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From soft and hard-nosed bankers: bank lending strategies and the survival of financially distressed firms

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

Daniel Höwer

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Executive Summary

Public banks face a public contract to provide credit access to firms and households within their business district. Closely related to that, cooperative banks aim to support their members. Both are asked to finance projects as long as economically sustainable. Bank owners grand additional payment that reduce refinancing costs. It is argued, that private banks are disadvantaged due to these refinancing cost differentials and competition is distorted. While the strategy set of public and cooperative banks is fixed, private banks are free to choose which strategy they want to apply.

In this paper I analyze, whether private banks adopt a different lending strategy. If private banks act as "hard-nosed" bankers as firms become financially distressed, the probability of market exit should be higher compared to firms financed by public or cooperative banks. In order to test this empirically probit models are employed estimating the probability of market exit for firms that became financially distressed in the years between 2000 and 2005. A Heckman variation of the probit model controls for potential selection bias due to the data generating process. Information on firm's financing behavior, entrepreneurial education, as well as internal and external factors influencing a firm's market exit are used as covariates. Results show that firms with a savings or a cooperative bank as their main bank present a lower probability of exiting the market than those with private banks.

The reasons for different lending strategies remain unclear. A possible explanation would be that private banks adopt stricter rules when firms become financial distressed. Private banks could ask for additional control rights or rule out renegotiation in general. Private banks credit portfolio risk reduces indirectly if high-risk firms anticipated the behavior of the private banks and self select to public or cooperative banks. But the approximated credit portfolio risk by bank types, based on firms credit rating scores, indicate that private banks bear higher risk compared to public or cooperative banks.

Nicht-technische Zusammenfassung

Sparkassen und andere öffentliche Banken verfolgen neben ihren wirtschaftlichen Zielen den öffentlichen Auftrag, für die Kreditversorgung in ihrem Geschäftsgebiet Sorge zu tragen. Kreditgenossenschaften haben das Ziel, ihre Mitglieder zu fördern. Die Strategie in der Kreditvergabe ist insofern eingeschränkt, dass beide Banktypen die Finanzierung von Unternehmen in finanziellen Schwierigkeiten aufrechterhalten, soweit dies als ökonomisch tragfähig erscheint. Private Banken sind in ihrer Strategienwahl nicht eingeschränkt.

In diesem Papier wird untersucht, ob sich die Ausfallwahrscheinlichkeit von Unternehmen in finanziellen Schwierigkeiten nach dem Banktyp unterscheidet. Sollten Privatbanken als Banker mit einer "kalten Schnauze" auftreten, dann müssten von diesen Banken finanzierte Unternehmen in finanziellen Krisen eine höhere Marktaustrittswahrscheinlichkeit aufzeigen. Mit Hilfe von Probit Modellen wird die Marktaustrittswahrscheinlichkeit von Unternehmen geschätzt, die zwischen den Jahren 2000 und 2005 in finanzielle Schwierigkeiten geraten sind. Eine Heckman-Variante kontrolliert für eine Selektion des datengenerierenden Prozesses. Als Kovariate fliessen Informationen zum Finanzierungsverhalten, Bildungsgrad des Unternehmers, unternehmensinterne sowie externe Faktoren des Marktaustritts in die Schätzungen ein. Die Ergebnisse zeigen, dass Unternehmen mit einer Sparkasse als Hausbank eine geringere Marktaustrittswahrscheinlichkeit aufweisen. Der Effekt ist für Genossenschaftsbanken noch ausgeprägter.

Die Gründe für den Zusammenhang zwischen Banktyp und Wahrscheinlichkeit des Marktaustritts eines Unternehmens sind allerdings weniger eindeutig. Eine Erklärung könnte sein, dass Privatbanken Nachverhandlungen von Krediten anders handhaben und stärkere Kontrollrechte fordern oder Nachverhandlungen ausschließen. Dies würde indirekt zu einer Risikoreduzierung im Kreditportfolio von Privatbanken führen, sollten "risikoreiche" Unternehmen dieses Verhalten antizipieren und vorrangig Partnerschaften mit Sparkassen oder Genossenschaftsbanken eingehen. Auf der Basis von unternehmensbezogenen Kreditscores wurde die Risikostruktur der Bankengruppen approximiert. Die Ergebnisse deuten allerdings auf ein höheres Risiko bei Privatbanken hin.

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

Daniel Höwer *

October 2009

Abstract

Do private banks act as hard-nosed bankers when firms get financially distressed compared to public banks that have the mandate to support regional economy?

For German firms in the period 2000-2005, I find that the probability of leaving the market after financial distress is higher for firms financed by private banks. The effects of different lending strategies are even larger for cooperative banks than for public banks.

