

# Bargaining Power and Information in Loan Contracting

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## Abstract

This paper analyzes the relation between borrower bargaining power and the type of information (hard and soft) available to the bank. We define ex post measures of relative borrower bargaining power based on the variation of loan terms within rating grades and study how these measures relate to hard and soft information. Using loan data on small and mid-sized firms from the U.S. and Germany, we find that information on soft facts is significantly positively related to borrower bargaining power. In addition, a more favorable assessment of soft facts relative to hard facts is associated with higher borrower bargaining power. Borrower bargaining power also persists over time which is consistent with the lower intertemporal variability of soft information and incompatible with a random allocation. Finally, we rule out that the results are driven by ratings manipulation or statistical limitations of the rating systems. Numerous tests of robustness confirm the previous findings. Our study suggests that soft information represents an important determinant of borrower bargaining power, affecting the ultimate outcomes in loan contracting.

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## 1. Introduction

The financing terms of firms represent an interesting area to study effects arising from bargaining power and information. This is particularly intriguing in the context of small and mid-sized firms, which have been characterized as relatively opaque, bank-dependent, and risky in the literature (e.g., Petersen and Rajan, 1994). Consequently, bank-borrower relationships in small business finance are particularly suited to study the determinants of borrower-specific bargaining power. Main categories of determinants are borrower characteristics (demand side), bank characteristics (supply side), bank-borrower relationship characteristics (previous interaction), and macro-economic as well as market factors (competition, business cycle).

In this paper we focus on the relation between the *type of information* available to the bank and *borrower bargaining power*. The first best solution in drawing conclusions about bargaining effects would be to compare ex ante preferences of borrowers and banks on loan terms with actual contractual outcomes. Unfortunately, this straightforward approach cannot be adopted due to the lack of reliable data. Therefore, we propose a second best solution on how to identify borrower bargaining power. Specifically, we start at the end of the loan contracting process and exploit the variation of the contractual outcomes for borrowers with the same risk of default. If single loan terms for borrowers are more favorable than those of risky borrowers (controlling for borrower, bank, other loan terms, and macro-economic effects), bargaining power might be one plausible explanation. Based on this reasoning we define three measures of borrower-specific bargaining power that can be characterized as *ex post*, *relative* and *risk-adjusted*. Our most preferred measure is based on the loan contract term that is usually fixed last (e.g., Bharath, Dahiya, Saunders and Srinivasan, 2008; Kirschenmann and Norden, 2008; Standard and Poor's, 2006), the loan spread, and indicates a relatively high bargaining power for an individual borrower if the contracted loan spread lies below the median loan spread of same-rated borrowers. Such a favorable outcome of the

bilateral bargaining might represent a net benefit for the borrower and a net cost for the bank. We also define a second measure based on collateral and on a combination of loan spread and collateral to consider the potential endogeneity in lending terms, in particular the issue whether loan spreads and collateral are complements or substitutes.

Thus far, there is no evidence whether bargaining power is affected by information on hard facts, soft facts or both. This question is highly relevant since the literatures on small business finance and banking have emphasized the importance of soft information production (e.g., Boot, 2000; Berger and Udell, 2002; Petersen, 2004). The issue also has important implications for firms borrowing from banks and the risk management (including incentive problems) inside banks (e.g., Udell, 1989; Stein, 2002; Scott, 2004; Hertzberg, Liberti and Paravasini, 2008; Liberti and Mian, 2009). Hard facts in bank lending refer typically to financial statement and payment information while soft facts include the strategy, management skills and product-market position of the borrowers. Hard information can be relatively easily gathered, stored, evaluated and transmitted to third parties while soft information is difficult to handle. Moreover, the notion soft information is not well-defined in the literature. In this paper, non-financial factors information, in particular the assessment of management skills, are considered as soft information (e.g., Petersen, 2004; Grunert, Norden and Weber, 2005).

The empirical analysis of two micro-data sets on loans to small and mid-sized firms from the U.S. (SSBF 2003; 1,761 loans) and Germany (detailed credit file data from six banks; 1,062 loans) yields the following results. First, we find that information on soft facts is significantly positively related to borrower bargaining power. Second, a more favorable assessment of soft facts relative to hard facts is associated with higher borrower bargaining power. Both findings together suggest that there are *second order effects* from soft information, i.e. the latter does not only matter for the credit rating level but also for within-rating grade variation of loan terms. Third, borrower bargaining power exhibits persistence

over time which can be explained by the lower intertemporal variability of soft information compared to hard information. Persistence also rules out that borrower bargaining power emerges randomly. Fourth, we fail to find evidence that these results are driven by ratings manipulation or statistical limitations of the rating systems.<sup>1</sup> Finally, numerous tests of robustness confirm the previous findings in both samples.

Our study contributes in several ways. This is the first empirical study that explicitly links bargaining effects and information production in small business finance, providing new evidence for the role of hard and soft information in bank-borrower relationships. Moreover, the robustness of the results both in the U.S. and Germany sample suggests that the link between bargaining power and soft information is not mitigated because of institutional differences between countries. Finally, from a methodological perspective we contribute by proposing robust indicators for borrower bargaining power.

The remainder of this paper is organized as follows. Section 2 reviews the related literature and establishes our main hypothesis. Section 3 describes the data and provides a definition of the bargaining power measures. Section 4 reports the main results as well as further empirical checks. Section 5 summarizes findings from numerous tests of robustness. Section 6 concludes.

## **2. Related literature and hypothesis**

This study deals with a topic that is at the intersection of three areas of the literature: determinants of lending terms, the role of hard and soft information in banking, and bargaining power in lending relationships.

First, we contribute to the empirical research on the determinants of lending terms, in particular on loan rates and collateral in small business lending (e.g., Petersen and Rajan,

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<sup>1</sup> One could argue that additional information may be revealed after the rating process. However, banks claim that they include all relevant information in the credit rating.

1994; Berger and Udell, 1995; Blackwell and Winters, 1997; Elsas and Krahn, 1998; Machauer and Weber, 1998; Berger et al., 2005; Agarwal and Hauswald, 2007; Cerqueiro, Degryse and Ongena, 2007). Cerqueiro, Degryse and Ongena interpret deviations of actual loan rates from predictions of a comprehensive loan pricing model as evidence for “rules and discretion” in the bank behavior. It turns out that “discretion” is more important in the case of small and unsecured loans, small, risky and opaque firms with relatively old owners, in weak bank-borrower relationships, and when bank competition is low. The key difference to our study is that Cerqueiro, Degryse and Ongena (2007) distinguish between situations of high (= discretion) and low variation (= rules) in loan rates whereas we investigate how soft information affects the likelihood of having above (= high bargaining power) or below average (= low or no bargaining power) loan terms within a rating grade, independent from the strength of the variation. In other words, they focus on the overall unexplained variation of lending terms whereas this study looks inside a rating grade and ranks borrowers according to their loan terms. Furthermore, in contrast to most of the literature, we do not focus on (beneficial or adverse) effects arising from the amount of information available to the bank (informational asymmetries). Instead, we analyze how bargaining power is affected by the *evaluation* of soft and hard information.

Second, we extend the literature that analyzes the type of information in banking, especially the importance of soft information (e.g., Burghof, 2000; Berger and Udell, 2002; Petersen, 2004; Grunert, Norden and Weber, 2005; Agarwal and Hauswald, 2007; Garcia-Appendini, 2007; Norden and Weber, 2008; Liberti and Mian, 2009). For example, Grunert, Norden and Weber (2005) provide evidence that soft information represents an important factor in assessing the default risk of borrowers in SME finance. They find that a combination of financial (hard facts: financial statement and payment information) and non-financial factors (soft facts: management skills, the firm’s product-market position and strategy) significantly improves the prediction accuracy of bank internal credit rating systems. These

results represent evidence for first order effects from soft information while this study uncovers also second order effects, i.e. soft information relates to the within-rating variation of loan terms.

