DISCUSSION PAPER SERIES

No. 3030

CORPORATE DEBT RESTRUCTURING: EVIDENCE ON LENDING COORDINATION IN FINANCIAL DISTRESS

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FINANCIAL ECONOMICS

Centre for Economic Policy Research

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ISSN 0265-8003

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Discussion Paper No. 3030
October 2001

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CEPR Discussion Paper No. 3030

October 2001

ABSTRACT

Corporate Debt Restructuring: Evidence on Lending Coordination in Financial Distress*

We analyse the coordination problem in multi-creditor relationships empirically, relying on a unique panel data set that contains detailed credit-file information on distressed lending relationships in Germany, including information on creditor pools, a legal institution aiming at coordinating lender interests in borrower distress. We report three major findings. First, the existence of creditor pools increases the probability of workout success. Second, the results are consistent with coordination costs being positively related to pool size. Third, major determinants of pool formation are found to be the number of banks, the distribution of lending shares, and the severity of the distress shock.

JEL Classification: D74, G21, G33 and G34
Keywords: bank lending, coordination risk, distress and workout

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* This research is part of the CFS project on Credit Management in Germany. We thank all participating banks for the intensive cooperation in this project. We have also benefited from discussions with Hans Degryse, Doug Diamond, Ralf Elsas, Karl-Hermann Fischer, Nicolas Kiefer, Kjell Nyborg, Steven Ongena, Hyun Shin and conference and seminar participants in Frankfurt, London (FMG), Tilburg, Vienna, and Zurich. This Paper is produced as part of a CEPR research network on 'Understanding Financial Architecture: Legal and Political Frameworks and Economic Efficiency', funded by the European Commission under the Research Training Network Programme (Contract No: HPRN-CT-2000-00064).

Submitted 28 September 2001

1 Introduction

Much of the recent literature on the pricing of debt and on the design of debt contracts evolves around a common theme that is coordination risk and its anticipation by borrowers and lenders. Coordination risk describes the potential costs and the inefficient decision-making associated with the difficulties that lenders encounter when their common debtor is in trouble. Consider a firm with several large lenders, or banks, which is facing a downturn of demand. Given the nature of the credit contract, it may then be optimal from an individual creditor's point of view to demand early repayment of the outstanding amount, and thus to place its own claim at the front of the queue. If all debtors demand early repayment at the same time, the firm will be in trouble, even if the underlying investment is in fact sound. What is lacking in such a situation is coordination among creditors. Without it, the firm faces the risk of a corporate run, similar to a bank that is threatened by a run of its depositors. In a game theoretic framework, coordination failure arises in unanimity games, when cooperation is welfare increasing, while individual, pre-emptive action may be the only stable equilibrium. In an attempt to understand the EMS crisis of 1992-93, Obstfeld [1996] has presented an explanation for financial attacks on national currencies that builds on the logic of the bank run. In a series of papers, Morris and Shin [1998, 1999] have developed a model that allows them to analyze the structure of run-type problems on financial markets in greater detail. In Morris and Shin [1999], the coordination failure among lenders is modeled as a multi-lender credit decision under imperfect information. The authors study the dynamic properties of default triggers when borrowers' asset values are a function of creditor behavior. The special emphasis on coordination failure is the major innovation of the above literature, since it opens an avenue of research relating to the occurrence of financial crises, and to the implications of financial market regulation.

In this paper, we make use of a unique data set that contains detailed credit file information sampled from six leading German banks. It contains

a comprehensive array of lending-related data on medium-sized corporates that were in distress at least once during the period 1992-1997. The basic objective of our study will be to explore how these banks typically behave in the event of a corporate distress. The major questions asked are: "Do banks systematically coordinate their interests, and if so, how is lender coordination achieved? Second, and most importantly, what real economic consequences are associated with lender coordination, and what are its major determinants? Finally, is the success of a workout predictable, and if so, what determinants matter?". To clarify terms, we define lender coordination as a detailed contractual arrangement, possibly informal, about the distributions of future commitments and claims among a group of (bank-) creditors which, before entering into the contract, operated on a stand-alone basis. Thus, a syndicated loan is not the type of lender coordination we will be looking at. As it turns out, over the past decades the banking industry in Germany has developed a widely accepted and fine tuned contractual arrangement (set of rules) that harmonizes lender interests in cases of borrower distress. Entering into this contract effectively transforms a multitude of independent lenders into a single decision entity. This unification of interests is achieved by forming a so-called creditor pool. Our data set allows us to identify why these creditor pools were formed, if at all, and what impact they exerted on workout decisions and, in particular, on workout success.

The results of our study support the predictions by Obstfeld [1996], Morris and Shin [1998, 1999], among others[1]. We find explicit lender coordination at the onset of corporate financial distress to be widespread. Coordination is achieved through the formation of creditor pools. The existence of these pools renders workout activities by banks more likely and it significantly increases the unconditional probability of a successful turnaround during a reorganization process. Lender coordination is therefore welfare improving. We will proceed as follows. Section 2 gives a brief account of the relevant literature and motivates our special interest in the question of lender coordination. Section 3 presents our data set and contains an informal description

[1] See also Heinemann/Illing (1999), Hubert/Schaefer (1999).

of the contractual institution known as *collateral pool* in Germany, which will also be our major variable for capturing the presence or absence of lender coordination. Section 4 states our major hypotheses. Section 5 reports the results of the econometric tests and discusses our findings. Section 6 concludes.

2 Coordination risk and debt restructuring: review of the literature

The literature on corporate debt restructuring has typically concentrated on those attributes of the renegotiation process that are relevant in distress situations. Thus, Gertner and Scharfstein [1991] argue that bank debt is much easier to reorganize than public debt and that the structure of debt with respect to both maturity and priority has important effects on the restructuring decision. If bank debt is junior, and liquidation is imminent, the lender will be more willing to renegotiate. Edwards and Fischer [1994] emphasize the role of information-intensive housebank relationships for facilitating a minimum level of cooperation between different bank lenders. Repullo and Suarez [1998] stress the role of liquidation threats by an informed lender as an incentive device. The authors predict that informed lenders will hold secured debt and will be senior to uninformed debt. Similar conclusions are reached by Welch [1997]. In a model with many creditors, Hege [1997] finds that the probability of successful renegotiation decreases as the number of lenders increases. Renegotiation with a single lender is a second best solution, since the lender's willingness to forgive debt is positively related to the size of his position. On the other hand, small lenders are better off free-riding on the renegotiation incentive of larger lenders and thus will not forgive debt. In a model of syndicated lending, Preece and Mullineaux [1996] find that the number of lenders in a syndicate influences its ability to renegotiate a loan. Large syndicates have high transaction costs and are relatively inflexible in the bargaining process. In a recent paper, Berglöf, Roland, and von Thadden [2000] argue that with multiple creditors, a debtor can commit himself

to higher repayment than is actually consistent given his asset values. The rules of the bankruptcy code are of special importance here as they define the joint expectations of the parties involved. The renegotiation process between lenders and their common debtor is modeled in a recent paper by Morris and Shin [1999]. Their argument builds on the Diamond and Dybvig [1983] model of a bank run and finds that pre-emptive action by lenders, i.e. a premature cancellation of loans in order to save the lender's own position, may lead to an inefficient liquidation of firms. The authors postulate that in equilibrium the risk of a corporate run will be reflected in the market credit spread. Thus, there will be a return premium related to the probability of pre-emptive action. Morris and Shin argue that a corporate run can be avoided only if stable coordination is established. In general, however, coordination is hard to sustain if bankruptcy becomes more likely. Since the corporate run is a problem of strategic action (and actually of a first mover advantage), rather than of asymmetric information, an increase in transparency alone does not necessarily improve the situation. In a related paper, the authors have shown that coordination remains difficult even if the information is common knowledge to every player [see Morris and Shin 1997]. Extensions of the Morris and Shin [1999] model can be found in Heinemann and Illing [2000], and in Hubert and Schaefer [2000]. The latter paper interprets coordination failure as the cost of diversified lending, which is balanced off against other advantages of diversified lending, notably the reduced bargaining power of creditors. Longhofer and Peters [1997] provide a theoretical explanation for a bankruptcy law solving the coordination problem among creditors. Finally, Longhofer and Santos [2000] emphasize the role of (close) lending relationships particularly in times of distress. In their model, relationship lenders can assess the true quality of a firm in financial distress and thus, make it easier for high quality firms to obtain additional financing. The authors show in their model that seniority of bank debt encourages the formation of such bank-firm relationships.