Keywords: financially distressed firms, bank lending, public banks, cooperative banks

JEL Classification: G21, G33, L14

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1 Introduction

Financial intermediaries screen projects and allocate funds in profitable investments. As complete contracts are not feasible there may be a need to renegotiate financial contracts. This is especially true for firms becoming financially distressed. Banks can audit the firm again and decide whether to keep financing or to liquidate it. Banks can "*lean against the wind*" and keep with their customers when they are most in need (Petersen and Rajan, 1995). They do so, if expected, discounted future payments are higher than liquidation value of the firm's assets. During renegotiation banks will ask for further control rights over firms assets (Ongena and Smith, 1998). Debt becomes equity-like as the relationship between the bank and their customer gets closer and the bank is able to obtain inside information. This puts banks in a better position to extract future surplus from profitable projects.

Lending strategies might differ between banks. Bank's possibility to extract future surpluses depends on their investment in sector specification and the concentration in the local banking market (Boot and Thakor, 2000). In addition, lending behavior might differ among bank types. In Germany, private banks compete in a market with public and cooperative banks. Public and cooperative banks have a mandate or aim supporting regional economic development (Baas and Schrooten, 2005; Hakenes and Schnabel, 2006; Engerer, 2006) and keep financing financially distressed but viable firms (Matthey, 2008). Traditionally, public and cooperative banks build up close relationships to their customers and adopt different lending strategies compared to private banks (Engerer and Schrooten, 2004). There is anecdotic evidence that private banks act as hard-nosed bankers and are not that interested in relationships especially with small and medium sized firms. Hilmar Kopper[1] 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]

[1] Hilmar Kopper, the chairman of the Detusche Bank from 1989-1997 made the statement during press a conference on April 24th, 1994 (Frankfurter Allgemeine Zeitung, 1994).

[2] The Deutsche Bank was heavily involved in financing a construction company owned by Jürgen Schneider. The company modernized historical buildings, in particular. In order

Although close bank relations can be beneficial for firms, especially in an episode of financial distress, they come at a cost. Firms are informational locked in and can not easily switch to other financing partners (Boot and Thakor, 2000). In addition to bank's lending strategy and firm's financing behavior, firm's probability of market exit depends on internal and external factors, such as firm age, industry or the entrepreneurs educational background.

In this article I explore whether the probability of market exit of financially distressed firms depends on the bank type of their housebank. I use further variables in order to control for firm's financing behavior, as well as internal and external factors. The sample is restricted to the 2000 - 2005 period. The model controls for serious selection bias concerning unobserved distress situations of firms survived. I will show that the 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 lending and firm survival. Section 3 describes data sources and variables. Since the German "three pillar banking system" is special, a brief description of the main differences is provided.[3] In section 4 the empirical model and results are presented and discussed. Section 5 summarizes the findings and concludes the paper.

2 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 they reduce costly information asymmetries. Therefore, financial intermediaries allocate capital to profitable investment projects and decide on their liquidation if unprofitable. As the share of funds provided is suffi-

to receive finance, documents and books were manipulated. Information became public and the firm failed in 1994. The total bank debt accumulated to 5.4 bn DEM, around 2 bn DEM financed by the Deutsche Bank.

[3] A more detailed analysis of the German financial system and the link to corporate finance is provided in Krahnen and Schmidt (2004).

ciently large, there is a direct link between bank lending and the survival of financially distressed firms. 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).

Bank's Lending Strategy Banks benefit from a long-term relationship strategy as intertemporal transfers in loan pricing are 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 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 can exert control over the firms' asset management (Ongena and Smith, 1998). Inside information also increases liquidation value of provided securities (Diamond and Rajan, 2001*a*,*b*) and put lenders in a better position when it comes to renegotiation of debt contracts (Boot and Thakor, 2000).

Banks need to invest in sector specification in order to generate expertise and to add value. Since banks' specification cost is independent of borrowers' quality, but rent is a decreasing function of borrowers' quality, costs exceed the marginal benefit at a sufficiently high quality level (Boot and Thakor, 2000). Bank's investment in sector specification, and therefore it's lending strategy, critically depends on the competition within the banking market and from the capital market (Ongena and Smith, 1998; Sharpe, 1990; Rajan, 1992; Boot and Thakor, 2000). A monopolistic bank can charge low payments during the period of financial distress and extract future surpluses. In a competitive banking environment banks should be less likely to keep financing financially distressed firms, since those with improved quality seek finance from competitors and switch the bank (Petersen and Rajan, 1995).

Strategies financing financially distressed firms might be different among bank types. Public banks and cooperative banks build up close relationships to their local customers. They are especially involved in small and medium entrepreneurial finance and invest in specification of sectors that are related

to their business operating area (Engerer and Schrooten, 2004). These banks have a mandate or aim supporting regional economic development (Baas and Schrooten, 2005; Hakenes and Schnabel, 2006). Related to corporate finance this can be interpreted in a way that public banks keep financing financial distressed firms that are still viable (Matthey, 2008).