Third, there are few studies that explicitly focus on bargaining power effects in bank-borrower relationships (e.g., Uchida, 2006; Rudolph, 2006; Wu and Wu, 2007; Kirschenmann and Norden, 2008).<sup>2</sup> Uchida (2006) investigates the empirical determinants of bargaining power in bank-borrower relationships in Japan, measured by the transaction costs a contracting partner has to bear. On the one hand, stronger bank competition and better borrower performance raises the bargaining power of borrowers. On the other hand, the influence of asymmetric information is rather weak. More specifically, a higher availability of hard information tends to decrease borrower bargaining power but neither the bank's private information nor auditing financial statements play a significant role. Moreover, the study fails to find an impact of soft information on bargaining power which is in sharp contrast to our results. Furthermore, combining insights from finance and marketing, Wu and Wu (2007) analyze the intertemporal profitability of bank-customer relationships based on loan data from a leading bank in Taiwan. They document that the pattern of intertemporal changes of the price premium depends on borrower bargaining power. One difference to our study is that the proxy for borrower bargaining power is based on a borrower's revenue brought to the bank. Moreover, bargaining power is considered as an independent variable while we use indicators for bargaining power as dependent variable. Most important, the study relates intertemporal loan pricing to asymmetric information and bargaining power but not the type of information available to the bank. Finally, Santos and Winton (2009) analyze bank characteristics and bargaining power for a sample of large, publicly-traded U.S. borrowers from 1987 to 2007.

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<sup>2</sup> There are studies that *indirectly* touch bargaining power in the context of the number and structure of bank relationships, borrower switching costs, bank competition, and mergers and acquisitions in the banking industry.

They detect a negative relationship between the bank's capital level and the contracted loan spread.

Based on the literature and the subsequent reasoning we establish the following main hypothesis<sup>3</sup>: *Soft information matters for borrower bargaining power more than hard information.* This hypothesis can be substantiated as follows. Hard information like financial statements or payment information fluctuate strongly over time and are in large part driven by the macroeconomic cycle. Favorable hard facts do not necessarily materialize into strong relative bargaining power because the majority of borrowers exhibit good (bad) financial ratios in good (bad) times, especially firms acting in the same industry. In contrast, soft information like management skills, product-market characteristics and firm strategy are more stable over time and predominantly driven by deeply rooted firm-specific factors.<sup>4</sup> Therefore, the evaluation of soft facts may represent an important determinant of borrower bargaining power. In addition, it is conceivable that borrowers who obtain a relatively good assessment of their soft facts are *per se* smarter in bargaining. Furthermore, a differential assessment of hard and soft facts might also affect borrower bargaining power. If the assessment of soft facts is better than that of hard facts relative borrower bargaining power should be higher than in the opposite case. In this context, we assume that the borrower has full knowledge about the relevant soft facts and employs this knowledge for bargaining in the loan contracting process with the bank.

### **3. The data and definitions**

#### *3.1. The data*

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<sup>3</sup> This hypothesis is also based on the fact that the bank first assigns a rating to a borrower and then negotiates the loan terms.

<sup>4</sup> We will provide more specific explanations on soft factors when we introduce the empirical proxy variables in Section 3.1.

We employ data from the largest and third-largest banking systems in the world (U.S. and Germany) to analyze how the type of information available to the bank (hard, soft) relates to borrower bargaining power.

This comparative analysis has several advantages. First, the U.S. and Germany differ in several institutional dimensions (market-based vs. bank-based financial system, lending infrastructure like legal and judicial system, creditor rights, bankruptcy laws, etc.; see Berger and Udell, 2006). Differential findings might result from the cross-country heterogeneity while similar findings would be evidence for a robust economic relationship (out-of-sample validation). Second, given the size of both economies we believe that our results are highly relevant and may have broader implications for bank financing of SMEs in other countries (e.g., for a recent survey see Beck, Demirgüç-Kunt and Martínez-Peria, 2008). Third, the data comes from different years and many banks. Fourth, although there is considerable heterogeneity between the countries, the borrowing firms in both samples are relatively similar with respect to size, default risk (total assets, sales and credit ratings) and lending terms (loan spreads, collateral).

The German data comes from a unique data set including detailed credit file information from 1,062 loans (240 borrowers), granted by six large German banks during the period 1992-1996 (e.g., Elsas and Krahn, 1998; Machauer and Weber, 1998; Grunert, Norden and Weber, 2005). The banks cover all three pillars in the German banking sector (four private commercial banks, one state-owned bank, and one cooperative central bank) and credit files were drawn randomly from each of the banks every year.<sup>5</sup> The panel structure allows analyzing the cross-sectional and time-series variation in bargaining power and information available to the banks. The latter consists of hard facts (FINRAT), soft facts (MGRAT) and an

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<sup>5</sup> Precisely, 40 credit files were collected from 6 banks in 5 years (leading to a maximum number of 1,200 observations from 240 borrowers, hereof 1,062 loans that are complete and ready for the analysis). In addition, the number of 40 borrowers from each bank decomposes into 25 borrowers that were randomly drawn from the overall borrower population and 15 from the sub-sample of firms in financial distress. This sampling technique leads to an overrepresentation of distressed firms in the entire sample. We address this issue in Section 5 and show that it does not affect our main results.

overall bank-internal credit rating (RAT). Hard facts refer mainly to financial statement information while soft facts refer to the assessment of the firm's strategy, product-market position, and management skills (competence, education, leadership, and credibility). The overall credit ratings represent a combination of hard and soft facts.

The U.S. data comes from the Survey of Small Business Finance 2003 and includes loans to 1,761 small firms (e.g., Mach and Wolken, 2006; Cerqueiro, Degryse, and Ongena, 2007; Park, 2008). The analysis of bargaining power and information is based on one loan from each firm (the "most recent loan"). Hard facts are measured by the Dun & Bradstreet credit score (CREDIT\_SCORE) as included in the SSBF 2003. Proxies for soft information, that are similar to MGRAT in the German Sample, are the education of the owner (EDU), his business experience/expertise (EXPER) and his age (AGE).<sup>6</sup> These variables are similar to the inputs of MGRAT in the German sample, they have been considered as most important proxies for soft information in the literature, and represent an integral part of the "C's of credit"<sup>7</sup> in the U.S. banking industry (e.g., National Association of Credit Management, 1965). Especially soft information is crucial for the assessment of the categories "character" and "capacity" (management ability). As bankers have pointed out "*there is no substitute for character – it is a vital factor*" (Collins, 1966). Furthermore, with regard to hard information we take the D&B credit score which is based on financial statements and payment information and which does not include the variables EDU, EXPER and AGE (e.g., Kallberg and Udell, 2003).

For both samples we show descriptive statistics for the type of information (hard, soft), various borrower characteristics, bank relationship characteristics, loans terms (spread,

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<sup>6</sup> We refrain from aggregating these raw variables to a credit score on soft information to avoid a "black box".

<sup>7</sup> The "C's of credit" represent a long-established practice in the U.S. banking industry to assess the creditworthiness of a borrower by examining the categories 1. character (integrity, honesty), 2. capacity (management ability), 3. capital, 4. collateral (which cannot substitute a weakness in character) and 5. conditions (business cycle, industry effects) (e.g., Collins, 1966). Character and capacity are considered as the most important categories.

collateral) and bank competition (only for the U.S.). Table 1 reports summary statistics for the German sample (Panel A) and the U.S. sample (Panel B) separately.

