear whether this effect is due to a transaction based strategy of private banks and relationship lending by public and cooperative banks. If hypotheses stated by Matthey (2008) are valid and private banks adopt a hard-nosed lending strategy in order to attract low risk firms, public banks credit portfolio would need to show higher risk compared to private banks. In contrast to Paul et al. (2003), who estimated banks' portfolio risk based on self reported risk profiles by entrepreneurs, this can not supported by the data at hand. Private banks seem to finance more riskier firms. From Figure 1 one can infer that credit portfolio of public and cooperative banks is first and from Figure 2 that it is second order stochastic dominant compared to private banks' credit portfolio in terms of risk.¹⁶ If one assumes that private banks finance larger firms, the exposure at risk of private banks credit portfolio is even higher.

Banks active in concentrated markets are better able skimming future profits and offering relationship lending. As the number of banks active in a district decreases and concentration is therefore higher, firm's probability exiting the market decreases (See variable *BMC*). This finding is in line with hypotheses stated by Ongena and Smith (1998); Sharpe (1990); Rajan (1992). However, significance is weak and varies across periods, since there is low variation in concentration across districts. The measurement could also be improved by taking the bank's credit volume in corporate finance into account.

There are further interesting findings, concerning firm's financing behavior and internal factors influencing debt renegotiation as the underlying pro-

¹⁶Results of estimates of the cumulative distribution and kerneldensity using the overall rating are similar the same.

cess of firms exit probability. I find only low and mostly insignificant influence of the number of bank relations on firm survival. Firms or entrepreneurs that are able to offer *Real Estate* property for securitization show a lower probability exiting the market. The same is observed for firms that are managed by at least on person that hold a master certificate or university degree. Either educated managers have are better able to renegotiate debt or education signals better future prospects and therefore lower risk. A larger management team can better combine different abilities that are crucial for business. In addition, debt holders have a better position to execute their claims against a number of debtors in case of a market exit. Probability of market exit reduces as the number of managers increase.

There is a dynamic effect for firm's *History of Distress*. In the period of financial distress the effect is negative and significant, while the sign changes in period $t + 1$ and is significant from period $t + 3$ ongoing. Financiers know that the firm has managed several crises and are not willing to shut down immediately. Over time firms can present a concept how to deal with the crises. Financiers' on their part assess whether the firm is viable. Since it is likely that the firm is enfeebled after a series of financial distress this might not be the case and the firm might exit.

Further findings of internal and external factors of firm survival are in line with the literature, while two findings are worth to mention. First, age is found to have a non-linear negative effect on market exit. This finding is consistent with the literature on firm survival (Audretsch and Mahmood, 1995). With increasing firm age probability surviving financial crises increases substantially. The highest age class is an exception. Firms that age 50 years or older show a higher probability exiting the market compared to young firms. This might reflect difficulties in transferring business to another generation. Second, even ten to fifteen years after reunification firms located in Eastern Germany are more likely to exit the market. This reflects still existing regional differences in product and banking markets due to German reunification.

Robustness Checks, Discussion, and Limitations Data available, as well as, the corresponding empirical model have some limitations that need to

be considered for the interpretation of the results. Coefficients of *Business Register* are found to be positive and highly significant in all periods and marginal effects are considerably high. These findings are consistent with those presented by Harhoff et al. (1998) who argue that firms choose their legal form according to risk. More riskier firms tend to choose limited liability forms. However, as time after financial distress goes by the effect reduces indicating that it takes longer to observe voluntarily market exit of firms not publicly registered. Therefore, sample selection problems might still exist.

Market exits due to insolvencies might be over represented. Voluntary market exit is considered if related characteristics implemented by Creditreform can be observed only. A proper assumption would be that firms which were not investigated or information on which was not updated for a long time have closed. However, this would not solve the problem. Accordingly, observations of deteriorating mode of payment are rare for those firms.