Firms financing behavior Firm's survival probability after financial distress is also influenced by its financing behavior. Relationship building in lending adds value to borrowers in several dimensions. Firms have an easier access to finance and reduced collateral requirements (Petersen and Rajan, 1995), the "'two-audience" signaling problems is reduced (Boot, 2000), and an insurance in case of sudden and temporary difficulties is provided (Elsas and Krahnen, 1998). The costs are an information monopoly of the main lender that possesses a potential risk on borrowers due to ex post bargaining power (Elsas and Krahnen, 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. But 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).

Further determinants of firms exit Literature on firm survival identifies several internal (firm-specific) and external factors related to the firm's business environment (Manjón-Antolín and Arauzzo-Carod, 2008) influencing a firm's probability of exit. These factors also need to be considered in order to explore the bank types influence of market exit of financially distressed firms.

Geroski (1995) suggests that firm 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 abilities, 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. They may also be in a better 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, the firm's probability of survival is influenced not only by the main bank's type but also by the firm's 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 gener-

ating process are described, followed by definitions and descriptive statistics of variables at hand.

3.1 German Banking System

The structure of the German banking system is often described as the "Three Pillar System" (Krahnen and Schmidt, 2004; Engerer and Schrooten, 2004) and consists of public, cooperative and private banks. Table 3 provides a list of banks assigned to the above mentioned bank types.

There are four types of public banks active in Germany. The Deutsche Bundesbank (no. 1, Table 3) and public development banks (no. 4, Table 3, either on the state or federal level) have special purposes. Since these banks do not act as ordinary lenders within the German banking system, they are excluded from the analysis. Savings banks are owned by the district or municipality and are therefore organized in a decentralized manner. Governments need to credibly promise bail-out of state-owned banks in order to avoid bank runs. Owners' liability for additional payments used to be an important characteristic of state-owned banks.[4] The savings banks act restricts the operating area of savings banks to the area of the district or municipality by whom they are owned[5] and defines 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)), as well as banking group specific regulation in addition to overall banking regulation. Savings banks act as ordinary lenders with a market share of 15% in corporate finance (see Table 2).

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

[4] Gewährträgerhaftung and Anstaltslast describe an unlimited cover by the banks owners in case of distress. Within the transition period from 19.07.2001 to 18.07.2005 Anstaltslast and Gewährträgerhaftung for savings banks were abolished. Because of grandfathering major change came into place in 2005.

[5] Local or regional restriction of the bank's operating area is also known as the "Regional Principle".

financing cases.

Landesbanks 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. These banks are involved in local public business development programs but also participate in corporate finance directly (with a market share of 20%).[6]

Cooperative banks are owned by individuals that hold cooperative shares. The purpose of cooperative banks is "*to promote the acquisition and the business of members*" (Engerer, 2006, p. 15). 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). The supervisory board is elected by the cooperative members while 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 additional but restricted payment.

Private banks are either commercial banks or real-estate credit institutions. Mostly, these banks operate in a legal form of a public listed stock or a limited liability company. Therefore, owners' liability is limited by their capital contribution. Private banks take a decision on the 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 a full back up of Creditreform's data warehouse of firm-level data and constructs the panel. The database has a nearly 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 every 9 months. Firm information is collected

[6] See 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.

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.

The MUP contains information concerning firm's bank relations. A bank panel containing information on the number of branches, bank type, the bank's business district, and the number of competitors in local banking markets[7] is matched with respective bank relations. Due to consolidation in German banking market, the number of banks reduced considerably during the sample period. The bank panel reflects bank mergers between 2000 and 2005.[8]

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 in the next $t + n$ periods, where n equals a 6 months period. For data processing reasons the sample is a randomized 10% sub-sample of the total population of economically active, non-financial firms that have become financially distressed. In 2005 unlimited state guarantees for public banks were abolished and important legislative changes came in

[7] Local 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.

[8] Information 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.

power concerning standards of banks' decision making process in lending.[9] These regulatory changes might have influenced banks' lending strategy, especially the way of dealing with financially distressed firms. Therefore, the sample is restricted to the period between 2000 and 2005. The years 2006 and 2007 are left for the identification of market exit in successive sample periods.

Identification of financially distressed firms Identification of financial distress is crucial for the sample selection. It is identified if the firm's mode of payment status deteriorates, based on information provided in the MUP. Similar to Kaiser (2001), the characteristics of firms' mode of payment are categorized in four groups. First, mode of payment is without any complaints or mode of payment is sound but occasional payments have been made after term of payment expired. Second, payments have been made later than 30 days after the agreed term of payment or the firm has been reminded several times. Third, payments has been delayed seriously, e.g. payments have not been made within three month, and fourth, no payments have been made due to insolvency. An episode of financial distress is defined as an increase in the firms' mode of payment status. The fourth category does not directly determine market exit. Moreover, there is a sufficiently large number of firms which mode of payment status recovered.