On the empirical side, the study by Gilson, John, and Lang [1990] analyzes a sample of 169 financially distressed US firms. About one half of these companies have restructured their debt outside Chapter 11 of the US

Bankruptcy Code. The authors identify systematic differences between these firms. Thus, firms are more likely to restructure out of court (out of Chapter 11), if they have more intangible assets, if the share of bank debt in total debt is high, and if the number of (bank) lenders is comparatively small. Their results are supportive of the view that private debt restructuring requires, in order to be successful, low expected bargaining costs (thus a small number of lenders) and a strong bargaining position (thus provision of a relatively large proportion of overall debt). The authors find a positive wealth effect for shareholders if restructuring is organized privately, rather than via Chapter 11 reorganizations. Asquith, Gertner, and Scharfstein [1994] compare out of court settlements and Chapter 11 reorganizations in a sample of distressed junk bond issuers. Their major finding is that a firm's pre-distress debt structure has real effects on the way financially distressed firms restructure. Secured private debt plus subordinated public debt impedes private restructuring. Asset sales can be a way to avoid Chapter 11, provided that the industry as a whole is not in distress as well (thus scaling down a second hand market for productive assets). The authors make clear that not only the level of debt, but also the composition of debt is a descriptive statistic of corporate capital structure that has real consequences, notably in the case of distress. They suggest that firms may choose their debt structure in order to minimize ex-ante distress costs. In a related paper, Gilson [1997] analyzes the changes in capital structure brought about by distress events. Again, he compares out of court restructuring with Chapter 11 cases. In separate analyses of these two sub-samples, he identifies a number of explanatory factors for the type of capital structure changes observed in his sample. The author uses various proxies to measure transaction costs of debt restructuring. He finds significantly lower costs associated with Chapter 11 transactions, as compared to out of court restructurings, which, according to Gilson, suggest a higher degree of financial flexibility under the shield of Chapter 11. A recent paper by Elsas and Krahnen [2000] has addressed the issue of collateral and relationship lending. They rely on a credit-file data set that has been sampled from six major German banks and that is a smaller version of the one used in this paper. The authors find support for the hypothesis

advanced by Longhofer and Santos [2000] and Welch [1997], showing that collateral is systematically accumulated in the hand of the (single) house-bank, thereby strengthening their possible future role as the leading bank in a private workout situation.

Our own analysis in this paper is probably closest in spirit to Gilson, John, and Lang [1990]. Like them, we analyze a sample of financially distressed firms, and we identify explanatory variables for the incidence of lender coordination and for the success of private workouts. Unlike them, however, we concentrate on private rather than public debt restructuring. For this purpose, we use first-hand credit-file data of banks involved in the restructuring. Furthermore, we explicitly address the question of lender coordination, or the failure thereof.

Overall, we find that theoretical work has recently started to look in greater detail into the bargaining process surrounding corporate distress. Existing models predict that the failure of lender coordination is a serious problem, having real consequences with regard to a possible reorganization of distressed borrower, and the firms' future performance. Furthermore, in anticipation of the direct and indirect bargaining costs, firms' debt structures and attributes of relationship lending are optimally chosen to minimize expected bargaining costs. These costs include direct costs related to the bargaining process, and indirect costs related to non-optimal restructuring decisions. In the next section we describe our data set and include a description of creditor pools, a bargaining institution which will play an important role in our empirical test of lender coordination later on.

3 Data set and descriptive statistics

3.1 General characteristics of the data set

This study relies on the CFS Loan Data Set, collected under the Center for Financial Studies' research project on Credit Risk Management (see Elsas et al. 1998 for a detailed account of the structure of the data set). The data underlying our analysis include distressed and potentially distressed

corporate debtors of the following six major German banks: Bayerische Vereinsbank (now HypoVereinsbank), Commerzbank, Deutsche Bank, Deutsche Genossenschaftsbank (DG Bank), Dresdner Bank, and Westdeutsche Landesbank (WestLB). The data set contains:

- general firm characteristics (e.g. legal form, industry),
- a complete overview on loan contracts and their specific terms (e.g. credit volume, maturity, collateral),
- balance sheet data,
- the bank's own risk assessment (internal rating),
- measures of workout and liquidation with respect to distressed borrowers, and
- information on creditor pools.

This information was collected in two stages directly from the banks' credit files (first stage: banks 1-5; second stage: banks 2,5,6). Our data is a random sample with observations ranging from 1991 up to 1997 (1999 in the second stage) drawn from a population of all corporate customers who met a number of selection criteria at least once in the core time period 1992-1997.

- First, companies had to be medium-sized, i.e. with an annual turnover between DM 50m and DM 500m (EUR 25-250m). Due to the absence of surveillance by rating agencies and the lack of rigorous disclosure requirements, we expected this company size segment to be subject to a significant degree of asymmetric information between lenders and borrowers, thus constituting a prime population for the analysis of issues related to relationship lending, loan contract design, and renegotiation.
- Second, to ensure a minimum level of information regarding the clients' total bank debt and the number of the borrower's bank relationships, a minimum total loan size of DM 3m (EUR 1.5m) was imposed. All

loans surpassing DM 3m are subject to the regulatory notification requirement of Article 14 of the KWG (German Banking Act), and have to be communicated to a national credit supervisory agency (BAKred).

- Third, clients with registered offices in the former GDR (East Germany) were excluded.

- Fourth, to generate a sample of potentially distressed borrowers, borrowers to be included in the sample had have faced a poor internal rating at least once between 1992 and 1997. A poor rating means a rating of 5 or 6 on a standardized rating scale ranging from 1 (highest grade) to 6 (lowest grade) for all banks in this sample. The poor rating categories 5 and 6 indicate that banks expect these borrowers to be problematic, i.e. potentially distressed, or distressed.

The generated sample includes 124 borrowers and a total number of year-end observations of 597.[2] Table 1 shows the frequencies of credit files collected from each bank.

Bank[3]	1	2	3	4	5	6	total
Frequency	16	30	14	16	28	20	124

Table 1: Number of observed borrowers per bank

Grouped according to industry sectors, Table 2 shows that the majority of firms came from the sectors engineering (33) and manufacturing (30).The third largest sector is trade with a total of 17 firms in our data set. Other sectors are rather minor.

3.2 Firm size and debt structure

The major sample selection criterion refers to company size, proxied by annual sales, representing medium-sized industry. Annual sales had to be larger than DM 50m and smaller than DM 500m (EUR 25-250m). In our sample

[2]When there is more than one observation per year we only considered the last observation. However, we cumulate the information on distress measures taken by the bank over all observations in the respective year.