In addition to firms exiting market after financial distress the panel also contains observations on firms that fail without deteriorating mode of payment. Three cases can be considered. First, the deteriorating state is simply not observed. Selection equation incorporated in the model should mitigate possible selection bias. Second, a firm's status already refers to the worst case. For this reason further deteriorating is not possible. An institutional problem is given by German bankruptcy legislation for indebted firms. Those need to file for bankruptcy, while bankruptcy is for balance sheet rather than solvency reasons. Logically, deteriorating status of mode of payment is not observed.

In addition, banks' lending strategy and firms' financial distress and exit might be endogenous. If the hypotheses of self selection of firms according their risk to a certain bank type stated by Matthey (2008) is valid, probability of distress is higher for firms financed by public and cooperative banks, respectively. The question arise whether bank dummies are endogenous. This should not be the case for the model presented here. The model is restricted to financial distressed firms only. In most cases the firm's choice of financing partner is made a long time ago. Further, the firms viability does not depend on that choice. For robustness check deteriorating state of firm's credit rating is used as dependent variable. Information concerning credit rating

is produced by Creditreform indicating the firms credit worthiness that is a part of the overall rating. Results remain stable and are provided by the author on request.

5 Conclusion

With this paper I have explored whether differences in banks' lending strategies exist. Firm's that build up a strong relationship to their main financing partner might find it easier to renegotiate debt if financial distressed. Public and cooperative banks have a mandate supporting regional economy and are traditionally involved in corporate finance. Those are said to act as relationship lenders. Theoretically, it might be rational for private banks to compete in debt repayment and act as a hard-nosed banker. In order to overcome the public banks' funding cost advantage private banks seek to attract low risk firms by threatening early liquidation of financially distressed. Private banks need to rule out renegotiation credibly. Otherwise high risk firms would free ride and private banks would no longer be able to compete profitably. Therefore, firms financed by public or cooperative banks should have a higher probability to survive financial distress.

For German firms in the period between 2000 and 2005, I find that the probability of exiting the market after financial distress is higher for firms financed by private banks compared to those financed by public banks. Effects are even larger for firms financed by cooperative banks. It remains unclear, whether this is because private banks act as hard-nosed bankers and are less likely to audit financial distressed firms or at least adopt stricter rules. Private banks may also take on riskier borrowers in the first place, indicated by a riskier credit portfolio. Firm's bank choice seems crucial for a better understanding of this effect and is left for further research.

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A Appendix

Table 2: Market Share of Banking Sectors in Germany, 2000-2005
Market Share in:

Market Share in:	Total Assets	Corporate Finance
Private Banks	39.8 %	44.0 %
thereunder:		
Real Estate Credit Institution	12.8 %	13.6 %
Commercial Banks	27.0 %	30.4
Public Banks	40.1 %	35.3 %
thereunder:		
Savings Banks	22.4 %	15.3 %
Landesbank	17.7 %	20.0 %
Cooperative Banks	12.4 %	12.1 %
Others	7.7 %	12.1 %

Source: Bundesverband deutscher Banken e.V. (2009)

Table 3: Description of Bank Types

No.	Bank or Bank Group	Description	Bank Type
1.	Deutsche Bundesbank	Central Bank.	excluded
2.	Real Estate and Commercial Banks	In general, legal form of limited liability; some are publicly listed companies; including branches of foreign banks.	Private Banks
3.	Landesbanken	Clearing houses for savings banks. Banks are jointly owned by savings banks and the Länder. ¹⁷	Public Banks
4.	Development Banks	Public development banks are governmentally owned and operate either on Länder or federal level. ¹⁸	excluded
5.	Commerzbank AG	Publicly listed company.	Private banks
6.	Savings Banks	Owned by area municipalities.	Public Banks
7.	Cooperative Banks	Owned by members of the cooperative society.	Cooperative Banks
8.	Deutsche Bank AG	Publicly listed company.	Private Banks