Firms are selected according to this restriction variable. The overall sample consists of 556,595 firms of which 67,550 firms have become financial distressed. Because firms can face several episodes of financially distress within the sample period a total of 86,564 cases are observed. Due to data limitation for certain variables 67,102 cases are used for the empirical analysis. For robustness checks a change in the firm's credit worthiness, assessed by Creditreform, is used as an indicator of financial distress.

Identification of firm's market exit Firm's exit serve as the dependent variable. Insolvencies are known since any insolvency proceeding is to be

[9] Next to abolished state guarantees for public banks the Basle II accord came into power at the end of that period via the Bundesamt für Finanzaufsicht letters 34/2002 (minimum standards for business credit), 18/2005 (minimum standards for risk management), and European Union guidelines 2006/48 and 2006/49.

made public. Voluntary exit is considered if recognized by Creditreform. In some cases I observed a deterioration of the mode of payment status later than the date of market exit. In these cases I set the date of market exit equal to the last change in mode of payment observed in the panel.[10] Table 4 presents the number of financially 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. A comparison of columns 4, 7, and 10 shows that firms financed by private banks exit the market more often after financial distress. On average, financial distress is found for 1.89% of observations per sample period. In 39.3% of these cases, firms exit the market within four successive sample periods.

3.3.2 Independent Variables

Following with the discussion Section 2, I assume that exit of distressed firms depends on the firm's banking and finance behavior as well as on internal and external factors. Table 5 defines variables and presents descriptive statistics of independent variables for financially distressed firms.

In the overall panel, 23.8% of the firms use a private bank as the main bank, 48.5% of the firms use public banks and 27.7% use cooperative banks.[11] Regional banking market concentration is considerably high, given 12 banks active per district on average.

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 and counts the number of bank branch relations. Different branches belonging to the same bank holding count as one. The median number of bank relationships is one while the mean is 1.28. These findings are considerably lower compared to other studies concerning Germany. Elsas and Krahnen (1998) report a median of 5

[10] This is the case for 2.469 episodes of financial distress, while 2,270 firms are affected.

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

relations to banks and Ongena and Smith (2001) find that the number of relationships is 8 on average, while the median is 5. Unfortunately, the share of finance according to the banks is not observed. 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*. I assume that banks collateralize any residential, commercial, or mixed property owned by the firm. A quarter of all firms can use *Real Estate* property as collateral for bank loans. 18% of the financially distressed firms of the sample face two or more episodes of financial distress covered by the variable *History of Distress*. The mean is 1.295 while only four firms have a maximum of 6 episodes 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 managed by a single entrepreneur rather than a *Management Team*. Successful negotiation with claim holders might also be influenced by personal ability that is captured by entrepreneurs' educational background. For 12% of all firms in the sample the highest level of education within the management team is *Master Craftsman*[12] and for another 12% *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 in the respective period. Second and third polynomial of size controls for non-linearity. Almost two third of the financially distressed firms are less than 13 years old and 10% age 50 years or older.

Industry dummies capture differences in business structure and industry cycles.[13] Almost a thirds of all financially distressed firms are located in East

[12] A master certificate represents a higher degree of business qualification awarded either by the chamber of industry and commerce or the chamber of crafts.

[13] Firms allocation to industry dummies is based on German business classification code from 1993.

Germany.

3.3.3 Variables of Selection Equation

The selection equation consists of variables explaining the probability of observing financial distress. Quality of investigation differs among Creditreform branches. I analyze the following information in order to asses quality per branch and period: First, the time elapsed between firm foundation and the first observation. Second, the share of firms with unknown date of foundation. Third, the share of firms obliged to register with unknown date of business registration. Fourth, the share of firms for which the number of employees is unknown. Fifth, the number of new firms observed related to the total number in stock and last, the number of firms where the branch was asked for information related to the total number of firms in stock. The last two have a positive effect on the investigation quality of each branch while all others are negative. High correlation between these variables would lead to serious multicollinearity problems while the underlying factor remained as "quality" is of interest. For this reason *Branch Quality* expresses the common factor of these variables.

The constructed variable should have an influence on the probability that financial distress is observed but it should not be correlated 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. They are defined in Table 5.

4 Empirical Analysis

4.1 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 Van de Ven and Van Praag (1981). 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 firms that survive and those that exit the market. From this finding, I can infer that surviving firms successfully renegotiate debt contracts. All else equal, the probability that a distressed firm will survive should differ across different banks types. The probability of market exit can be specified as:

$$M_i = \alpha' X_i + \epsilon_{1i} \tag{1}$$

where M_i is a dummy variable that equals 0 if firm i survives and 1 if it exits. X_i is a vector of independent variables of firm i. The probability for firm i, conditional on X_i, is given by

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

The conditional expected value of M_i, $E(M_i|X_i) = H(\alpha' X_i)$ can be interpreted as the probability that a firm in financial distress exit the market. As already noticed in the previous section, 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. $\rho(\varepsilon_{1i}, \varepsilon_{2i}) \neq 0$. In this case, $\hat{\alpha}$ on the basis of only partly observed financial distress yields inconsistent estimates. I correct for the potential bias using a selection equation as suggested by Heckman (1979) and applied for dichotomous variables by Van de Ven and Van Praag (1981). The regression of the subsample of partly observed distressed firms can be written as:

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

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

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

with

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

where h and H are the probability distribution function and H the cumulative distribution function. The regression function can be rewritten as

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

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 can be consistently estimated as $\hat{\lambda}$ based on the estimates of $\hat{\beta}$ of the probit *Selection Equation*.