Industry sector	Number of sample firms
Engineering	33
Manufacturing	30
Trade	17
Construction	9
Transportation	5
Services	4
Energy	4
Others	22
Total	124

Table 2: Sample firms by industry sectors

of 124 distressed firms, the average company size is DM 144m (EUR 72m), with a median of DM 104m. For this size class, German firms typically have not issued any public debt instruments. The average debt-to-assets ratio is 0.71, the bank-debt to total-debt ratio is .77. The remainder comprises other forms of debt, e.g. trade credit and debt given by owners. This fraction of bank debt is considerably larger than the ratio in a comparable representative sample, where the average bank debt is about 50 per cent of total debt. With respect to the number of bank relationships, however, there is no significant difference between these samples[4]. As can be seen from Table 3, firms tend to borrow from several banks, with a mean value of 6 and a median of 5 (with a minimum of 1 and a maximum of 30).

	mean	median	std.dev.	obs.
annual turnover (m DM)	144.31	104.11	139.34	121
total assets (m DM)	121.16	69.06	155.92	121
total debt (m DM)	73.15	47.03	86.41	121
total bank debt (m DM)	61.21	36.60	77.58	109
debt-to-assets ratio (per cent)	.71	.71	.23	121
banks' debt share (per cent)	.77	.86	.25	107
number of banks	6.04	5.00	4.35	117

Table 3: Descriptive statistics on firm size and debt structure

[4]See Elsas/Krahnen 2000 and Machauer/Weber 1998 for descriptive statistics relating to the representative sample.

3.3 The identification of housebanks

The housebank variable is assigned a value of one whenever decisions taken by the bank in question were explained, in the credit files, using arguments explicitly relating to its housebank status (e.g. "we are the housebank", "we are the main bank", "we have a special responsibility", etc.). The resulting housebank attribution thus differs substantially from other measures of relationship intensity used in the literature, such as duration or the number of bank lenders. We believe our attribution to be a more reliable indicator, since it is directly based on the internal judgment of one of the parties to the implicit contract. The sample of problematic or distressed borrowers used in this study contains 45 housebank relationships and 79 non-housebank relationships. In Table 4, the number of bank relationships is related to the housebank attribution, where HB=0 is the normal bank relationship, while HB=1 refers to the housebank relationship.

		HB		
		0	1	total
#banks	1	0	6	6
	2-3	9	19	28
	4-7	42	13	55
	8+	23	5	28
	total	74	43	117
	(missing)	(5)	(2)	(7)
	mean	7.068	4.279	6.043

Table 4: Cross-table of housebank attribution and the number of banks

The mean number of bank relationships is significantly higher in the case of normal bank relationships than in the case of housebanks. About 60% of all companies with HB=1 have at most 3 banks, while for normal banks this fraction is only 12%. Of course, we cannot rule out that in a given normal bank relationship there is a different bank acting as the relevant housebank, although the probability may be smaller than one.

3.4 Internal ratings

An important characteristic of our data set concerns the internal ratings of the lending institutions. Each bank in our sample uses its own rating system in order to assess at regular intervals the probability of default of its borrowers . The standard methodology relies on a scoring system with up to five different main criteria, including quantitative and qualitative information about firm performance and prospects, and a linear weighting system with both fixed and varying weighting factors depending on the bank in question [see Brunner, Krahnen, and Weber 2000 for details]. Our data set includes rating information on every borrower and for each observation recorded in the files. Ratings are believed to reflect expected default probabilities, as seen by the banks, as an unbiased estimate. As long as internal ratings remain private information of the bank, i.e. as long as rating information is not communicated to either the management of the rated firm, or to some supervisory body, there is no inherent incentive of the bank to misrepresent the information available in any systematic way. Internal ratings are thus expected to be informationally efficient [see Krahnen and Weber 2001]. In the subsequent empirical analysis we assume internal ratings to be efficient and unbiased. The ratings of different banks representing different rating scales have been standardized in a transformed rating scale with six rating grades, in which grades 5 and 6 describe borrowers that are either potentially distressed (problematic), or actually distressed.

3.5 Credit Event

The time when a borrower's internal rating is downgraded by the bank to a standardized rating class of 5 or 6 for the first time in our data set is labeled the credit event. The credit event thus describes the onset of financial distress. For some of the banks in our sample, the credit event corresponds with the time when competence for a certain client is transferred from the local credit authority to the workout group on the regional level (other banks may not have implemented such workout groups yet). The workout group has specific expertise regarding the reorganization, and also liquidation, of

borrowers. At the onset of financial distress, the event rating, which can either be rating class 5 or 6, also measures the severity of the distress shock. In our sample, we find 101 rating downgrades to rating 5 and 23 rating downgrades to rating 6 where the latter also include cases in which liquidation starts right away with no attempt at reorganization.

3.6 Bank behavior in distress

The onset of financial distress measured by the credit event typically goes along with the bank adjusting its behavior vis à vis the firm to the new information. Bank measures in a distress situation may include

- *Loosening* the firm's financial constraints by postponing due repayments and interest payments or even providing additional funds (fresh money) to help the firm overcome a liquidity shortage.
- *Tightening* the firm's financial constraints by reducing credit lines, terminating individual loans or requiring additional collateral in order to discipline the firm's management.

However, loosening and tightening measures are not necessarily mutually exclusive. The bank may, for example, provide fresh money and require additional collateral at the same time. Additionally, the bank reacts to declining borrower quality in ways not directly related to the size and structure of loan agreements, for instance by increasing its monitoring of the borrower. The term 'workout' is commonly used describing the banks' effort to carry on the lending relationship to a distressed or potentially distressed borrower. It may include the postponement of repayments due, fresh money, reorganization plans, and advisory services.

3.7 Creditor pools

While preparing the data set underlying our analysis we became aware of an institutional arrangement, widely used in German banking, that serves the purpose of coordinating lender decision making in the event of a borrower

distress. From this perspective, creditor pools are an instrument to facilitate workout. We will call it *Creditor Pool* throughout, although practitioners use the term *Banking Pool* and *Collateral Pool* as well. Creditor pools are formal contractual arrangements in which a group of lenders, usually banks, transfer their individual claims vis-à-vis a particular borrower. In general, only unsecured claims are handed over to the pool. In return, each member of the pool receives a pool quota, which stipulates the proportion to which she will participate in future money outflows and money inflows (recoveries) of the pool. Should the creditor pool decide to grant additional credit to the borrower, then fresh money is provided by all pool members in proportion to their quotas. Similarly, if the borrower is able to make loan repayments, then the cash will be paid out to pool members in proportion to their quotas, too. The creditor pool is typically formed at the onset of a financial distress. If one lender, perhaps from observing a tightening of the liquidity status of a customer, foresees an imminent financial distress, she will contact some or all other lending banks involved with this firm. The creditor meeting then decides whether or not to form a creditor pool, and if so, what quotas to assign. The bank holding the largest quota becomes the pool leader. It is typically, but not necessarily, the housebank of the firm. From this time onwards the pool leader represents the pool vis-à-vis third parties. The pool's decision-making depends on the voting rule fixed in the pool arrangement. For the borrower, the debt structure is thus transformed from a multi-lender to a single-lender debt structure with regard to the debt provided by the pool banks.

Further details of the pool arrangement comprise

- Member banks

  In general, all banks who have a lending relationship with the borrower are supposed to enter the pool. Empirically, this can mean any number of banks from two up to thirty or even more. Other creditors, such as trade creditors, may also participate in the pool, then called a super pool, if they possess the ability to force the borrower's bankruptcy.