¹⁷Following institutions are classified as Landesbanken: HSH Nordbank (before 2003: Hamburgische Landebank, Landesbank Schleswig-Holstein), Norddeutsche Landesbank Girozentrale (NORD/LB), Bremer Landesbank, Landesbank Berlin (LBB), Westdeutsche Landesbank (WestLB), Landesbank Hessen-Thüringen Girozentrale (Helaba), Landeskreditkasse Kassel, Landesbank Sachsen (merged with LBBW in 2008), Landesbank Rheinland-Pfalz Girozentrale (LRP; merged with LBBW in 2008), Landesbank Saar (SaarLB; since 2002 mainly owned by BayernLB), Landesbank Baden-Württemberg/Baden Württembergische Bank (LBBW), Bayerische Landesbank (BayernLB), Deutsche Kreditbank, DekaBank, Deutsche WertpapierService Bank AG, NLB FinanzIT, LBS

¹⁸Following institutions are classified as Public Development Banks: Landestreuhandbank Rheinland-Pfalz, LfA Förderbank Bayern, L-Bank, Investitionsbank Berlin, Investitionsbank des Landes Brandenburg, Bremer Aufbau-Bank GmbH, Hamburgische Wohnungsbaukreditanstalt, LTH-Bank für Infrastruktur, Investitionsbank Hessen, Landesförderinstitut Mecklenburg-Vorpommern, N-Bank, Investitions- und Strukturbank Rheinland-Pfalz (ISB) GmbH, Sächsische Aufbaubank, Investitionsbank Sachsen-Anhalt, Investitionsbank Schleswig-Holstein, Thüringer Aufbaubank, Kreditanstalt für Wiederaufbau (KfW), Deutsche Ausgleichsbank (DtA, merged with KfW in 2003)

No.	Bank or Bank Group	Description	Bank Type
9.	Dresdner Bank AG	Publicly listed company. ¹⁹	Private Banks
10.	Central Bank for Cooperative Banks	Clearing houses for cooperative banks. Banks jointly owned by cooperative banks. ²⁰	Cooperative Banks

Table 4: Distress, market exit and type of main financing partner

Year	Private Banks			Savings Banks			Cooperative Banks			Total		
	Distress	Exit	%	Distress	Exit	%	Distress	Exit	%	Distress	Exit	%
2000	2,294	896	39.1	3,746	1,304	34.8	2,152	737	34.2	8,192	2,937	35.9
2001	2,510	1,076	42.9	4,263	1,498	35.1	2,305	828	35.9	9,078	3,402	37.5
2002	2,924	1,292	44.2	5,289	1,718	32.5	2,918	1,128	38.7	11,131	4,138	37.2
2003	3,029	1,319	43.5	5,789	2,307	39.9	3,248	1,238	38.1	12,066	4,864	40.3
2004	3,413	1,515	44.4	6,634	2,679	40.4	3,833	1,508	39.3	13,880	5,702	41.1
2005	2,999	1,295	43.2	6,271	2,594	41.4	3,431	1,350	39.3	12,701	5,239	41.2
Total	17,169	7,393	43.1	31,992	12,440	38.9	17,887	6,789	38.0	67,048	26,622	39.7

Note: Distress is defined as a deteriorating mode of payment status in the years 2000 to 2005. Market exit is considered until two years after distress.

Source: Author's own calculation based on the MUP (ZEW).

¹⁹Dresdner Bank AG merged with Commerzbank AG in 2008.

²⁰Following institutions are classified as central banks for cooperative banks: DZ Bank AG, WGZ Bank AG (Westdeutsche Genossenschaftliche Zentralbank), Deutsche Apotheke und Ärztebank eG

Table 5: Description of Variables

Variable	Description	Exp. Sign
Banking & Finance		
Private Banks	= 1 if a private bank is the main financing partner	+
Public Banks	= 1 if a public bank is the main financing partner	-
Cooperative Banks	= 1 if a cooperative bank is the main financing partner	-
Banking Market Concentration	= $\frac{1}{\text{no. of banks active in the district}}$?
No. of Bank relations	= number of bank relations	?
Debt Collection	= 1 if CREDITREFORM is commissioned to collect debt from the particular firm	+
Real Estate	= 1 if either residential, industrial or mixed property is owned	-
History of Distress	= \sum of situation of distress within the sample period	+
Internal Factors		
Business Register	=1 if companies need to be registered due to legal form	-
Size	= log of number of employees	Control
Size ²	= squared log of number of employees	Control
Size ³	= log of number of employees raised to the power of 3	Control
Age 1	= 1 if firm age is between 0 and 2	Control
Age 2	= 1 if firm age is between 3 and 6	Control
Age 3	= 1 if firm age is between 7 and 12	Control
Age 4	= 1 if firm age is between 13 and 19	Control
Age 5	= 1 if firm age is between 20 and 49	Control
Age 6	= 1 if firm age is 50 or older	Control
Age M	= 1 if firm age is missing	Control