4.2 Estimation Results and Discussion

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

Table 6 reports the estimates of the bivariate selection equation. The correlation coefficient $\hat{\rho}$ is found to be significant different from zero at the 1% level. Estimates obtained from a normal probit model are likely to be inefficient. *Branch Quality* is found to be negative, suggesting that branches with lower investigation quality are less likely to observe firms in financial distress, as expected. If Creditreform either investigated a firm again, recently, or is commissioned to collect debt, firm information is more accurate and it is more likely that financial distress is observed. Both variables, *Investigation* and *Debt Collection* are found to be positive. Dummy variables indicating missing information about age and industry are found to be negative significant. For firms listed in business register information is publicly available and investigation costs are reduced. Harhoff et al. (1998) find that high-risk firms are more likely to choose limited liability as the legal form. Therefore

it is more likely that these firms get financially distressed. In addition it is more likely that these cases are observed, since limited liability firms need to be registered and more public information is available. Surprisingly, *Business Register* is found to be negative.

I now turn to the firm survival equation. Table 1 provides marginal effects of selected variables. Table 7 shows the models coefficients and Table 8 the full list of marginal effects. Empirical findings support the hypotheses that lending strategies for financially 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*.

The effects are even stronger for cooperative banks than for public banks. This might be for two reasons. Since cooperative banks are traditionally involved in financing small firms, they are well diversified and are able to compensate potential losses. Second, most customers of cooperative banks are also members.[14] Although the members' personal influence is limited since votes are mostly restricted to individuals rather than shares, other entrepreneurs might get elected to join the cooperative banks board of supervisors and other committees deciding on investment guidelines.

Compared to other *Banking and Finance* variables, such as *Real Estate* or the entrepreneurs human capital (*Master Craftsman* or *Academic*) the effects on public or cooperative banks are weaker. However, differences between firms' survival probability among bank types can be interpreted as economically significant, since the model control for economic factors of firms' market exit and all banks act under the same, strict regulation scheme.

The reason for the observed differences in lending strategies among bank types remains unclear. Matthey (2008) argues that private banks adopt a hard-nosed lending strategy in order to attract low risk firms. If this hypothesis is empirical valid, public bank's credit portfolio would need to show higher risk compared to private banks.

[14] Until the 1970s cooperative banks were allowed to provide financial services for members only.

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 Germany	0.054***	0.057***	0.055**	0.052***	0.053***
	(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; $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$

In contrast to Paul et al. (2003), who estimated bank's portfolio risk based on self-reported risk profiles by entrepreneurs, this cannot be 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.[15] Cooperative banks show the lowest credit risk portfolio. If one assumes that private banks finance larger firms, the risk exposure of private banks' credit portfolio is even higher.

Banks active in less concentrated markets are better able to skim future profits and should be more likely to keep financing financial distressed firms. As the number of banks active in a district decreases and concentration therefore becomes higher, firm's probability of 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, the significance is weak and varies across periods, since there is low variation in concentration across districts. The measurement could be also improved by taking the bank's market share in corporate finance into account.

There are further interesting findings, concerning firm's financing behavior and internal factors influencing debt renegotiation as the underlying process of firm's 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 of exiting the market. The same is observed for firms that are managed by at least one person that holds a master certificate or university degree. Either educated managers 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. The probability of market exit reduces as the number of managers increases.

[15] Results of estimates of the cumulative distribution and kerneldensity using the overall rating are similar.

There is a dynamic effect for a 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 the probability of surviving financial crises increases substantially. The highest age class is an exception. Firms that age 50 years or older show a higher probability of exiting the market compared to young firms. This might reflect difficulties in transferring business to another generation. Second, even ten to fifteen years after the reunification firms located in East 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 The 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). However, as time goes by after financial distress the effect reduces indicating that it takes longer to observe voluntary 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 only if related characteristics implemented by Creditreform can be observed. A proper assumption would be that firms which were not investigated or the 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 these firms.