- Pool loans

Usually, banks only contribute their uncollateralized loans to the pool because heterogeneous collateralization of loans would lead to bargaining problems that are difficult to solve. If a collateral pool for syndicated bank loans previously existed, the creditor pool will usually include all these collateralized pool loans.

- Pool quotas
  Pool quotas are determined by the time the pool contract is signed and remain constant afterwards except for contract renegotiation. The quota does not necessarily equal the share of pool loans contributed by the respective bank; it might also depend on the type of loans. Typically, the pool quotas are the solution of a bargaining process among member banks.

- Voting rules
  In general, important decisions taken by the creditor pool such as, for instance, those relating to the provision of fresh money, or the liquidation of borrower assets, require consensus among all member banks. Deviations from this rule [like majority voting] may be agreed upon in the pool contract.

- Pool leader

  The bank with the largest pool share is nominated to be the lead bank or pool leader. It is the duty of the pool leader to lead the workout, monitor the borrower's actions and evaluate the pool collaterals on behalf of the member banks.

- Termination of pool contract

  The pool contract is terminated when either the reorganization of the borrower has been successfully completed, or when the borrower has been liquidated. Also, each bank has the right to terminate the contract, which does not necessarily lead to a liquidation of the borrower or of the pool. Terminating the pool contract by only one bank can involve a worsening of this bank's position, since the contracted payoff

to the leaving bank might be lower than the current value of its pool share. Therefore, the pool contract is more binding than an alternative status quo agreement. Usually, the leaving bank loses its claim on pool collateral, or part of it.

Why does the creditor pool come into existence, and why is it apparently quite stable over time? We cannot completely answer this question which, from a game-theoretic perspective, is complicated. Note that the sequential service constraint inherent in a multi-lender debt structure is expected to invite defection from a pool agreement. Based on our discussion, we can offer two reinforcing intuitive arguments. These explanations are based on two characteristics of the lending market for medium-sized firms. First, given the limited number of banks typically servicing companies of the size included in our database (annual sales between EUR 25m and 250m), a standard reputation mechanism might possibly be effective. That is, creditor pools that are initiated and liquidated as time moves on, are a regular business activity. With respect to their members, these pools consist of permutations of a relatively small number of banks. Defection by one bank might then prove to be costly due to its possible involvement in other similar pools in the future. Second, for medium-sized firms we find the overwhelming portion of collateral to be inside rather than outside collateral. By definition, its marking-to-market (or liquidation) value is highly correlated with the company value. As pointed out earlier, inside collateral is like a call option on borrower assets. It is in the money whenever firm value θ, gross of debt repayments, is positive ($\theta > 0$). Given the option value of inside collateral, lenders will individually profit from coordination. It precludes untimely loan termination, thereby allowing efficient workout investments, which maximize the present value of total debt repayment. Furthermore, the collateralized fraction of loans, which does not form part of the creditor pool, will also appreciate in value as the creditor pool supports the reorganization of the firm.

There are 124 borrowers in the dataset who were distressed or potentially distressed for at least some interval of our 5-7 years observation window.

There are 58 credit relationships involving pool arrangements. However, bank behavior differs with regard to individual bank's participation in creditor pools. Table 5 indicates that for 4 out of 6 banks (namley those numbered 1, 2, 4, 6) participation in creditor pools can be observed in about 50% of all cases. Note that bank 3 has considerably more pool relationships, and bank 5 has considerably less. Thus, in the empirical model it will be necessary to control for the identity of the bank.

		Bank						
		1	2	3	4	5	6	total
Pool	0	8	16	2	8	22	10	66
	1	8	14	12	8	6	10	58
	total	16	30	14	16	28	20	124

Table 5: Cross-table of creditor pools and bank identity

The number of housebanks observed in our sample which are also member banks of creditor pools is less than proportional. Of the 58 creditor pools we observe, only 15 housebanks were involved. However, care must be exercised when interpreting this fact. There are 6 cases in our sample where the housebank is the one and only lending institution, making a creditor pool redundant. Furthermore, even if the bank we observe is not a housebank but engaged in a creditor pool, another member bank might be a housebank for the borrower in question.

The number of banks involved in a pool contract is a potentially relevant piece of information. In the literature, it is frequently argued that the higher the number of creditors, the more difficult it will be to achieve coordination. We do not have complete information about the structure of the creditor pool, with respect to its size and the identity of the member banks. However, we do know the total number of lending relationships. This number will be used as a proxy for the number of pool banks. Recall that the purpose of pool negotiations is to integrate all banks with active lending relationships.

Figure 1 relates the incidence of creditor pools to the number of bank relationships. It shows that the probability of pool formation is highest when the number of bank relationships is between four and seven. This is

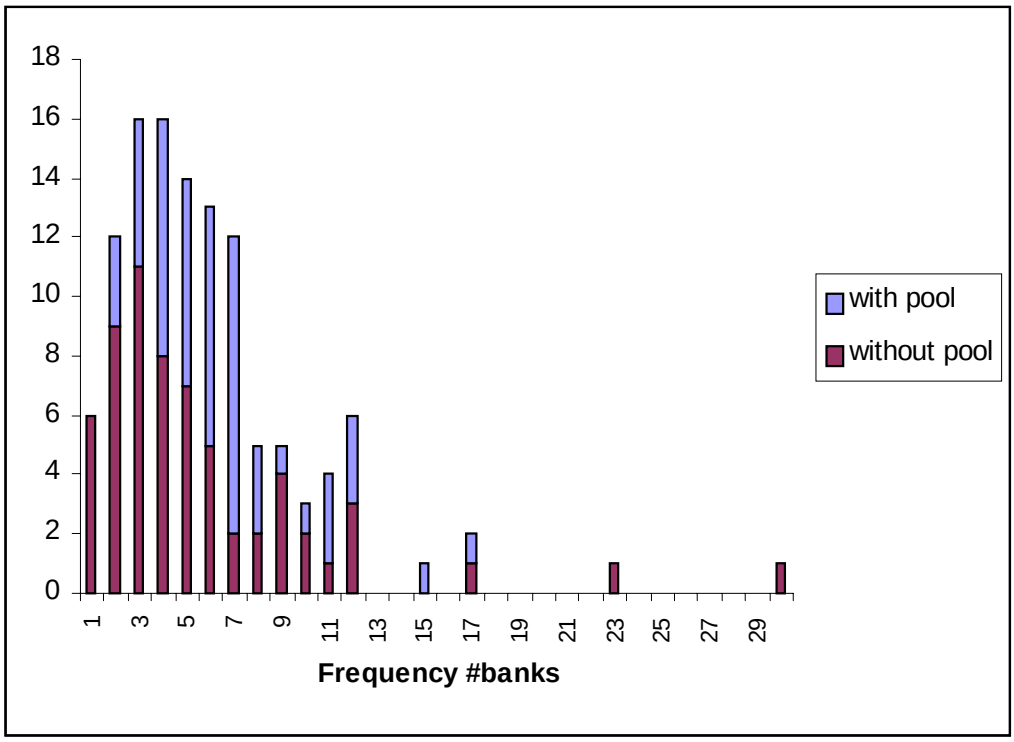

Figure 1: The frequencies of pool and non-pool cases as a function of the number of bank relationships (n=117)

consistent with the view that coordination problems are increasing in the number of creditors, thereby increasing the value of these pools. However, pools may be more difficult to establish when the number of creditors is large.