Variable	Description	Exp. Sign
Management Team	= number of persons belonging to the management board	-
Management Team M	= number of persons belonging to the management board unknown	Control
Master Craftsman	= Entrepreneur with the highest education within the team holds a master certificate received from the chamber of industries and commerce or the chamber of crafts	-
Academic	Entrepreneur with the highest education within the team holds an university degree (either a German diploma, degree of doctor, or professorship)	-
External Factors		
Δ local Insolven- cies	= the insolvency in a particular district compared to previous year	+
East Germany	= 1 if firm is located in East Germany	+
Industry 1	= 1 Cutting Edge Technology	Control
Industry 2	= 1 if High Technology	Control
Industry 3	= 1 if Manufacturing	Control
Industry 4	= 1 if Technology-intensive Services	Control
Industry 5	= 1 if Consultancy	Control
Industry 6	= 1 if Industry-related Services	Control
Industry 7	= 1 if Consumer Services	Control
Industry 8	= 1 if Energy and Mining	Control
Industry 9	= 1 if Construction	Control
Industry 10	= 1 if Retail and Wholesale	Control
Industry 11	= 1 if Transportation	Control
Industry 12	= 1 if Postal and IT Services	Control
Industry M	= 1 if Industry code is unknown	Control
Year	= 1 if year is respective year	Control
Selection Equation		
Branch Quality	= Research Quality of Creditreform branches per period	

Variable	Description	Exp. Sign
Investigation	= 1 if Creditreform investigated the firm within that period	
Business Register	=1 if companies need to be registered due to legal form	
Debt Collection	= 1 if Creditreform is commissioned to collect debt from the particular firm	
Industry M	= 1 if Industry code is unknown	
Age M	= 1 if date of foundation is unknown	
Employee M	= 1 if Number of employees is unknown	
Public Banks	= 1 if a public bank is the main financing partner	
Cooperative Banks	= 1 if a cooperative bank is the main financing partner	
Bank M	= 1 if information on banking partner is missing	

Table 6: Descriptive Statistics

Variable	Obs.	Mean	SD	Min	Max
Selection Equation					
Branch Quality	4,723,716	-0.004	1.095	-9.405	1.741
Investigation	4,723,716	0.119	0.324	0	1
Business Register	4,723,716	0.236	0.425	0	1
Debt Collection	4,723,716	0.022	0.145	0	1
Industry M	4,723,716	0.156	0.363	0	1
Age M	4,723,716	0.136	0.343	0	1
Main Equation					
Banking & Finance					
Public Banks	67,048	0.477	0.410	0	1
Cooperative Banks	67,048	0.267	0.442	0	1
BMC	67,048	0.080	0.055	0.006	1
No. of bank relations	67,048	1.281	0.594	1	6
Debt Collection	67,048	0.113	0.317	0	1
History of distress	67,048	1.295	0.596	1	6