In addition to firms exiting the market after financial distress the panel also contains observations on firms that fail without a 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. They need to file for bankruptcy, while bankruptcy is for balance sheet rather than for solvency reasons. Logically, a 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 hypothesis of self-selection of firms according to their risk to a certain bank type stated by Matthey (2008) is valid, the probability of distress is higher for firms financed by public and cooperative banks, respectively. The question arises whether bank dummies are endogenous. This should not be the case for the model presented here. The model is restricted to financially distressed firms only. In most cases the firm's choice of a financing partner has been made a long time ago. Further, the firms viability does not depend on that choice. For robustness check the deteriorating state of firm's credit rating is used as the dependent variable. Information concerning credit rating is produced by Creditreform indicating the firm's credit worthiness that is a part of the overall rating. Results remain stable and are provided by the author on request.

5 Conclusion

Survival of financially distressed firm's depends on their access to finance. Banks need to re-audit these firms and decide whether to keep financing or liquidating even viable firms. The bank's strategy financing financially distressed firms depends on several factors. It is influenced by the liquidation value, the value of collateral, the possibility to gain inside information and control over firm's assets. It might also depend on the bank's type. Public

and cooperative banks have a mandate supporting regional economy and are especially involved in corporate finance of local and small or medium sized firms. Therefore, their investment in sector specification might differ compared to private banks.

With this paper I have explored whether differences in lending strategies among bank types exist. I estimate the probability of a market exit for financially distressed firms, depending on the type of the firms main financing institution. I control for firm's financing behavior, as well as for further internal and external factors that influences the probability of exiting the market, such as firm age, firm size, or entrepreneurs educational background.

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. The reason for this behavior remains unclear. Private banks might have incentives to compete in repayments rather then interest streams. They could act as hard-nosed bankers and adopt stricter rules if firms get financial distressed or rule out renegotiation at all. High-risk firms anticipating that behavior would self-select to public or cooperative banks. This is not supported by the finding of a riskier credit portfolio of private banks, based on an analysis of firms' credit scores, indicating that private banks take on higher risk in the first place. 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:	Total Assets	Corporate Finance
Private Banks	**39.8%**	**44.0%**
Real Estate Credit Institution	12.8%	13.6%
Commercial Banks	27.0%	30.4%
Public Banks	**40.1%**	**35.3%**
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[16]	Public Banks
4.	Development Banks	Public development banks are governmentally owned and operate either on Länder or federal level[17]	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

[16]Following 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

[17]Following 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[18]	Private Banks
10.	Central Bank for Cooperative Banks	Clearing houses for cooperative banks. Banks jointly owned by cooperative banks[19]	Cooperative Banks

Note: The list presents banks and bank groups according to the classification of the German banking code by the Deutsche Bundesbank.

[18] Dresdner Bank AG merged with Commerzbank AG in 2008.

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

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).

Table 5: Description of Variables

Variable	Description	E. Sign	Mean	SD
Banking & Finance				
Private Banks	= 1 if a private bank is the main financing partner	+	0.256	0.437
Public Banks	= 1 if a public bank is the main financing partner	-	0.477	0.499
Cooperative Banks	= 1 if a cooperative bank is the main financing partner	-	0.267	0.442
Banking Market Concentration	$= \frac{1}{\text{no. of banks active in the district}}$	?	0.080	0.055

Variable	Description	E. Sign	Mean	SD
No. of Bank relations	= number of bank relations	?	1.281	0.594
Debt Collection	= 1 if CREDITREFORM is commissioned to collect debt from the particular firm	+	0.113	0.596
Real Estate	= 1 if either residential, industrial or mixed property is owned	-	0.348	0.432
History of Distress	= $\sum$ of situation of distress within the sample period	+	1.295	0.317
Internal Factors				
Business Register	=1 if companies need to be registered due to legal form	-	0.270	0.444
Size	= number of employees	Con.	8.389	92.409
Age 1	= 1 if firm age is between 0 and 2	Con.	0.063	0.244
Age 2	= 1 if firm age is between 3 and 6	Con.	0.263	0.440
Age 3	= 1 if firm age is between 7 and 12	Con.	0.293	0.455
Age 4	= 1 if firm age is between 13 and 19	Con.	0.163	0.369
Age 5	= 1 if firm age is between 20 and 49	Con.	0.126	0.332
Age 6	= 1 if firm age is 50 or older	Con.	0.092	0.289
Management Team	= number of persons belonging to the management board	-	1.064	0.286
Management Team M	= number of persons belonging to the management board unknown	Con.	0.114	0.317
Master Craftsman	= Master certificate received from the chamber of industries and commerce or the chamber of crafts is the highest educational degree	-	0.120	0.325
Academic	University degree (either a German diploma, degree of doctor, or professorship) is the highest educational degree	-	0.115	0.320
External Factors				