4 Hypotheses on private debt restructurings

4.1 Determinants of workout success

4.1.1 Creditor pools

When a borrowing firm faces insufficient funds to meet all its current payment obligations and is unable to raise new funds it will try to renegotiate the loans. A bank observing the borrower's illiquidity has to develop an opinion as to whether or not the firm is still solvent and creditworthy. Accordingly,

the bank will prolong the loan, or terminate it. Given that a sufficiently large number of banks terminate their loans at short notice, the borrower may be forced into bankruptcy, even if he is solvent. Thus, creditors have to think strategically about other creditors' expected behavior. If the bank believes that other banks will not roll over their loans, it may be optimal to terminate the outstanding loans right away. Probably the worst thing that could happen to the bank is that it rolls over its loans when all other creditors do not. Therefore, expectations can be self-fulfilling. Even if a solvent borrower's credit quality is common knowledge, expectations about premature foreclosure can make termination an optimal strategy. There may be cases in which a single lending bank would roll over its loans, while multiple lenders would force an inefficient liquidation of the borrower. This situation epitomizes the basic coordination problem inherent in standard debt contracts. In keeping with the models of Obstfeld [1996] or Morris and Shin [1999], we can define three sets of borrower fundamentals θ describing the borrower's creditworthiness. If $\theta \geq \theta_H$, the borrower has sound fundamentals making it easy for him to find new creditors when he faces a liquidity shortage. Even if all current creditors terminate their loans, his prospects are substantive and the optimal strategy is to roll over. If $\theta \leq \theta_L$, the borrower is illiquid and insolvent and will go bankrupt even if all his loans are rolled over. Thus, the best strategy in this situation is to terminate the loan no matter what other creditors do. The remaining interval $\theta \in (\theta_L, \theta_H)$ is critical. Whether or not to terminate the loan depends on the lender's expectation as to what fraction of total loans are terminated by other lenders. For each θ in the critical region there is a threshold fraction of loans, positively related to θ that will impose bankruptcy on the borrower if it is terminated. It is optimal to roll over the loan if a bank's expectation of the fraction of loans terminated is lower than the threshold fraction necessary to induce bankruptcy, and it is optimal to terminate otherwise. Thus, the coordination problem is a problem of multiple equilibria which can occur in the interval (θ_L, θ_H) depending on the expectations of creditors.

Since the coordination problem can lead to inefficient outcomes, it is necessary to think about ways to overcome the problem. Morris and Shin [1999]

show that transparency requirements relating to borrower quality (e.g. strict accounting standards) do not solve the problem, since coordination failure arises because of uncertainty about what other creditors will do, rather than because of uncertainty about fundamentals. Of course, one possible way to solve this problem is single-source lending. However, in single-source lending relationships, the creditor tends to have some bargaining power, causing a hold-up problem for the borrower. Thus, if the information generated about borrower quality remains proprietory, the relationship lender acquires an informational monopoly which can be exploited by pricing above the competitive level [see Rajan 1992].

An alternative to a lender monopoly is a situation that differentiates between normal times and distress periods. There are several competing lenders in normal times, and there is lender coordination in distress periods. Switching to lender coordination when distress is imminent is potentially valuable, because with coordination among all lenders, there is no incentive to run. Thus, inefficient liquidation becomes less likely. By the same token, efficient investment in workout activities becomes easier, since all lenders share any incremental financial commitment.

4.1.2 Number of bank relationships

Due to free-rider problems, the probability of successful renegotiation of debt in a distress situation is expected to be negatively related to the number of lenders [Hege 1997]. This is caused by the low probability of a single lender being pivotal for borrower's liquidation. We thus hypothesize that a larger number of bank relationships decreases the probability of workout success.

Given a creditor pool is formed, the number of extant bank relationships reflects the size of the pool. However, there are conflicting bargaining incentives among the different financiers of a distressed firm. Our a-priori belief is that bargaining costs are directly proportional to the number of banks in a pool. The main reason for this belief lies in the incentive of small creditors to deny concessions, or in general to be less actively involved in a restructuring process and, therefore, to be less committed to timely action. In compari-

son to pools with a small number of members, "large" pools are expected to need more time for decision-making. Stretching a workout over time may be costly in terms of opportunity costs as well as in terms of options foregone. Furthermore, since "large" pools are less prepared to make concessions and to act flexibly, they are likely to liquidate distressed firms more often than "small" pools. In this regard, "large" pools bear some similarity to a group of bondholders.

4.1.3 Housebank status

While we have a clear prediction for the effect of a creditor pool on workout success, we have no such hypothesis for the housebank relationship. There are counteracting effects to consider. On the one hand, a better informed housebank may be able to implement the timing and the sequencing of the workout decisions more efficiently. By the same token, it is more likely to get the menu of actions right, given its intimate knowledge of the borrower's history. On the other hand, once distress has become public, every lender will collect more information about the borrower in order to prepare a possible workout. In particular, if a creditor pool has been formed, the informational advantage of the housebank is shared by the pool, or at least the pool leader. For all these reasons the unique position hold by a housebank in normal times is likely to be weakened in distress periods. We therefore do not expect the housebank variable to have considerable explanatory power with respect to workout success.

4.2 Determinants of pool formation

The economics underlying the formation of a creditor pool merit a closer look. We will therefore try to understand what factors contribute to the likelihood of a pool being established. In our data set, coordination between lenders is a possibility whenever there are multi-bank relationships. The average number of bank relationships in our sample is 6, with values ranging from 1 to 30. In 6 out of 124 cases borrowers have single-bank relationships. As can be seen from the descriptive statistics in Table 5, we observe the emergence of

a pool in 58 cases (out of 118 multi-bank relationships).

4.2.1 Number of bank relationships

Although the existence of a creditor pool is value-enhancing, there is nevertheless a free-rider problem as long as the pool has not been agreed upon. The likelihood of a creditor pool being successfully formed will depend on the prior beliefs of all lenders with respect to the possible value enhancement. We therefore expect the number of lenders to play a role, where a larger number of lenders is associated with more free riding and thus with fewer pools.

4.2.2 Distribution of lending shares among lenders

In a similar vein, if the relative size of the financial commitments is about the same for all lenders, i.e. lending is uniform, we expect the formation of the pool to be more likely. In contrast, if one lender has provided the bulk of all loans, i.e. the distribution of lending shares is skewed, then free riding by the remaining banks is severe, and pool formation becomes less likely [see also Longhofer and Peters 1997].

4.2.3 Ratio of bank debt to total debt

The strength of the banks as a group among all lenders of the firm can be measured by the ratio of bank debt to total debt. For a small such ratio, pool formation among bank lenders will only mildly reduce uncertainty about lender behavior. In contrast, for a large bank debt to total debt ratio, expected benefits from pool formation are high. This may explain why the pool is extended to non-banks members, in particular to trade creditors.

4.2.4 Borrower size

Given that a creditor pool involves coordination costs, the banks' decision on pool formation also depends on the size of the borrower in terms of total assets. Total assets should have an impact on expected future revenues out

of which banks' costs will have to be reimbursed. We therefore hypothesize that borrower's size is positively related to the probability of pool formation.

4.2.5 Housebank and collateralization

In line with the argument regarding the housebank's role in determining workout success, the housebank is not likely to be a driving force in forming a creditor pool. Given its senior position in terms of collateral, as was shown by Elsas and Krahnen [2000], and given its superior information status, the housebank stands to lose less from an inefficient liquidation of company assets due to coordination failure than the other banks. Note that housebank status and the degree of collateralization are mutually reinforcing factors in this regard. Both variables will be included in the regression.