(Insert Table 1 here)

It can be seen that the mean rating for financials (hard facts, FINRAT) is 3.66 in the German sample and 3.03 (CREDIT\_SCORE) in the U.S. sample. Moreover, in the German sample the assessment of soft facts (MGRAT) shows a mean of 2.69 which is more favorable than the evaluation of hard facts. The median log sales for the German firms amount to 11.59 and to 14.65 for the U.S. firms. Unsurprisingly, similar relations are found for total assets (the correlation between total sales and assets is 0.78 in the German sample and 0.86 in the U.S. sample). Turning to bank relationships characteristics, we observe that the median of the log number of bank relationships (log duration) is 1.6 (5.3) in the German sample and 1.1 (4.2) in the U.S. sample. Median loan spreads are 3.63 percentage points in the German sample and 3.23 percentage points in the U.S. sample. The percentage of secured loans is 74% in the German sample (number not shown in Table 1; instead we report the ratio of collateral relative to the loan amount) and 55% in the U.S. sample. The distribution of the credit scores for U.S. firms is slightly more shifted to the better (left) end than the bank-internal credit ratings for German firms. The mode of both distributions is rating grade 3, the standard deviations are comparable (1.21 for Germany, 1.45 for the U.S.), and the overall shape of the distributions does not differ significantly.

Essentially, both samples are relatively similar and exhibit typical characteristics of SME lending in both countries.

### *3.2. Defining borrower bargaining power*

Dealing with borrower bargaining power in empirical research is inherently challenging because it is a classical example for a latent variable. The first best solution would be to compare *ex ante preferences* of both contracting parties (bank, borrower) with the actual *outcome* of the loan negotiation process. Borrower bargaining power would be present if the contracted loan terms are closer to the borrower's *ex ante preferences* than to the bank's initial offer. Unfortunately, there is no or no reliable data on *ex ante preferences* about lending terms available for research.

Therefore, we consider second best measures of borrower bargaining power. Specifically, we construct measures that

- (i) are based on observable, contracted loan terms (spread, collateral, a combination of both), i.e. the measures can be seen as *ex post* indicators of bargaining power
- (ii) measure *relative* effects (not absolute effects), i.e. is bargaining power for borrower i higher or lower than for borrower j?
- (iii) are *adjusted* for observable determinants of default risk, i.e. we do not address the relation between absolute borrower bargaining power and overall default risk.

We define three non-parametric *ex post* measures of relative borrower bargaining power that are based on the within-rating grade variation of loan terms (loan spreads, collateral, or both).<sup>8</sup> First, POWER1, our most preferred measure, equals one if the contracted loan spread of borrower i is below the median loan spread for same-rated borrowers, and zero otherwise.<sup>9</sup> The main argument here is that theoretically same-rated borrowers are expected to pay the same loan spread when borrowing from the same bank in the same year (controlling for maturity, collateral, etc.). Given that there is substantial variation within rating grades the

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<sup>8</sup> Kirschenmann and Norden (2008) use these measures of borrower bargaining power to analyze the relationship between borrower risk and loan maturity.

<sup>9</sup> Loan spreads are calculated as the difference between all-in loan rates minus same-currency and same-maturity risk-free rates. Hence, any additional deviation might be driven by bargaining power.

presence of bargaining power is not unlikely. Second, POWER2 equals one if the ratio of collateral relative to the loan amount for borrower  $i$  is below the median of this ratio for same-rated borrowers in the German sample (or unsecured in the U.S. sample), and zero otherwise. Third, we define the ordinal variable POWER3 as the sum of POWER1 and POWER2, considering bargaining on loan spreads and collateral simultaneously.

The underlying reasoning for these measures is the following. If borrowers manage to obtain loan terms that are more favorable (either lower loan spreads or less collateral or both) than those of similar borrowers (same risk of default, controlling for other loan terms like maturity and collateral) it is not unlikely that their bargaining power is relatively high in comparison to similar borrowers (with neutral or less favorable loan terms).<sup>10</sup> We do not claim that bargaining power (either high power of the borrower or low power of the bank or any combination) is the exclusive driver of the outcome in loan contracting. However, we think that it is reasonable to assume that the final outcome is positively correlated with the level of borrower bargaining power. Hence, the previously defined measures may serve as indicators of bargaining power. In addition, it is important to emphasize that POWER1, 2, 3 are risk-adjusted, i.e. the fraction of borrowers with high and low bargaining power is 50% : 50% in each credit rating grade. This implies that the measure is unrelated to the overall (absolute) borrower default risk by definition.<sup>11</sup>

There are several reasons why the loan spread represents a useful indicator for borrower bargaining power. Most important, consistent with literature and industry practice we argue that the loan spread is the contractual term that is fixed last and, therefore, most likely to be

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<sup>10</sup> The fact that there are differences in the probability of default for borrowers from the same rating grades (i.e. the risk of default is not exactly the same, only similar) does not explain the variation in loan spreads since the loan pricing models of banks are based on discrete rating grades, not on continuous probabilities scales. However, it is likely that bargaining power helps borrowers to *achieve* lower loan spreads if their default risk is below average within a rating grade.

<sup>11</sup> The dominant view in the literature implies that bargaining power is negatively correlated with the overall default risk of a borrower, i.e. riskier borrowers have less bargaining power (e.g., Uchida, 2006). However, one might also argue that high-risk borrowers exhibit a high bargaining power if they are at the edge of default (or in default) and the bank cannot afford to liquidate the borrower immediately. This opens room for renegotiations, raising the bargaining power of such borrower.

subject of bargaining (e.g., Bharath, Dahiya, Saunders and Srinivasan, 2008; Kirschenmann and Norden, 2008; Standard and Poor's 2006).<sup>12</sup> In addition, there are further important reasons why the spread might be related to bargaining: (i) there is room for upward and downward bargaining on the loan spread (unlike collateral since supply is limited on the borrower side), (ii) the spread is the basis for bank competition in credit markets, and (iii) the contracted spread directly affects the borrower's financial statements and cash flows (unlike collateral). Thus, POWER1 is our most preferred measure.

Nonetheless, we also take into account potential bargaining about collateral (POWER2) and the interaction between loan pricing and collateral requirements (POWER3). This is important to consider potential effects arising from an endogeneity of loan terms. In particular, the literature (theory and empirical work) is not conclusive about the question in which situations contracted loan spreads and collateral work in the same or opposite direction (e.g., Dennis, Nandy and Sharpe, 2000; Brick and Palia 2007). Hence, positive bargaining effects based on loan spreads might be *amplified* or *mitigated* by bargaining on collateral. This effect will be captured by the measure POWER3.

Finally, we argue that the loan approval decision (based on the credit rating) as well as the non-price terms of bank loans (e.g., loan purpose, loan type, amount, maturity) are less or not subject to bargaining. The main reason why loan approval (credit availability) is unlikely to be subject to bargaining is that this decision is based on non-compensatory objectives. The bank defines an acceptable range for the probability of default (based on credit rating and scoring systems) and approves all loan applications within this range. If a borrower is beyond the cut-off point it is very rare that the bank trades off the elevated level of default risk with tighter loan terms. Instead, banks typically prefer to reject these loans without any further bargaining. An additional reason is that the large majority of firms that apply for bank loans

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<sup>12</sup> Given this order in the loan contracting process potential endogeneity problems associated with the definition of our proxy for borrower bargaining power are minimized. In addition, the spread is fixed after the bank has assigned a credit rating to the borrower (which excludes endogeneity at this level), i.e. there is a causal relationship going from the rating to the spread.

get an approval (e.g., more than 90% in the raw data set from the U.S. used in this study). Eventually, non-price terms in loan contracting are usually pre-defined by the borrower's investment opportunities, and therefore less subject to bargaining than the loan spread.

With regard to our bargaining power measures, we find that the Spearman rank correlation between POWER1 and POWER2 in the German sample is significantly positive (0.10, p-val. < 0.01) and significantly negative in the U.S. sample (-0.13, p-val. < 0.01), indicating a different role for collateral in both countries. This represents a further reason why we consider POWER1 as the most robust proxy for effects arising from borrower bargaining power.