Variable	Description	E. Sign	Mean	SD
Δ local Insolvencies	= the insolvency in a particular district compared to previous year	+	9.205	27.815
East Germany	= 1 if firm is located in East Germany	+	0.301	0.458
Industry 1	= 1 Cutting Edge Technology	Con.	0.004	0.063
Industry 2	= 1 if High Technology	Con.	0.008	0.091
Industry 3	= 1 if Manufacturing	Con.	0.078	0.263
Industry 4	= 1 if Technology-intensive Services	Con.	0.041	0.198
Industry 5	= 1 if Consultancy	Con.	0.035	0.185
Industry 6	= 1 if Industry-related Services	Con.	0.041	0.197
Industry 7	= 1 if Consumer Services	Con.	0.192	0.395
Industry 8	= 1 if Energy and Mining	Con.	0.191	0.023
Industry 9	= 1 if Construction	Con.	0.062	0.393
Industry 10	= 1 if Retail and Wholesale	Con.	0.289	0.453
Industry 11	= 1 if Transportation	Con.	0.062	0.240
Industry 12	= 1 if Postal and IT Services	Con.	0.004	0.060
Industry M	= 1 if Industry code is unknown	Con.	0.054	0.225
Year 2000	= 1 if year is 2000	Con.	0.122	0.327
Year 2001	= 1 if year is 2001	Con.	0.135	0.342
Year 2002	= 1 if year is 2002	Con.	0.167	0.372
Year 2003	= 1 if year is 2003	Con.	0.180	0.384
Year 2004	= 1 if year is 2004	Con.	0.207	0.405
Year 2005	= 1 if year is 2005	Con.	0.189	0.392

Variable	Description	E. Sign	Mean	SD
Selection Equation				
Branch Quality	= Research Quality of Creditreform branches per period		-0.004	0.993
Investigation	= 1 if Creditreform investigated the firm within that period		0.119	0.299
Business Register	= 1 if companies need to be registered due to legal form		0.236	0.449
Debt Collection	= 1 if Creditreform collects debt from this particular firm		0.022	0.160
Industry M	= 1 if Industry code is unknown		0.156	0.377
Age M	= 1 if date of foundation is unknown		0.136	0.415

Table 6: Model Results - Part 1 Selection Equation

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

Robust clustered (firm) standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 7: 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)
ln Size	-0.009	0.0247	0.053**	0.076***	0.104***
	(0.019)	(0.021)	(0.021)	(0.021)	(0.022)
ln Size^2	0.058***	0.049***	0.041***	0.030**	0.015
	(0.012)	(0.013)	(0.013)	(0.013)	(0.013)
ln 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***	-0.298***	-0.356***	-0.391***	-0.416***
	(0.023)	(0.024)	(0.025)	(0.026)	(0.026)
Age 6	0.483***	0.378***	0.313***	0.266***	0.234***
	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)
Management	-0.100***	-0.121***	-0.132***	-0.142***	-0.153***
Team	(0.0181)	(0.019)	(0.020)	(0.020)	(0.021)
Management	-0.224***	-0.245***	-0.257***	-0.275***	-0.282***
Team M	(0.026)	(0.028)	(0.029)	(0.029)	(0.030)
Master	-0.090***	-0.089***	-0.097***	-0.109***	-0.115***
Craftsman	(0.016)	(0.017)	(0.018)	(0.018)	(0.019)
Academic	-0.065***	-0.062***	-0.074***	-0.083***	-0.095***
	(0.016)	(0.017)	(0.018)	(0.018)	(0.019)
External Factors					
Industry	Yes***	Yes***	Yes***	Yes***	Yes***
East	0.124***	0.134***	0.129***	0.123***	0.127***
Germany	(0.011)	(0.012)	(0.013)	(0.013)	(0.013)
Δ local	0.0006***	0.0008***	0.0006***	0.0005***	0.0005***
Insolvencies	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Year	Yes***	Yes***	Yes***	Yes***	Yes***
Constant	-2.078***	-1.776***	-1.542***	-1.365***	-1.166***
	(0.055)	(0.061)	(0.065)	(0.066)	(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; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