4.2.6 Severity of the distress shock

Pool formation may also be facilitated by the severity, from the relationship lenders viewpoint, of the distress shock. Thus, if the rating defining the onset of the distress period (i.e. the first negative rating for a given borrower during our observation window) is a 6 rather than a 5, the formation of a pool should be easier. The reason for this is that it should be easier for any given lender to convince all remaining banks of the necessity to form a pool if the economic situation as described by the rating has markedly worsened. In a univariate sense, the initial distress rating (i.e. 5 or 6) is expected to be related to the probability of pool formation. Table 6 demonstrates that in the case of an initial distress rating of 5, about 40 % of all cases rely on pool formation. If the inital rating is 6, however, the probability of pool formation rises to 70%, i.e. is more than 1.5 times as high.

		Event rating		
		5	6	total
Pool	0	59	7	66
	1	42	16	58
	total	101	23	124

Table 6: Cross-table of creditor pool and event rating

4.2.7 Bank identity

Finally, there may well be systematic differences between the banks in our sample with respect to their willingness to engage in pool formation. Recall that the banks in our sample comprise the biggest banks from all three German banking sectors, namely private banks, savings banks (mostly owned by communities), and cooperative banks. Thus, policy differences between institutions may well play a role here.

5 Results and discussion

We will first discuss the results of testing our hypotheses on workout success, and will then turn to pool formation. To determine the success of a workout, we include all relationships in the sample for which at least one period after the rating downgrade is observed. There are 23 cases for which the initial distress rating occurs in the last period of the observation window. Due to missing observations for certain variables used in the regression, our final sample consists of 94 relationships. Our dependent variable shall differentiate between successful and non-successful workouts.

One way to operationalize workout success relies on bank-internal corporate ratings. As explained earlier, these ratings are expected to represent an unbiased estimate of borrower default probability. The estimates emerge from the information acquired by the bank through the relationship with her borrowers. We define a workout to be successful whenever, at the end of our observation window, the rating following a workout investment has improved beyond the distress category. On our calibrated 1 to 6 rating scale (best to worst), the notches 5 and 6 are reserved for distress, or junk cases, while the notches 1-4 are categorized as investment grade. Thus, success describes a re-emergence of the distressed borrower as a healthy firm. The dependent variable will be labeled SUCCESS, and is defined as the achievement of an investment grade rating of 4 or above during the period of our observation window. SUCCESS is a dummy equal to one, if rating 4 or better has been achieved subsequent to the initial distress rating 5 or 6. The dummy equals

zero otherwise. Note, a value of zero does not necessarily imply that the workout failed. It may simply reflect the fact that the case has not yet been resolved at the end of our observation window. Thus, the dependent variable does not differentiate between "failure" and "not yet resolved". The number of unresolved cases is 50 (compared to 30 successful firms and 14 winding-ups) and could be reduced only by extending the length of the observation window.

5.1 Determinants of workout success

Explanatory variables are a POOL-dummy (equal to one if the relationship is embedded in a creditor pool), a housebank-dummy HB (equal to one if the bank we observe is the housebank), a variable #banks measuring the number of bank relationships of the client at the time of the distress event, and two interaction dummies, POOL×HB and POOL×#BANKS, where the latter variable serves as a proxy of poolsize. Since distress can start at any time within our window, we expect the success of a workout activity to display some time dependency. The economic consequences of workout activities will not be visible instantaneously, but probably need some time to unfold. Thus, the variable TIME2END captures the time remaining from the onset of distress until the end of our observation window. The reference group is 4 or more years. Table 7 shows the results of the probit analysis.

$$Success = f\left(\begin{array}{l} Pool,\ \#Banks,\ HB,\ Pool \times \#Banks, \\ Pool \times HB,\ Time2end \end{array}\right) \qquad (1)$$

Our basic regression (i) has a McFadden R^2 of 0.27, giving general support to the model in equation (1). To check robustness we ran several variants of model (1) that included firm size measured by total assets, debt structure, and earnings taken from the year preceeding the distress event, and industry dummies as additional explanatory variables (ii, iii). These controls were never significantly different from zero except for the equity ratio. The coefficient of the EQ-RATIO is positive and weakly significant at the 10% level. The results in Table 7 give a clear indication of the relevance

Variable	(i)	(ii)	(iii)
CONSTANT	-.271 (.507)	2.435 (2.343)	-2.393 (2.370)
POOL	3.276 (1.207)***	3.287 (1.261)***	3.290 (1.284)**
#BANKS	.038 (.059)	.023 (.066)	.023 (.071)
HB	-.362 (.402)	-.518 (.453)	-.373 (.488)
POOL×#BANKS	-.812 (.250)***	-.832 (.265)***	-.805 (.263)***
POOL×HB	.810 (.767)	1.213 (.821)	.813 (.883)
LOG(ASSETS)	-	-.252 (.203)	-.287 (.207)
EQ-RATIO	-	1.928 (.994)*	1.814 (1.017)*
ROA	-	.376 (1.290)	.830 (1.326)
ENGINEERING	-	-	.552 (.431)
MANUFACTURING	-	-	.735 (.455)
TIME2END1_2	-.207 (.381)	-.326 (.432)	-.196 (.443)
TIME2END3	.192 (.410)	.171 (.448)	.182 (.452)
obs	90	87	87
Mc Fadden R^2	.27	.31	.34

Table 7: Binary probit analysis of workout success

of the pool for the success of a workout. The direct pool effect is positive and different from zero at the 1% level of significance (5% level in variant (iii)). The housebank dummy (HB) has insignificant coefficients, as does its interaction term with the POOL-variable. Thus, the relationship intensity, as captured by the housebank variable, does not translate into a more successful workout management. This observation is interesting in itself because it shows that the presumed informational advantage of the housebank does not automatically imply a special competency in restructuring the client. In fact, a result to the contrary would have been puzzling, since once a workout is initiated, the informational differences between housebanks and other restructuring banks become blurred. In Table 8 we also find the number of bank relationships (#BANKS) to have a positive, albeit not significant effect on workout success. Its interaction with the pool-dummy (POOL×#BANKS) turns out to be negative at the 1% level of significance. The interpretation of this finding uses the theoretical arguments presented before, namely the common resource property of a distress situation with many lenders. Due to the difficulty of organizing a pool, and of maintaining its internal stability,

the positive effect of pool formation on the success probability of workouts is weakened by the number of lenders. Recall that our #BANKS-variable measures the total number of currently active lending relationships as reported in the banks' credit files. Thus, we cannot account for the size of the pool per se. From conversations with bankers we know, however, that under normal circumstances a creditor pool comprises all relevant financial institutions. Assuming that by and large all banks are also pool members, the negative coefficient of POOL×NO.BANKS reflects the difficulties of running a pool efficiently when the number of pool members increases. Both TIME2END-variables are not significantly different from zero.