Variable	Obs.	Mean	SD	Min	Max
Real Estate	67,048	0.248	0.432	0	1
Internal Factors					
Business Register	67,048	0.270	0.444	0	1
Size	67,048	8.389	92.446	1	15,241
Age 2	67,048	0.263	0.440	0	1
Age 3	67,048	0.293	0.455	0	1
Age 4	67,048	0.163	0.369	0	1
Age 5	67,048	0.126	0.332	0	1
Age 6	67,048	0.092	0.289	0	1
Management Team	59,436	1.064	0.286	1	9
Management Team M	67,048	0.114	0.317	0	1
Master Craftsman	67,048	0.120	0.325	0	1
Academic	67,048	0.115	0.320	0	1
External Factors					
Industry 1	67,048	0.004	0.063	0	1
Industry 2	67,048	0.008	0.091	0	1
Industry 3	67,048	0.078	0.268	0	1
Industry 4	67,048	0.041	0.198	0	1
Industry 5	67,048	0.035	0.185	0	1
Industry 6	67,048	0.041	0.197	0	1
Industry 7	67,048	0.192	0.395	0	1
Industry 9	67,048	0.191	0.393	0	1
Industry 11	67,048	0.062	0.240	0	1
Industry 12	67,048	0.004	0.060	0	1
Industry M	67,048	0.054	0.225	0	1
East Germany	67,048	0.301	0.459	0	1
Δ local Insolvencies	67,048	9.205	27.816	-85.7143	360
Year 2000	67,048	0.122	0.328	0	1
Year 2001	67,048	0.135	0.342	0	1
Year 2003	67,048	0.180	0.384	0	1
Year 2004	67,048	0.207	0.405	0	1
Year 2005	67,048	0.189	0.392	0	1

Table 7: Model Results - Part 1 Selection Equation

Selection Equation	(1)	(2)	(3)	(4)	(5)
VARIABLES	MoP	MoP	MoP	MoP	MoP
Branch Quality	-0.036*** (0.001)	-0.036*** (0.001)	-0.036*** (0.001)	-0.036*** (0.0014)	-0.036*** (0.001)
Investigation	0.455*** (0.004)	0.457*** (0.004)	0.459*** (0.004)	0.460*** (0.0040)	0.461*** (0.004)
Business Register	-0.048*** (0.004)	-0.048*** (0.004)	-0.048*** (0.004)	-0.048*** (0.004)	-0.048*** (0.004)
Debt Collection	0.741*** (0.006)	0.741*** (0.0063)	0.741*** (0.006)	0.741*** (0.006)	0.741*** (0.006)
Industry M	-0.321*** (0.007)	-0.321*** (0.007)	-0.322*** (0.007)	-0.322*** (0.007)	-0.322*** (0.007)
Age M	-0.348*** (0.008)	-0.341*** (0.0083)	-0.336*** (0.008)	-0.333*** (0.008)	-0.329*** (0.008)
Constant	-2.243*** (0.003)	-2.244*** (0.003)	-2.244*** (0.003)	-2.245*** (0.003)	-2.245*** (0.003)
$\hat{\rho}$	0.740*** (0.035)	0.635*** (0.032)	0.562*** (0.031)	0.525*** (0.030)	0.472*** (0.030)

Robust clustered (firm) standard errors in parentheses; *** $p < 0.01$,

** $p < 0.05$, * $p < 0.1$

Table 8: Model Results - Part 2 Main Equation

Main Equation	(1)	(2)	(3)	(4)	(5)
VARIABLES	exit t	exit $t + 1$	exit $t + 2$	exit $t + 3$	exit $t + 4$
Banking & Finance					
Public	-0.005	-0.009	-0.023*	-0.031**	-0.032**
Banks	(0.011)	(0.012)	(0.013)	(0.013)	(0.013)
Cooperative	-0.030**	-0.036***	-0.041***	-0.046***	-0.053***
Banks	(0.013)	(0.014)	(0.014)	(0.015)	(0.015)
BMC	-0.025	-0.099	-0.159*	-0.124	-0.196**
	(0.086)	(0.093)	(0.095)	(0.098)	(0.100)
No. of bank	-0.019**	-0.0198**	-0.0155	-0.0132	-0.0142
relations	(0.009)	(0.010)	(0.0100)	(0.010)	(0.010)
Debt Collection	0.391***	0.364***	0.337***	0.330***	0.311***
	(0.020)	(0.020)	(0.021)	(0.021)	(0.021)
History of	-0.033***	0.004	0.026***	0.042***	0.056***
distress	(0.009)	(0.009)	(0.009)	(0.009)	(0.010)
Real Estate	-0.112***	-0.112***	-0.103***	-0.093***	-0.101***
	(0.012)	(0.013)	(0.013)	(0.014)	(0.014)
Internal Factors					
Business	0.661***	0.633***	0.594***	0.549***	0.507***
Register	(0.016)	(0.016)	(0.016)	(0.015)	(0.015)
Size	-0.009	0.0247	0.053**	0.076***	0.104***
	(0.019)	(0.021)	(0.021)	(0.021)	(0.022)
Size ²	0.058***	0.049***	0.041***	0.030**	0.015
	(0.012)	(0.013)	(0.013)	(0.013)	(0.013)
Size ³	-0.011***	-0.011***	-0.011***	-0.010***	-0.007***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Age 2	-0.045**	-0.101***	-0.123***	-0.131***	-0.138***
	(0.019)	(0.020)	(0.021)	(0.021)	(0.021)
Age 3	-0.148***	-0.239***	-0.287***	-0.315***	-0.337***
	(0.019)	(0.021)	(0.022)	(0.022)	(0.022)
Age 4	-0.207***	-0.299***	-0.350***	-0.382***	-0.407***
	(0.021)	(0.023)	(0.024)	(0.024)	(0.024)