## **4. Empirical results**

### *4.1. Univariate results*

To gain first insights on the influence of hard and soft information on borrower bargaining power we calculate rank correlations. Table 2 reports the pairwise Spearman rank correlation coefficients between the type of information<sup>13</sup>, firm size (based on the natural logarithm of total sales) and the bargaining power measures POWER1, POWER2, and POWER3.

(Insert Table 2 here)

Panel A indicates the correlations for the German sample. Five out of six numbers are negative, indicating that a worse evaluation is associated with lower bargaining power. Most important, the correlation between borrower bargaining power and soft information ranges between -0.16 and -0.19. Interestingly, these coefficients are all significantly different from zero and clearly stronger than the link with hard information (which is only significant in the case of POWER1). In addition, we find that larger SMEs have more bargaining power. Panel

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<sup>13</sup> In the German sample we use FINRAT as proxy for hard information and MGRAT for soft information, both measured on a scale from 1 (best) to 6 (worst). In the U.S. sample we use CREDIT\_SCORE for hard information (higher number, higher default risk) and EDU, EXPER and AGE as proxies for soft information (higher values indicate more favorable information).

B shows very similar findings for the U.S. All correlations between soft information (EDU, EXPER, and AGE) and POWER1 are significantly positive while hard information is not significant at all. In contrast to the German sample, hard information is significantly related to POWER2. In addition, the correlation between firm size and bargaining power is significantly positive for POWER1 and negative for POWER2.

The results from this univariate analysis are consistent in both samples and confirm our hypothesis that soft information significantly affects borrower bargaining power, in particular for POWER1. There is also clear evidence that the assessment of soft information is a more important determinant for bargaining power than information on hard facts. The weaker results for POWER2 and POWER3 support our view that the loan spread is more likely to be the subject of bargaining than collateral. Finally, a closer look at the cross-country differences in the results for POWER3 (rightmost column) suggests that loan spreads and collateral serve as *complements* (spread and collateral are used as mutually reinforcing loan terms) in Germany and *substitutes* in the U.S (spread and collateral are traded off). This is confirmed by a positive correlation between loan spreads and collateral in the German sample (Spearman rank correlation = 0.16) and a negative correlation between these variables in the U.S. sample (Spearman rank correlation = -0.15).

#### 4.2. Multivariate results

We now analyze how the type of information affects borrower bargaining power by means of multivariate probit regression models for the German and U.S. sample. The main goal is to examine which type of information matters more. For this purpose, we estimate the likelihood of high borrower bargaining power (POWER1=1, POWER3=1). Explanatory variables for the German sample are the assessment of hard facts (FINRAT), soft facts (MGRAT) and control variables (borrower and relationship characteristics as proxies for borrower transparency and

asymmetric information in the bank relationship as well as bank and year fixed effects).<sup>14</sup> For the U.S. sample, we use the credit score (CREDIT\_SCORE, on a reverse scale, i.e. higher numbers correspond to higher default risk) as proxy for hard information and EDU and EXPER as proxies for soft information (non-financial factors of borrower quality).<sup>15</sup> In addition, we also include control variables (borrower and relationship characteristics as well as the Hirshman-Herfindahl index to consider effects from bank competition). For each sample we estimate four models (two models including the information variables only and two full models for POWER1 and POWER3 respectively). Table 3 reports the results.

(Insert Table 3 here)

The regression results are strikingly clear and consistent across both samples: soft information matters for borrower bargaining power. Both Panel A and B indicate that soft information (negative coefficient of MGRAT in the German sample; positive coefficients of EDU or EXPER in the U.S. sample) is associated with higher borrower bargaining power, regardless whether we use POWER1 or POWER3 as dependent variable. In particular, the level of education (EDU) turns out to be an important determinant. In contrast, hard information is not related to borrower bargaining power at all. These results confirm the univariate analysis from the previous Section and they are not driven by the correlation between hard and soft information. We obtain highly similar results if we run the regressions separately, including either the proxy for hard facts or soft facts. Furthermore, firm size (SALES) has a consistently positive impact on borrower bargaining power.

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<sup>14</sup> Including dummy variables for each of the rating grades (German sample: FINRAT, MGRAT; U.S. sample: CREDIT\_SCORE) with the best grade as reference category instead of taking the ordinal variables leads to identical results. Moreover, if we orthogonalize MGRAT and FINRAT (or vice versa) using a modified Gram-Schmidt procedure we still obtain that the orthogonalized variable MGRAT is significantly negatively related to borrower bargaining power and FINRAT not.

<sup>15</sup> We cannot include AGE (age of the firm owner) as a further variable because it is strongly positively correlated with EDU and EXPER. In this context, it is noteworthy that Cerqueiro, Degryse and Ongena (2007) show that AGE is positively related to “discretion” in loan pricing.

Summarizing, we conclude that soft information has a significant impact on borrower bargaining power. The result is robust to different definitions of bargaining power and across samples.

#### *4.3. Additional empirical checks*

We conduct some additional empirical checks to extend the previous analysis in two directions. Given the significantly positive impact of soft information on borrower bargaining power we subsequently shed light on the influence of differences in the assessment of hard and soft facts (e.g., soft facts more favorable than hard facts or vice versa) and the persistence of borrower bargaining power over time. Furthermore, we investigate two important alternative explanations and find that they can be ruled out.

To analyze the first issue we define the variable HMS (“hard minus soft”), measuring the differential assessment of hard and soft facts (both are measured on an ordinal scale with higher numbers indicating worse outcomes). A higher value of HMS indicates a better evaluation of soft facts relative to hard facts. HMS ranges from -5 to 5 in the German sample since the rating for hard facts (FINRAT) and soft facts (MGRAT) are measured on a six-grade scale. For the U.S. sample, we transform the credit score into a binary variable which equals zero for scores from 1 to 3 and one for scores from 4 to 6. In addition, the variable indicating the level of education is transformed to 0 if education is relatively high (EDU assumes the value 6 or 7) and zero otherwise. Accordingly, HMS ranges from -1 to 1 in the U.S. sample. Univariate tests indicate that a more favorable relative evaluation of soft facts is associated with a higher borrower bargaining power. For example, the values of HMS amount to 0.88 (POWER3=1), 0.97 (POWER3=2), and 1.25 (POWER3=3) in the German sample, indicating that a better evaluation of soft facts is associated with more bargaining power (the difference in HMS between POWER2 and POWER3 is statistically significant at the 0.05-level). We

now turn to the multivariate analysis for the German and U.S. sample. Results are reported in Table 4.

(Insert Table 4 here)

Interestingly, the coefficient of HMS is highly significant and positively associated with POWER1 in the German and U.S. sample. In addition, we observe a similar, slightly weaker result for the less preferred measure POWER3.<sup>16</sup> Based on these multivariate results we conclude that borrower bargaining power increases the more favorable the evaluation of soft relative to hard facts.

In a next step we examine the stability of borrower bargaining power over time. This is an interesting issue since it relates to the underlying economic forces leading to bargaining power. Based on the findings that soft information tends to be evaluated more favorably and less volatile over time than hard information (e.g., Grunert, Norden and Weber 2005), we hypothesize that borrower bargaining power is relatively stable over time. In other words, “bargaining power today” can be expected to be positively correlated with “bargaining power tomorrow”. We believe that this view is reasonable as long as the firm operates under regular conditions (same management<sup>17</sup>, same products, same strategy, etc.). To test this hypothesis empirically, we re-calculate the measure POWER1 based on rating- and year-specific median loan spreads (e.g., POWER1=1 if loan spread for borrower *i* is below the median loan spread for same-rated firms in the same year). We then calculate lag 1 and lag 2 of the year-specific bargaining measure and test whether POWER1(*t*-1) and POWER(*t*-2) are significant predictors for POWER(*t*). For this purpose, the panel structure of the German data set is well-

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<sup>16</sup> The reason for this finding is the following. HMS is significantly related to POWER1 but not to POWER2. Consequently, the statistical link between HMS and POWER3 becomes weaker.