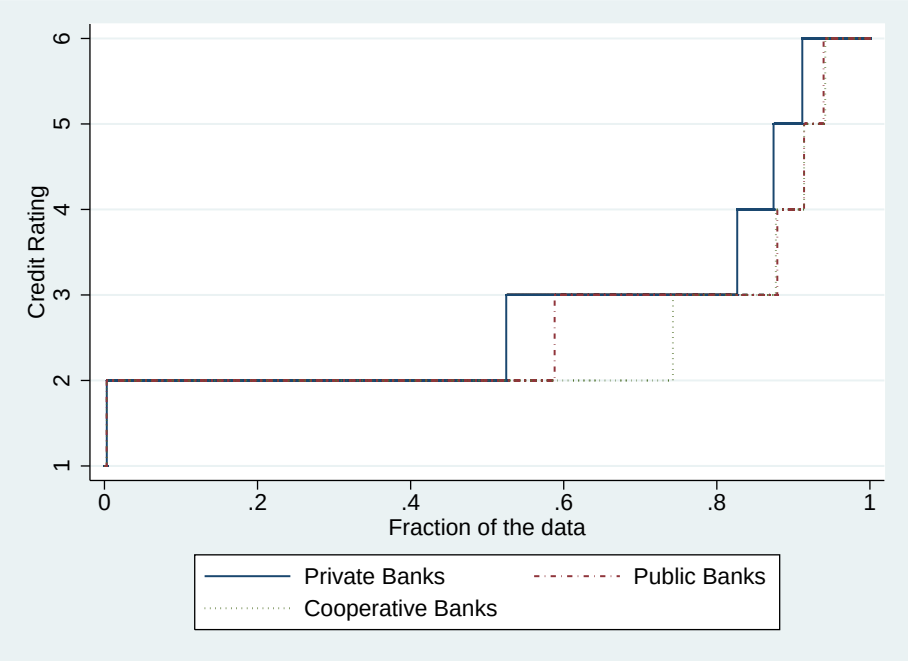
Table 8: Marginal Effects

	(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	-0.004	-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	-0.008**	-0.008**	-0.007	-0.006	-0.006
bank 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 Factors					
Business	0.316***	0.291***	0.268***	0.247***	0.225***
Register	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
ln Size	-0.004	0.010	0.022**	0.032***	0.043***
	(0.008)	(0.009)	(0.009)	(0.009)	(0.009)
ln Size^2	0.025***	0.021***	0.017***	0.013**	0.007
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
ln Size^3	-0.005***	-0.005***	-0.004***	-0.004***	-0.003***
	(0.0008)	(0.0008)	(0.0008)	(0.0008)	(0.0008)
Age 2	-0.019**	-0.042***	-0.051***	-0.055***	-0.057***
	(0.008)	(0.008)	(0.008)	(0.009)	(0.009)
Age 3	-0.061**	-0.096***	-0.115***	-0.128***	-0.137***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Age 4	-0.084***	-0.116***	-0.136***	-0.150***	-0.160***
	(0.008)	(0.008)	(0.008)	(0.008)	(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***	-0.116***	-0.138***	-0.154***	-0.164***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Age 6	0.219***	0.164***	0.134***	0.114***	0.099***
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Management	-0.043***	-0.051***	-0.055***	-0.060***	-0.065***
Team	(0.008)	(0.008)	(0.008)	(0.009)	(0.009)
Management	-0.092***	-0.099***	-0.104***	-0.112***	-0.115***
Team M	(0.010)	(0.010)	(0.011)	(0.011)	(0.012)
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)
External Factors					
Industry	Yes***	Yes***	Yes***	Yes***	Yes***
East	0.054***	0.057***	0.055**	0.052***	0.053***
Germany	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)
Δ local	0.0003***	0.0003***	0.0002***	0.0002***	0.0002***
Insolvencies	(7.3e-5)	(7.5e-5)	(7.4e-5)	(7.4e-5)	(7.5e-5)
Year	Yes***	Yes***	Yes***	Yes***	Yes***
No. of Obs.	4,723,708	4,723,708	4,723,708	4,723,707	4,723,706

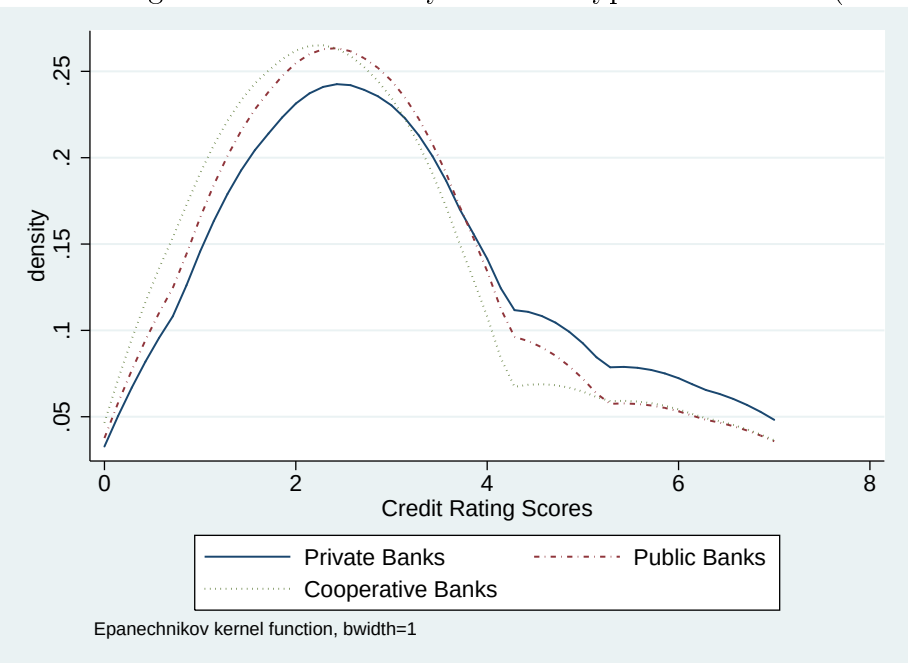
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

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)