Main Equation	(1)	(2)	(3)	(4)	(5)
VARIABLES	exit t	exit t+1	exit t+2	exit t+3	exit t+4
Age 5	-0.188*** (0.023)	-0.298*** (0.024)	-0.356*** (0.025)	-0.391*** (0.026)	-0.416*** (0.026)
Age 6	0.483*** (0.029)	0.378*** (0.029)	0.313*** (0.029)	0.266*** (0.029)	0.234*** (0.029)
Management Team	-0.100*** (0.0181)	-0.121*** (0.019)	-0.132*** (0.020)	-0.142*** (0.020)	-0.153*** (0.021)
Management Team M	-0.224*** (0.026)	-0.245*** (0.028)	-0.257*** (0.029)	-0.275*** (0.029)	-0.282*** (0.030)
Master Craftsman	-0.090*** (0.016)	-0.089*** (0.017)	-0.097*** (0.018)	-0.109*** (0.018)	-0.115*** (0.019)
Academic	-0.065*** (0.016)	-0.062*** (0.017)	-0.074*** (0.018)	-0.083*** (0.018)	-0.095*** (0.019)
External Factors					
Industry	Yes***	Yes***	Yes***	Yes***	Yes***
East	0.124*** (0.011)	0.134*** (0.012)	0.129*** (0.013)	0.123*** (0.013)	0.127*** (0.013)
Germany	0.0006*** (0.0002)	0.0008*** (0.0002)	0.0006*** (0.0002)	0.0005*** (0.0002)	0.0005*** (0.0002)
Δ local	0.0006*** (0.0002)	0.0008*** (0.0002)	0.0006*** (0.0002)	0.0005*** (0.0002)	0.0005*** (0.0002)
Insolvencies	Yes***	Yes***	Yes***	Yes***	Yes***
Year	Yes***	Yes***	Yes***	Yes***	Yes***
Constant	-2.078*** (0.055)	-1.776*** (0.061)	-1.542*** (0.065)	-1.365*** (0.066)	-1.166*** (0.069)
No. of Obs.	4,723,716	4,723,704	4,723,687	4,723,677	4,723,662