<sup>17</sup> We do not have information on management turnover. Hence, we cannot study bargaining power effects arising from management replacement, succession, layoffs, etc.

suited whereas the cross-sectional data from the U.S. does not allow to conduct a similar test. Table 5 summarizes the estimation results.<sup>18</sup>

(Insert Table 5 here)

The regressions analyses reveal a clear result. We find that our most preferred measure of borrower bargaining power exhibits a significant persistence over time. Specifically, the coefficient of  $POWER(t-1)$  is highly significant and positive while lag 2 turns out to be insignificant. Hence, bargaining power exhibits a considerable stability over time, consistent with the strong influence of soft facts and the above mentioned characteristics of the latter (better evaluation and lower intertemporal variability<sup>19</sup> than hard facts).

We now turn to potentially alternative explanations of our previous results. First, one may argue that our findings are driven by ratings manipulation, in particular the assessment of soft facts. If the borrower and the loan officer have aligned incentives, i.e. both intend to grant the loan anyway, the credit rating for soft facts might exhibit a positive bias. This incentive structure is not unlikely if the borrower has relatively urgent liquidity needs and the loan officer's pay is based on volume which has been the standard for many years and in many countries (Udell, 1989). Moreover, a manipulation of soft information might be more difficult to detect (or easier to implement) in comparison to a manipulation of hard facts (e.g., Hertzberg, Liberti, and Paravasini, 2008).

We believe that this explanation can be ruled out for several reasons. First, banks rely on credit ratings and scores for various management purposes (e.g., loan approval, loan pricing, loan monitoring, loan loss provision, economic capital requirements, etc.) as well as, recently,

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<sup>18</sup> Instead of cross-sectional time-series pooled OLS estimations (with heteroskedasticity-adjusted standard errors and controlling for clustering on borrowers) we have also applied the random-effects panel estimator and obtain very similar findings. In particular, bargaining power turns out to be serially correlated at lag of one year (but not over two years) within borrowers.

<sup>19</sup> In the German sample the standard deviation of MGRAT is 1.22 whereas the one of FINRAT is 1.48.

for regulatory purposes (e.g., regulatory capital requirements, Basel II). Consequently, a ratings manipulation would do harm to their risk management and compliance with regulatory requirements. Second, a manipulation of the credit score by a U.S. bank is highly unlikely since it comes from a third-party provider (Dun & Bradstreet). In addition, the non-financial variables education, business experience and age of the owner (EDU, EXPER and AGE) represent raw data that can relatively easily be verified and, therefore, the evaluation is completely unambiguous. For the German sample, a manipulation of soft facts might improve the overall rating but this does not affect our measures of relative borrower bargaining power. In contrast, these measures exhibit a “built-in bias” against this manipulation effect because an upward-manipulated rating triggers a different benchmark for the loan spread (the median loan spread of the better rating grade) based on which we calculate the bargaining power measures. If the rating has been improved by one grade, the resulting spread tends to be lower. However, it is very likely that the new loan spread lies above the median spread of the better rating grade, i.e. our measure would indicate a low bargaining power. Third, a ratings manipulation should result into a lower ability to predict future borrower defaults. One cannot reasonably expect that a bank would tolerate such a behavior. We check this issue by regressing the default status of the firm on the information on hard facts, soft facts and the overall credit rating. If soft facts are manipulated towards more favorable assessments we expect only a weak or no significant relation to future borrower defaults.<sup>20</sup> Table 6 presents the results.

(Insert Table 6 here)

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<sup>20</sup> This approach allows to test whether ratings are *substantially* manipulated. Unfortunately, we cannot examine whether ratings are *moderately* manipulated but the previous discussion as well as internal and external controls (e.g., internal asset quality review units, internal audits, external audits, bank supervisors) suggest that even a moderate manipulation is relatively unlikely. This reasoning is also the main motivation behind the so-called “use test”, a requirement for the recognition of bank internal rating systems to determine regulatory capital requirements (Basel Committee on Banking Supervision, 2006).

The findings from probit model estimations show that ratings manipulation is not a realistic explanation. For the German sample (Panel A), the coefficients of the contemporaneous ratings for hard, soft and overall ratings are all significantly positively related to future defaults events ( $DEF(t+1)$ ) at the 0.01-level. These results clearly show that the overall rating (RAT), as well as the evaluation of hard facts (FINRAT) and soft facts (MGRAT) are strongly related to the default risk of the borrowers and, therefore, not or very little manipulated. For the U.S. sample (Panel B) we get similar results: both the credit score from D&B and our proxy for soft information (EDU) are significantly positively related to the indicator of default risk (DEF). Note that we do not claim any causal relationships in this context: the main purpose here is to examine the *statistical* link between the ratings and default risk. Furthermore, one could argue that the probability of default varies even within the same rating grade and that causes different spreads. But in banking practice loan pricing is based on the rating and not on the exact estimation of a continuous probability of default. Therefore, it is not unlikely that (same-rated) firms who get better loan terms were better in bargaining with the bank.

A further alternative explanation for our findings might be that loan spreads are better ex ante proxies for the risk of default than ratings information. This argument is not unrealistic since there is a substantial variation in loan spreads within a credit grade (which is also due to the collateral pledged by the borrower). It is possible that the bank uses additional information that goes beyond the constituents of the credit rating to set the loan rate (including the decision to grant secured vs. unsecured loans). If this information is highly default-sensitive, the contracted loan spread might be a better predictor of default than the credit ratings.<sup>21</sup> This reasoning is completely unrelated to bargaining power and leads to the empirical hypothesis that borrowers with loan spreads below the median loan spread for same-rated borrowers

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<sup>21</sup> However, if the bank has such information it is difficult to argue, given its relevance for default predictions, why it is not included in the credit rating.

exhibit a lower ex post default rate. We test this hypothesis for the German sample by regressing future defaults  $DEF(t+1)$  on the year- and borrower-specific bargaining power measure  $POWER1(t)$ , including bank and year-fixed effects. It turns out that the coefficient of  $POWER1(t)$  is negative but *not* statistically significant (p-val. = 0.373). The pseudo- $R^2$  is very low and mainly driven by the bank- and year-fixed effects; without the latter the pseudo- $R^2$  is almost zero. This outcome is also consistent with the fact that the credit ratings are highly related with future default events (see Table 6). Finally, for the U.S. sample we do not find a significant difference in estimated probability of default (based on the delinquency status 60 days past due during the last three years). Consequently, we rule out this alternative explanation.

## 5. Tests of robustness

In this section we briefly summarize findings from numerous tests of robustness that relate to variable definitions, model specifications, choices of samples and potential endogeneity problems.<sup>22</sup>

First, we repeat the main analysis for performing loans only (rating grades 1-4). It turns out that the influence of our proxies for soft information (MGRAT in the German sample; EDU and EXPER in the U.S. sample) on  $POWER1$  remains highly significant ( $p < 0.01$ ) and the estimated coefficient almost doubles (from -0.24 as reported in Table 3, Panel A, Model II to -0.46; similar for  $POWER3$  as dependent variable). For non-performing loans neither hard nor soft information is significantly related to bargaining power. Hence, our key results become even stronger when considering performing loans only.

Second, we consider alternative definitions of the bargaining power measure. Specifically, we have estimated a two-stage multivariate regression model to obtain the new binary measure  $POWER4$ , taking into account simultaneous effects coming from bargaining on loan

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<sup>22</sup> We do not show tables to conserve space. However, detailed results are available from the authors on request.

spreads and collateral in a different way than POWER3. This allows us to address potential concerns about endogeneity in an elegant manner. At the first stage, we regress the observed loan spread on the bank-internal ratings (CREDIT\_SCORE, EDU, EXPER) and the ratio of collateral relative to loan size (the indicator variable for secured loans) for the German sample (U.S. sample) to obtain predicted loan spreads. POWER4 equals one if actual loan spread is smaller than the predicted loan spread, and zero otherwise. The rank correlation with POWER1 is 0.48, indicating that this measure is different but still positively related with our previous measures. We then re-estimate the main regression models (without and without control variables) for the German and U.S. sample and get very similar results as in Table 3. In addition, we have also re-defined POWER1 and POWER2 based on terciles to make a sharper distinction between borrower with high, neutral, and low bargaining power.<sup>23</sup> Again we find that soft information has significant influence. In the German sample the results for POWER1 are driven by the difference between the mid and upper tercile whereas the difference between the lower and mid tercile matters for POWER2.