5.2 Pool formation

The results so far direct attention to the institution of the creditor pool. The following regression will help us to understand the determinants of pool formation. We excluded lending relationships with only a single bank from the sample because with only one bank no pool needs to be formed in order to harmonize incentives. There were several missing values for total bank debt. The final subsample consists of 83 observations. The dependent variable is the POOL-dummy variable, equal to one if a creditor pool has been formed and zero otherwise. The explanatory variables comprise the number of banks #BANKS as potential pool members. The SKEWNESS-variable proxies for relative size of lender claims.

$$skewness = \left| \frac{bank's\ \ debt}{total\ \ bank\ \ debt} - \frac{1}{\#banks} \right|$$

SKEWNESS is small when the bank's lending share roughly equals one divided by #BANKS, and it increases if the bank lends more or less than this. The variable COLLATERAL measures the percentage of a bank's loans with a particular client that are collateralized. RATING6 measures the severity of the initial distress shock comprising all observations with a markedly negative rating (rating 6 on the 1 to 6 scale) as the initial distress rating. The variable LOG(ASSETS) measures the size of the borrower. The share of bank debt in total debt is described by the variable BANK/TOTALDEBT. The identity of each of the six banks is included in the variables BANK1, BANK3, ...,

BANK6 (Bank 2 serves as the reference group). And, finally, we include the housebank dummy (HB) in our regression. The results of the probit analysis are shown in Table 8.

$$Pool = f\left(\begin{array}{l} HB,\ Collateral,\ Rating6,\ \#Banks,\ LogAssets, \\ Skewness,\ \frac{Bankdebt}{Totaldebt},\ Bank_{1...6},\ Industry,\ Time2end \end{array}\right) \qquad (2)$$

Variable	(i)	(ii)	(iii)	(iv)
CONSTANT	-2.687 (2.117)	-2.447 (2.310)	-2.670 (2.157)	-2.433 (2.348)
HB	.283 (.337)	-.884 (.405)	.372 (.353)	-.084 (.435)
COLLATERAL	-.552 (.522)	-.581 (.612)	-.692 (.542)	-.756 (.639)
RATING6	.944 (.470)**	1.216 (.564)**	1.049 (.484)**	1.430 (.610)**
#BANKS	.096 (.057)*	.153 (.076)**	.104 (.059)*	.157 (.079)**
LOG(ASSETS)	.233 (.182)	.303 (.210)	.215 (.187)	.289 (.215)
SKEWNESS	-1.835 (.847)**	-2.931 (1.174)**	-2.001 (.917)**	-3.181 (1.264)**
BANK/TOTALDEBT	-.346 (.299)	-.606 (.426)	-.345 (.259)	-.593 (.369)
BANK1	-	-1.018 (.692)	-	-1.218 (.751)
BANK3	-	.225 (.813)	-	-.021 (.850)
BANK4	-	-.871 (.558)	-	-1.160 (.637)*
BANK5	-	-2.113 (.663)***	-	-2.303 (.719)***
BANK6	-	-.514 (.651)	-	-.608 (.680)
ENGINEERING	-	-	.078 (.404)	.458 (.534)
MANUF	-	-	.590 (.399)	.755 (.476)
TIME2END1_2	.301 (.359)	.275 (.460)	.341 (.378)	.429 (.490)
TIME2END3	.423 (.409)	.681 (.457)	.379 (.413)	.668 (.463)
obs	83	83	83	83
Mc Fadden R^2	.18	.34	.20	.36

Table 8: Binary probit analysis of pool formation

The results reported in Table 8 give a first indication concerning the determinants of pool formation. The RATING6-variable can be identified as a strong contributor in terms of significance. The coefficient of RATING6 is positive and significant at the 5% level indicating that a large shock to the creditworthiness of the borrower as expressed by the rating deterioration makes the formation of a pool more likely. A possible explanation for the dependence of pool formation on the rating class is that different lenders may have divergent opinions on the severity of the borrower's loss of quality. To

form a pool, eventually all the banks will have to agree that the prospects of the borrower are such that unified action is warranted. This common expectation is more likely to develop if borrower quality is at the lowest rating notch. The variable LOG(ASSETS) measures the size of the borrower, its coefficient is not significantly different from zero. The coefficient of the COLLATERAL-variable is negative as hypothesized albeit not significant. The housebank variable (HB) turns out to be insignificant, too. This is remarkable as it suggests that housebanks are not the driving force behind pool formation, at least in our sample. However, it is likely that, although we do not observe the housebank, there may be a housebank among the borrower's alternative bank relationships.

We now turn to an analysis of the importance of potential pool size with respect to the number of bank creditors. The significance of the POOL×#BANKS -interaction term in the probit on workout success is striking. The coefficient of #BANKS in the pool regression is positive, significant at the 10% and 5% level, respectively. This result tells us that it is more likely that a creditor pool is formed when the number of creditors increases. In this respect, our hypothesis is not supported. Besides the number of potential pool banks, their relative financing shares also determine the probability of pool formation. We find the coefficient of the SKEWNESS-variable to be negative and significant at the 5% level, implying low SKEWNESS values (signifying similar financing shares among the lenders) to be associated with a high probability of pool formation. Of course, SKEWNESS only proxies for the distribution of shares among banks. It assumes that all remaining banks lending to a particular borrower, besides the one for which we know the data precisely, will have equal financing shares. A closer look at the relationship between the number of bank relationships and the SKEWNESS-variable reveals that large pools tend to have a dominant creditor, with one bank providing the bulk of all outstanding debt. Figures 2 and 3 distinguish between the pool and the no-pool subsample. We find lower SKEWNESS, on average, in the pool subsample compared to the no-pool subsample. This suggests that pool formation is easier if lenders hold more homogenous claims. Also, the SKEWNESS-variable tends to be positively correlated with #BANKS in the

pool subsample, while in the no-pool subsample these variables are uncorrelated. This might help to explain why the interaction term POOL×#BANKS in Model (1) is negative: large pools tend to be skewed w.r.t. financing share, creating free-rider incentives.

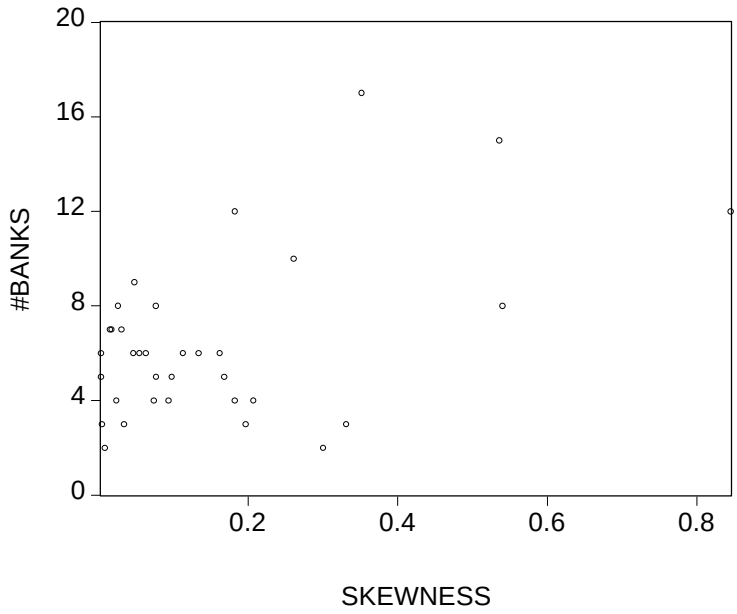

Figure 2: Skewness vs. number of banks (pool subsample)

We also tested different specifications (ii, iii, iv) of the model including dummies controlling for bank identity and industry, and the fraction of bank debt in total debt. The coefficient of BANK5 is seen to be significant at the 1% level across all specifications, supporting the view that banks have institution-specific policies with respect to their willingness to engage in creditor pools.