Robust clustered (firm) standard errors in parentheses; *** $p < 0.01$,

** $p < 0.05$, * $p < 0.1$

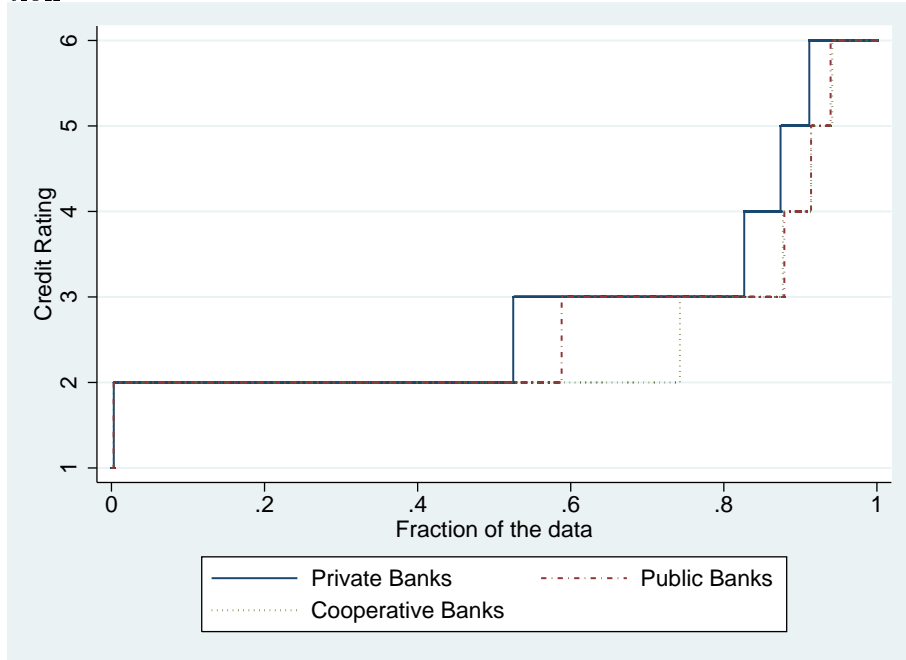
Table 9: Marginal Effects

	(1)	(2)	(3)	(4)	(5)
VARIABLES	exit t	exit $t + 1$	exit $t + 2$	exit $t + 3$	exit $t + 4$
Banking & Finance					
Public Banks	-0.002 (0.005)	-0.004 (0.005)	-0.010* (0.005)	-0.013** (0.005)	-0.013** (0.006)
Cooperative Banks	-0.013** (0.005)	-0.015*** (0.006)	-0.017*** (0.006)	-0.020*** (0.006)	-0.022*** (0.006)
BMC	-0.011 (0.037)	-0.042 (0.039)	-0.068* (0.040)	-0.054 (0.042)	-0.083** (0.042)
No. of bank relations	-0.008** (0.004)	-0.008** (0.004)	-0.007 (0.004)	-0.006 (0.004)	-0.006 (0.004)
Debt Collection	-0.006 (0.006)	0.0002 (0.006)	0.002 (0.006)	0.007 (0.006)	0.010 (0.006)
History of distress	-0.014*** (0.004)	0.001 (0.004)	0.011*** (0.003)	0.018*** (0.004)	0.024*** (0.004)
Real Estate	-0.047*** (0.005)	-0.046*** (0.005)	-0.042*** (0.005)	-0.039*** (0.006)	-0.042*** (0.006)
Internal Factors					
Business Register	0.316*** (0.006)	0.291*** (0.006)	0.268*** (0.006)	0.247*** (0.006)	0.225*** (0.006)
Size	-0.004 (0.008)	0.010 (0.009)	0.022** (0.009)	0.032*** (0.009)	0.043*** (0.009)
Size ²	0.025*** (0.005)	0.021*** (0.005)	0.017*** (0.005)	0.013** (0.005)	0.007 (0.005)
Size ³	-0.005*** (0.0008)	-0.005*** (0.0008)	-0.004*** (0.0008)	-0.004*** (0.0008)	-0.003*** (0.0008)
Age 2	-0.019** (0.008)	-0.042*** (0.008)	-0.051*** (0.008)	-0.055*** (0.009)	-0.057*** (0.009)
Age 3	-0.061** (0.008)	-0.096*** (0.008)	-0.115*** (0.008)	-0.128*** (0.008)	-0.137*** (0.008)
Age 4	-0.084*** (0.008)	-0.116*** (0.008)	-0.136*** (0.008)	-0.150*** (0.008)	-0.160*** (0.009)