Third, the loan data in the German sample comes from six different banks that are not equally represented in the sample (one bank is slightly overrepresented with a share of 23% of all observations). To address potential supply side effects we have excluded this bank or included an indicator variable for the bank in the main regression models (instead of using individual bank fixed effects). It turns out that we obtain results that are highly similar to those reported in Table 2 and 3.

Fourth, the analysis in the German sample refers to loan spreads from lines of credit only whereas our findings for the U.S. sample are based on different loan types. To make the samples comparable with respect to the loan type we select all lines of credit from the U.S.

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<sup>23</sup> We have also investigated whether the magnitude of borrower bargaining power (instead of binary indicators or ordinal measures) relates to soft information. For this purpose, we created a measure that is based on the difference between borrower's actual loan spread and median spread for same-rated borrowers and standardized this measure to the interval (0, 1). Then, we estimated Tobit regression models (because of the two-sided censoring) with the same explanatory variables as in Table 3. The analysis reveals that soft information also significantly positively relates the *magnitude* of borrower bargaining power in both samples.

sample (1,110 out of 1,761), re-estimate the main regressions and get very similar findings. In addition, if we distinguish between bargaining on new lines of credit and renewals we cannot find any significant difference. In both cases soft information (and not hard facts) is significantly related to POWER1.

Fifth, instead of using the variables EDU, EXPER and AGE of the first firm owner in the U.S. sample we have included weighted averages over all owners (as included in the SSBF 2003). Results remain very close to those reported in Section 3.

Sixth, in further analyses we also investigated whether physical distance (e.g., DeYoung, Glennon and Nigro, 2008) or the mode of communication, in particular “personal” vs. “impersonal” (e.g., Petersen and Rajan, 2002; Berger et al., 2005) affects the statistical significance or economic magnitude of our findings. It is noteworthy that none of these variables change our finding that the assessment of soft information is significantly associated with borrower bargaining power.

Finally, we examine the impact of continuous measures of hard facts instead of using the aggregated financial rating (FINRAT, CREDIT\_SCORE). One could argue that a finer differentiation of hard facts also affects borrower bargaining power. To analyze this question, we include two standard measures for profitability and capital structure (ROA, LEVERAGE) as explanatory variables. These factors are key inputs for the financial rating of firms in the U.S. and Germany. The results are displayed in Table 7.

(Insert Table 7 here)

For the German sample (Panel A) our previous results are basically unchanged. Again, a good rating for soft facts leads to higher bargaining power. The coefficients of ROA and LEVERAGE are not statistically significant. Turning to the U.S. sample (Panel B), the coefficients of the soft facts (EDU, EXPER) are highly significant and correctly signed in

Model I but become insignificant in Model II (however, the financial ratios are also not significant). In summary, the positive influence of soft facts is mainly confirmed even when finer, continuous measures of hard facts are included in the regressions instead of the financial ratings.

## **6. Conclusions**

Bargaining and information are key elements of loan contracting. We examine the relation between borrower bargaining power and the type of information available to the bank. In the absence of reliable data on ex ante preferences of banks and borrowers, we define ex post measures of relative borrower bargaining power based on the variation of loan terms within rating grades and analyze their relation to hard and soft information.

Based on data from two samples of small business lending (U.S. and Germany), we find support for the hypothesis that the assessment of soft information is significantly positively related to borrower bargaining power. In addition, a more favorable evaluation of soft facts relative to hard facts is associated with higher borrower bargaining power. Most important, these two results provide evidence in favor of *second order effects* from soft information. The latter does not only affect the rating level but also influences loan terms within rating grades. Moreover, borrower bargaining power also persists over time which is consistent with the lower intertemporal variability of soft information and incompatible with a random allocation. Finally, we rule out that the results are driven by ratings manipulation or statistical limitations of the rating systems. A series of robustness tests confirm the previous findings.

Our study has several implications for banks and firms and offers interesting avenues for further research. First, both bargaining power and soft information relate to the strength of the bank-borrower relationships. Hertzberg, Liberti, Paravasini (2008) show that loan officer turnover is an effective device to maintain *incentives* inside the bank, i.e. to avoid collusion between loan officers and borrowers. Our study suggests that a more favorable assessment of

soft facts increases borrower bargaining power. Since the evaluation of soft facts depends, among other factors, on the loan officer's experience with the borrower it is reasonable that new loan officers tend to make an "average assessment" (to avoid being too strict or too generous, trading off the risk assessment and lending volume). Consequently, loan officer rotation helps to avoid a systematic drift towards an increasing borrower bargaining power over time, either arising from gradually increasing accuracy of the loan officer's assessment or from collusion. Second, a related implication is that loan officers might have to bear the negative consequences individually arising from high borrower bargaining power. If they are paid according to the contracted loan rate margins, lower spreads would reduce their variable *compensation*. Third, there are also implications for *bank competition*. For example, the number and structure of bank relationships as well as switching costs of borrowers might relate to the interaction between bargaining power and soft information in banking. Furthermore, analyzing how our findings on bargaining power and soft information relate to the literature on *information sharing* is beyond the scope of this paper. Finally, from the perspective of firms our results are good news insofar that a successful communication of the corporate strategy, business experience and management skills can significantly improve the terms of bank loans.

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Table 1: Summary statistics

The data comes from 1,062 loans to German firms granted by six large banks during the period 1992-1996 and 1,761 loans to U.S. firms as included in the SSBF 2003.

Panel A: German sample					
Category	Variable	Definition	Median	Mean	N
<i>Type of information</i>					
Hard	FINRAT	Rating for hard facts (financial statements), scale of 1 (best) to 6 (worst)	4	3.66	820
Soft	MGRAT	Rating for soft facts (management skills), scale of 1 (best) to 6 (worst)	2	2.69	742
<i>Borrower characteristics</i>					
	SALES	Log of total sales (DEM)	11.59	11.55	913
	TA	Log of total assets (DEM)	11.13	11.17	915
<i>Bank relationship characteristics</i>					
	DURATION	Log of the length of the bank relationship (months)	5.25	5.10	1,002
	NUMBANK	Log of the number of bank relationships	1.61	1.54	917
	HOUSEBANK	Main bank (dummy)	0	0.39	1,062
	CREDIT_LINE	Existence of a line of credit (dummy)	1	0.85	1,062
<i>Loan terms</i>					
	SPREAD	Spread on line of credit (percentage pts)	3.63	3.64	761
	COLLAT	Collateral relative to credit exposure (%)	29.72	35.91	1,062

Table 1: Summary statistics (continued)