5.3 Robustness

5.3.1 Endogeneity

Since the pool variable is endogenous, we cannot rule out the possibility that it may be correlated with the error term in model (1). In this case the coefficients in our success-estimation would be inconsistent. A way to estimate model (1) constistently is suggested by Maddala [1983]. Our model is similar

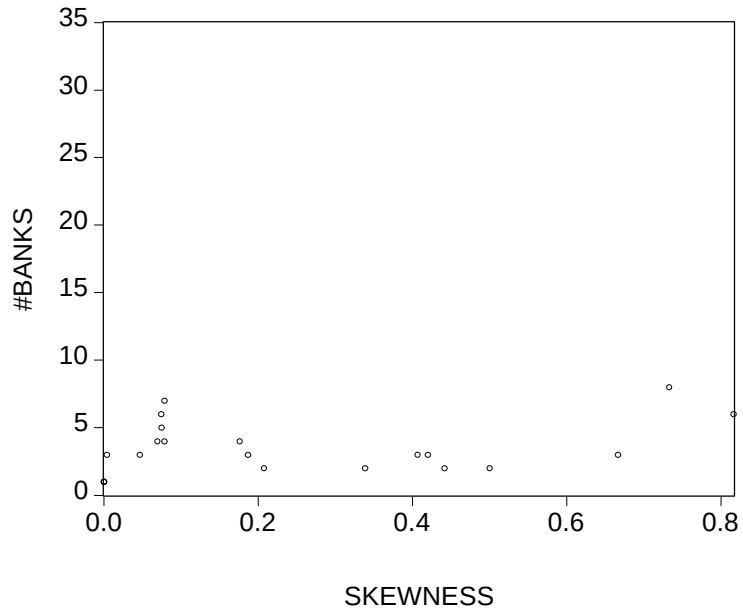

Figure 3: Skewness vs. number of banks (no-pool subsample)

to the following system of equations where y_1^* describes the probability of pool formation which is observed as a dummy y_1. The variable y_2^* describes the probability of workout success, observed as a dummy y_2 as well.

$$y_1^* = \gamma_1' x_1 + \varepsilon_1 \qquad (3)$$

$$y_2^* = \beta_2' y_1 + \gamma_2' x_2 + \varepsilon_2 \qquad (4)$$

There will be two stages of estimation. We take the probit on pool formation (iv) in the previous chapter as the first stage regression (equation (3)). We then replace y_1 in equation (4) by $\Phi(\gamma_1' x_1)$ from the first stage regression (called $\widehat{\text{POOL}}$), and then estimate equation (4) as a probit. The results of the second stage are documented in Table 9.

It is apparent from Table 9 that the results reported earlier are robust with respect to a possible endogeneity problem. We therefore conclude that workout success is a positive function of the existence of a creditor pool and a negative function of the size of the pool.

Variable	Coeff
CONSTANT	-1.022 (.694)
$\widehat{\text{POOL}}$	3.254 (1.358)**
#BANKS	.142 (.086)*
HB	.056 (.574)
$\widehat{\text{POOL}}$×#BANKS	-.651 (.214)***
$\widehat{\text{POOL}}$×HB	-.502 (1.107)
DURATION1-2	-.220 (.377)
DURATION3	.436 (.396)
obs	83
Mc Fadden R^2	.17

Table 9: Two-stage regression of workout success (second-stage results)

5.3.2 Duration analysis

In determining the probability of workout success, we have used two TIME2END-dummy variables controlling for effects of the length of the observation window succeeding the distress event. The underlying hypothesis states that the probability of workout success positively depends on the time span observed. However, these dummies do not turn out to be significant.

In addition, we employed a duration model analyzing workout time on a monthly basis. It specifies the probability of workout success conditional on the time spent in distress. We include the explanatory variables of equation (1) as covariates and assume a Weibull distribution. The estimation results support the findings of the probit estimation presented above. The coefficients of both variables, POOL and POOL×#BANKS, have the expected signs and are significantly different from zero.

6 Conclusion

While the distress of corporate borrowers has always been an important topic in financial economics [e.g. see Gilson, John, and Lang 1990], the more specific question of lender coordination around distress events has not yet received much attention. However, we are convinced that the question of whether or not lenders are able to coordinate themselves around the onset

of a corporate distress is a critical element in a competitve, market-based financial system. Without the expectation of a possible future coordination among lenders, there will be less willingness by financial institutions to lend to their corporate clients. Models by Obstfeld [1996] and Morris and Shin [1998, 1999], among others, stress the costs of failure to coordinate among lenders.

In this paper, we attempt to explore empirically the hypothesis underlying the above argument. We make use of a unique data set which contains detailed first-hand credit-file information on bank behavior in corporate distress and on corporate performance thereafter. Our major finding relates to the role of creditor pools in corporate financial distress. A probit regression of workout success on a number of independent variables has revealed that the existence of a creditor pool is the driving explanatory factor in our data. The probability of a workout being successful increases when there is a creditor pool. However, this effect is weakened if the number of bank relationships and thus the size of the pool increases. The present study has also added to our understanding of relationship lending.

The major contribution of our study to the literature concerns the identification of creditor pools as viable and relevant contractual arrangements. To the best of our knowledge they have not been dealt with in the economic literature before. Creditor pools are agreements between several institutional lenders to combine their respective claims and to coordinate their future activities vis-à-vis the borrower. In Germany, forming a creditor pool is common business practice among banks, and it is sometimes enlarged to include the suppliers, or trade creditors, as well. We have shown that creditor pools have real consequences in the sense of increasing expected workout success. In measuring success, we relied on the individual internal rating systems used by the banks in our sample.

What makes the creditor pool valuable? In our opinion, the creditor pool is the proper institution for achieving creditor coordination when a run by the lenders on a firm's assets is imminent. As has been pointed out in the recent theoretical literature, run-type situations may cause damage to the firm, and welfare loss to society because of the illiquidity of firm's assets.

Especially in a distress situation, firm assets will be difficult to sell, since overall industry prospects are likely to be unfavorable anyway. In addition, potential outside investors will be aware of the adverse selection risk they are running, and will thus demand a significant discount [see Morris and Shin 1999].

The formation of a creditor pool is therefore an important decision, requiring an initial attempt to coordinate the interests of several lenders. In particular, lenders have to be convinced that they will benefit individually from not terminating the relationship with the borrower right away. We have modeled the decision to form a creditor pool as a function of the number of individual lenders that exist before the pool is being formed,the distribution of lending shares among banks, the banks' share in firm's total debt, the shock to creditworthiness hitting the firm, the size of the firm, and the relationship status of the bank (housebank or normal bank) as well as its collateralization. Furthermore, we included dummies for bank identity and industry in several variants of the regression. The results show that creditor pools are more likely to be formed when the number of banks is large and firm quality is hit by a large shock, according to initial distress rating. Furthermore, the distribution of financing shares among banks has a significant impact on the probability of pool formation. The SKEWNESS-variable captures the bargaining problems that emerge when lenders of different relative commitment try to reach a mutual agreement. Finally, the housebank is not a driving force behind pool formation. This stands in contrast to earlier findings relating to the special role that housebanks play in normal times, i.e. in non-distress periods.

Several open issues emerge from this study. First, we do not have any information about the dynamics of pool formation. In particular, we do not know what exactly triggers the initiation of the pool, and its stability over time. This is a potentially important issue, since creditor pools are a real-world example of a workable solution to the common resource public goods problem. Understanding its strengths and its weaknesses in a free contracting environment may shed light on the construction of workable regulatory solutions in other areas of application. Linked to this first issue is a second

one, namely the question of whether creditor pools also exist in other European countries, and the US, and how they operate. In particular, and this is the third issue, it would be interesting to discover the extent to which the viability of creditor pools in different countries is a function of the specific regulations of their respective insolvency codes.

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