	(1)	(2)	(3)	(4)	(5)
VARIABLES	exit t	exit t+1	exit t+2	exit t+3	exit t+4
Age 5	-0.076*** (0.009)	-0.116*** (0.009)	-0.138*** (0.009)	-0.154*** (0.009)	-0.164*** (0.009)
Age 6	0.219*** (0.012)	0.164*** (0.012)	0.134*** (0.012)	0.114*** (0.012)	0.099*** (0.012)
Management Team	-0.043*** (0.008)	-0.051*** (0.008)	-0.055*** (0.008)	-0.060*** (0.009)	-0.065*** (0.009)
Management Team M	-0.092*** (0.010)	-0.099*** (0.010)	-0.104*** (0.011)	-0.112*** (0.011)	-0.115*** (0.012)
Master Craftsman	-0.038*** (0.007)	-0.036*** (0.007)	-0.040*** (0.007)	-0.045*** (0.007)	-0.047*** (0.008)
Academic	-0.027*** (0.007)	-0.026*** (0.007)	-0.030*** (0.007)	-0.034*** (0.007)	-0.039*** (0.008)
External Factors					
Industry	Yes***	Yes***	Yes***	Yes***	Yes***
East	0.054*** (0.005)	0.057*** (0.005)	0.055** (0.005)	0.052*** (0.005)	0.053*** (0.006)
Germany	0.0003***	0.0003***	0.0002***	0.0002***	0.0002***
Δ local	(7.3e-5)	(7.5e-5)	(7.4e-5)	(7.4e-5)	(7.5e-5)
Insolvencies	Yes***	Yes***	Yes***	Yes***	Yes***
Year	Yes***	Yes***	Yes***	Yes***	Yes***
No. of Obs.	4,723,708	4,723,708	4,723,708	4,723,707	4,723,706

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

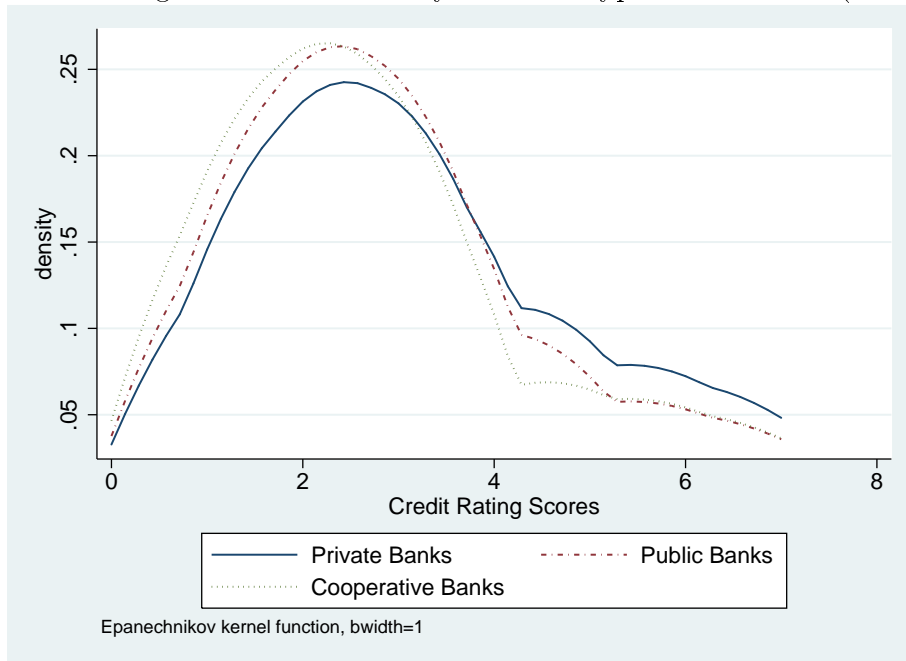
Figure 1: Risk Portfolio related to Bank Type (2005) - Cumulative Distribution



Note: Credit Rating Score 1 indicate low risk and 6 high risk. Calculation is based on the number of firms financed by each bank type where a credit risk score was assigned by Creditreform in August 2005.

Source: Author's own calculation based on the MUP (ZEW)

Figure 2: Kerneldensity of Bank Types Credit Risk (2005)



Note: Credit Rating Score 1 indicate low risk and 6 high risk. Calculation is based on the number of firms financed by each bank type where a credit risk score was assigned by Creditreform in August 2005.

Source: Author's own calculation based on the MUP (ZEW)