Panel B: U.S. sample					
Category	Variable	Definition	Median	Mean	N
<i>Type of information</i>					
Hard	CREDIT_SCORE	Credit score based on financials and payment information, scale from 1 (best) to 6 (worst), included in reverse order of D&B code	3	3.03	1,756
Soft	EDU	Education of main owner, scale from 1 (lowest) to 7 (highest)	6	4.75	1,708
	EXPER	Expertise of main owner (years)	23	23.34	1,708
	AGE	Age of main owner (years)	53	53.50	1,708
<i>Borrower characteristics</i>					
	SALES	Log of total sales (USD)	14.65	14.45	1,752
	TA	Log of total assets (USD)	13.67	13.51	1,751
	FIRM_AGE	Age of firm (years)	16	18.28	1,761
	URBAN	Firm comes from metropolitan area (dummy)	1	0.77	1,761
	WHITE	Main owner is white (dummy)	1	0.95	1,708
	FEMALE	Main owner is female (dummy)	0	0.16	1,708
	MANAGE	Main owner is manager (dummy)	1	0.83	1,708
	NUMBANK	Log of the number of bank relationships	1.10	1.12	1,760
<i>Bank relationship characteristics</i>					
	DURATION	Log of the length of the relationship (months)	4.27	3.89	1,761
	DISTANCE	Log of the bank-borrower distance (miles)	1.79	2.06	1,760
	CHECK	Existence of a checking account (dummy)	1	0.99	1,761
	SAV	Existence of a savings account (dummy)	0	0.33	1,761
	CREDIT_LINE	Existence of a line of credit (dummy)	1	0.78	1,761
<i>Loan terms</i>					
	SPREAD	Spread on most recent loan (percentage pts)	3.23	3.38	1,761
	COLLAT	Loan is secured (dummy)	1	0.55	1,761
<i>Competition</i>					
	HHI	Hirshman-Herfindahl Index, scale from 1 (low concentration) to 3 (high concentration)	2	2.41	1,761

Table 2: Rank correlation between the type of information, borrower size, and bargaining power

This table shows the Spearman rank correlation coefficients between the evaluation of hard (FINRAT; CREDIT\_SCORE) and soft facts (MGRAT; EDU, EXPER, and AGE) and the measures of borrower bargaining power (POWER1 equals to 1 if the loan spread is below the median loan spread for same-rated borrowers; POWER2 equals to 1 if the collateral relative to the loan amount is below the median ratio for same-rated borrowers; POWER3 is the sum of POWER1 and POWER2). LARGE equals to 1 if total SALES exceeds the median of SALES and 0 otherwise. The data comes from 1,062 loans to German firms granted by six large banks during the period 1992-1996 and 1,761 loans to U.S. firms as included in the SSBF 2003. \*\*\*, \*\*, \* denote correlation coefficients that are statistically significant at the 0.01, 0.05, and 0.10-level.

Panel A: German sample				
Information		Measure of borrower bargaining power		
		POWER1	POWER2	POWER3
Hard	FINRAT	-0.09**	-0.01	-0.07*
Soft	MGRAT	-0.19***	-0.16***	-0.19***
Size	LARGE	0.13***	0.13***	0.18***

  

Panel B: U.S. sample				
Information		Measure of borrower bargaining power		
		POWER1	POWER2	POWER3
Hard	CREDIT_SCORE	-0.00	-0.04**	-0.03
Soft	EDU	0.05**	0.02	0.06**
	EXPER	0.08***	-0.07***	0.01
	AGE	0.17***	-0.03	0.03
Size	LARGE	0.17***	-0.19***	-0.01

Table 3: Relative borrower bargaining power, hard and soft information

The dependent variables POWER1 (0, 1) or POWER3 (0, 1, 2) measure the relative borrower bargaining power. Models I and II are probit models, models III and IV are ordered probit models. Explanatory variables in Panel A are the financial rating (FINRAT), the non-financial rating (MGRAT), the natural log of total SALES, a variable indicating whether the lender is the housebank (HOUSEBANK), an integer variable counting the number of bank relationships (NUMBANK), the duration of the bank-firm relationship (in years), and bank and year fixed effects. The data comes from 1,062 loans to German firms granted by six large banks during the period 1992-1996. Explanatory variables in Panel B are the CREDIT\_SCORE from D&B, the education (EDU), business experience (EXPER), the log of total SALES, the log of the number of bank relationships (NUMBANK), the color (WHITE) and gender (FEMALE) of the owner. DURATION is the log-length of the bank relationship (in months) and DISTANCE the physical distance in miles between the borrower and his bank. HHI\_2 and HHI\_3 are indicator variables (with HHI\_1 as reference category) for local bank competition, based on the Hirshman-Herfindahl index. The data comes from 1,761 loans to U.S. firms as included in the SSBF 2003. All regressions are based on OLS estimation and consider the clustering of observations at the borrower level and p-values are calculated from Huber-White robust standard errors. \*\*\*, \*\*, \* denote coefficients that are statistically significant at the 0.01, 0.05, and 0.10-level.

Panel A: German sample

Dep. Var.:	Model I (Probit)		Model II (Probit)		Model III (Ordered probit)		Model IV (Ordered probit)	
	POWER1		POWER1		POWER3		POWER3	
	Coeff.	p-val.	Coeff.	p-val.	Coeff.	p-val.	Coeff.	p-val.
FINRAT	0.0570	0.240	0.0943	0.122	0.0419	0.307	0.0626	0.201
MGRAT	-0.1943 ***	0.004	-0.2398 ***	0.004	-0.1629 ***	0.006	-0.1471 **	0.040
SALES			0.3128 ***	0.002			0.2178 ***	0.008
HOUSEBANK			-0.1017	0.577			-0.0892	0.575
NUMBANK			-0.1644	0.192			0.0489	0.741
DURATION			-0.1253	0.207			-0.0982	0.329
Bank fixed effects	Yes		Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes		Yes	
Obs.	571		424		571		424	
Pseudo-R <sup>2</sup>	0.1920		0.2555		0.0785		0.0970	

Table 3: Relative borrower bargaining power, hard and soft information (continued)

Panel B: U.S. sample										
Dep. Var.:	Model I (Probit)		Model II (Probit)		Model III (Ordered probit)		Model IV (Ordered probit)			
	POWER1		POWER1		POWER3		POWER3			
	Coeff.	p-val.	Coeff.	p-val.	Coeff.	p-val.	Coeff.	p-val.	Coeff.	p-val.
CREDIT_SCORE	0.0122	0.565	0.0128	0.556	-0.0226	0.238	-0.0286	0.139		
EDU	0.0426 ***	0.007	0.0295 *	0.069	0.0342 **	0.016	0.0387 ***	0.007		
EXPER	0.0088 ***	0.001	0.0072 **	0.014	0.0006	0.807	0.0022	0.406		
SALES			0.0953 ***	0.000			-0.0106	0.491		
NUMBANK			-0.0185	0.821			-0.0708	0.328		
WHITE			-0.0946	0.500			-0.0180	0.870		
FEMALE			-0.0781	0.373			-0.1258	0.103		
DURATION			-0.0684 ***	0.001			-0.0029	0.870		
DISTANCE			-0.0053	0.795			-0.0245	0.147		
HHI_2			0.0634	0.630			0.0372	0.761		
HHI_3			0.0039	0.977			-0.0833	0.494		
Obs.	1,703		1,695		1,703		1,695			
Pseudo-R <sup>2</sup>	0.0073		0.0252		0.0023		0.0062			

Table 4: Bargaining power and differential information on hard and soft facts

The dependent variables POWER1 (0, 1) or POWER3 (0, 1, 2) measure the relative borrower bargaining power. Models I is a probit model and models II an ordered probit model. The key explanatory variable is HMS (hard minus soft) measuring the difference in the assessment of hard and soft facts (both types of information are measured on an ordinal scale with higher numbers indicating worse outcomes). Accordingly, the higher the value of HMS the better the evaluation of soft facts. HMS ranges from -5 to 5 in the German sample (6-grade scale for FINRAT and MGRAT) and -1 to 1 in the U.S. sample (the credit score is transformed into a binary variable which equals to 0 for scores from 1 to 3 and equals to 1 for score from 4 to 6; the EDU indicator is transformed to 0 if education is relatively high (EDU assumes the value 6 or 7) and 0 otherwise). All regressions are based on OLS estimation and consider the clustering of observations at the borrower level and p-values are calculated from Huber-White robust standard errors. \*\*\*, \*\*, \* denote coefficients that are statistically significant at the 0.01, 0.05, and 0.10-level.

Panel A: German Sample						
Dep. Var.:	Model I (Probit)			Model II (ordered probit)		
	POWER1			POWER3		
	Coeff.		p-val.	Coeff.		p-val.
HMS	0.1269	**	0.033	0.0835	*	0.082
SALES	0.3308	***	0.001	0.2341	***	0.004
HOUSEBANK	-0.0989		0.592	-0.0910		0.567
NUMBANK	-0.1676		0.181	0.0437		0.766
DURATION	-0.1161		0.248	-0.0972		0.336
Bank fixed effects	Yes			Yes		
Year fixed effects	Yes			Yes		
Obs.	424			430		
Pseudo-R <sup>2</sup>	0.2481			0.1005		

Panel B: U.S. Sample						
Dep. Var.:	Model I (Probit)			Model II (ordered probit)		
	POWER1			POWER3		
	Coeff.		p-val.	Coeff.		p-val.
HMS	0.0955	**	0.041	0.0750	*	0.069
SALES	0.1057	***	0.000	-0.0010		0.947
NUMBANK	-0.0153		0.852	-0.0684		0.345
WHITE	-0.1326		0.343	-0.0280		0.789
FEMALE	-0.0449		0.602	-0.1092		0.152
DURATION	-0.0594	***	0.003	0.0020		0.906
DISTANCE	-0.0059		0.769	-0.0265		0.116
HHI_2	0.0641		0.627	0.0392		0.747
HHI_3	0.0071		0.0957	-0.00754		0.533
Obs.	1,695			1,695		
Pseudo-R <sup>2</sup>	0.0231			0.0041		

Table 5: Persistence of borrower bargaining power

The dependent variable  $POWER1_t$  (0, 1) measures the relative borrower bargaining power on a year-by-year basis. Explanatory variables are lag 1 and lag 2 of the dependent variable as well as the natural log of total SALES, a variable indicating whether the lender is the housebank (HOUSEBANK), an integer variable counting the number of bank relationships (NUMBANK), the duration of the bank-firm relationship (in years), and bank and year fixed effects. The data comes from the German sample. All regressions are based on OLS estimation and consider the clustering of observations at the borrower level and p-values are calculated from Huber-White robust standard errors. \*\*\*, \*\*, \* denote coefficients that are statistically significant at the 0.01, 0.05, and 0.10-level.

Dep. Var.:	Model I (Probit)			Model II (probit)		
	POWER1 <sub>t</sub>			POWER1 <sub>t</sub>		
	Coeff.		p-val.	Coeff.		p-val.
POWER1 <sub>t-1</sub>	0.6241	***	0.000	0.7963	***	0.000
POWER1 <sub>t-2</sub>				0.2230		0.173
SALES	0.2720	***	0.001	0.2131	**	0.022
HOUSEBANK	0.0205		0.886	0.1295		0.437
NUMBANK	0.0351		0.748	-0.0423		0.751
DURATION	-0.1438	*	0.070	-0.0690		0.474
Bank fixed effects	Yes			Yes		
Year fixed effects	Yes			Yes		
Obs.	550			382		
Pseudo-R <sup>2</sup>	0.1179			0.1545		

Table 6: The relation between hard and soft information and default risk

For the German sample, the dependent variable  $DEF_{t+1}$  equals to one if there is a jump to default in the following year, and zero otherwise. Explanatory variables are the rating based on financials (FINRAT), the rating based on soft facts (MGRAT) and the overall rating (RAT). For the U.S. sample, the dependent variable DEF equals to one if the firm was at least once delinquent 60 days or more on one of his business obligations during the past three years. Explanatory variables are the credit score (CREDIT\_SCORE) in reverse order (higher numbers indicate riskier borrowers) and binary variable for the level of education of the firm owner (EDU).

Panel A: German sample

Dep. Var.:	Model I (Probit)			Model II (Probit)			Model III (Probit)		
	DEF <sub>t+1</sub>			DEF <sub>t+1</sub>			DEF <sub>t+1</sub>		
	Coeff.		p-val.	Coeff.		p-val.	Coeff.		p-val.
FINRAT	0.34	***	0.000						
MGRAT				0.28	***	0.000			
RAT							0.55	***	0.000
Bank fixed effects	Yes			Yes			Yes		
Year fixed effects	Yes			Yes			Yes		
Obs.	572			572			572		
Pseudo-R <sup>2</sup>	0.2310			0.1721			0.2653		

Panel B: U.S. sample

Dep. Var.:	Model I (Probit)			Model II (Probit)			Model III (Probit)		
	DEF			DEF			DEF		
	Coeff.		p-val.	Coeff.		p-val.	Coeff.		p-val.
CREDIT_SCORE	0.32	***	0.000				0.33	***	0.000
EDU				-0.14	**	0.041	-0.13	*	0.069
Obs.	1,703			1,703			1,703		
Pseudo-R <sup>2</sup>	0.1096			0.0023			0.1094		

Table 7: Relative borrower bargaining power, financial ratios and soft information

The dependent variable POWER1 (0, 1) measures the relative borrower bargaining power. Explanatory variables in Panel A are the return on assets (ROA), the leverage (total debt to total equity, LEVERAGE), the non-financial rating (MGRAT), the natural log of total SALES, a variable indicating whether the lender is the housebank (HOUSEBANK), an integer variable counting the number of bank relationships (NUMBANK), the duration of the bank-firm relationship (in years), and bank and year fixed effects. The data comes from 1,062 loans to German firms granted by six large banks during the period 1992-1996. Explanatory variables in Panel B are the return on assets (ROA), the leverage (total debt to total equity, LEVERAGE), the education (EDU), business experience (EXPER), the log of total SALES, the log of the number of bank relationships (NUMBANK), the color (WHITE) and gender (FEMALE) of the owner. DURATION is the log-length of the bank relationship (in months) and DISTANCE the physical distance in miles between the borrower and his bank. HHI\_2 and HHI\_3 are indicator variables (with HHI\_1 as reference category) for local bank competition, based on the Hirshman-Herfindahl index. The data comes from 1,761 loans to U.S. firms as included in the SSBF 2003. All regressions are based on OLS estimation and consider the clustering of observations at the borrower level and p-values are calculated from Huber-White robust standard errors. \*\*\*, \*\*, \* denote coefficients that are statistically significant at the 0.01, 0.05, and 0.10-level.

Panel A: German sample

Dep. Var.:	Model I (Probit)		Model II (Probit)	
	POWER1		POWER1	
	Coeff.	p-val.	Coeff.	p-val.
ROA	-0.0031	0.468	-0.0004	0.910
LEVERAGE	0.0011	0.651	0.0014	0.570
MGRAT	-0.1545 **	0.022	-0.1313 *	0.082
SALES			0.3284 ***	0.005
HOUSEBANK			-0.1045	0.599
NUMBANK			-0.2422	0.109
DURATION			-0.0274	0.791
Bank fixed effects	Yes		Yes	
Year fixed effects	Yes		Yes	
Obs.	409		356	
Pseudo-R <sup>2</sup>	0.2337		0.2570	

Panel B: U.S. sample

Dep. Var.:	Model I (Probit)		Model II (Probit)	
	POWER1		POWER1	
	Coeff.	p-val.	Coeff.	p-val.
ROA	-0.0088	0.708	0.0058	0.811
LEVERAGE	0.1791	0.466	-0.0169	0.513
EDU	0.0473 **	0.020	0.0279	0.188
EXPER	0.0080 **	0.023	0.0048	0.208
SALES			0.1220 ***	0.000
NUMBANK			0.0755	0.477
WHITE			0.3104 *	0.086
FEMALE			0.0433	0.724
DURATION			-0.0789 ***	0.003
DISTANCE			-0.0030	0.911
HHI_2			0.0872	0.636
HHI_3			-0.0119	0.948
Obs.	1,043		1,040	
Pseudo-R <sup>2</sup>	0.0076		0.0363	