

# **Bargaining power and renegotiation of small private debt contracts**

**José Valente**

University of Coimbra, CeBER, Faculty of Economics  
Av. Dias da Silva, 165, 3004-512, Coimbra  
[valente\\_filho@hotmail.com](mailto:valente_filho@hotmail.com)  
ORCID: 0000-0002-8498-9711

**Mário Augusto**

University of Coimbra, CeBER, Faculty of Economics  
Av. Dias da Silva, 165, 3004-512, Coimbra  
[maugusto@fe.uc.pt](mailto:maugusto@fe.uc.pt)  
ORCID: 0000-0001-7345-1679

**José Murteira**

University of Coimbra, CeBER, Faculty of Economics  
Av. Dias da Silva, 165, 3004-512, Coimbra  
[jmurt@fe.uc.pt](mailto:jmurt@fe.uc.pt)

*This is a post-peer-review, pre-copyedit version of an article published in [Annals of Finance]. The final authenticated version is available online at: <http://dx.doi.org/10.1007/s10436-022-00413-y>*

Corresponding author: José Valente

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## **Abstract**

The present study is focused on the renegotiation of small debt contracts for small and medium-sized enterprises (SMEs). We use a proprietary database from a Brazilian bank and find that, when compared to large loans, the probability of renegotiation of small loans is much lower. We argue that this is due to the lack of *ex-ante* contingencies in this kind of loan, which reduces the transfer of control to the lender in situations in which the borrower is not in financial distress, and to the lower bargaining power of SMEs when compared to large public companies. We find that borrower delinquency events and borrower bargaining power proxies are positively related to the probability of small loan renegotiation. We also find that delinquency events reduce the probability of borrower-friendly outcomes as well as the number of key contractual terms renegotiated favorably to the borrower. Further, we find that the borrower's bargaining power increases the likelihood that the borrower will obtain a favorable outcome and a greater number of favorable key contractual terms in the outcome of the renegotiation.

*Keywords:* Loan renegotiation; control rights; bargaining power; small debt contracts.

*JEL classification :* D86; G21; M21.

## **1 Introduction**

A large body of theoretical literature on financial contracting has been devoted to ~~study~~ renegotiation, given the latter's implications for the efficiency of contracts and welfare of contracting parties (see, for example, Hart and Moore 1988, 1998; Huberman and Kahn 1988a, 1988b; Aghion and Bolton 1992; Bester 1994; Gorton and Kahn 2000; Gârleanu and Zwiebel 2009). This literature has been concerned mainly with the allocation of control rights at the inception of the agreement and the shifts of bargaining power until maturity (e.g., Aghion and Bolton 1992; Hart and Moore 1998). In this sense, the related empirical literature has been mostly focused on large companies with large debt contracts, publicly or privately placed, in which the allocation of control rights is usually specified through the presence of *ex-ante* contingencies like pricing grids, borrowing bases, and covenants (e.g., Dou 2020; Godlewski 2019; Nikolaev 2018). Prior empirical evidence showed that

renegotiation of these large debt contracts is triggered even in the absence of default by *ex-post* changes in the firm's financial health, which are monitorable by means of those *ex-ante* contingencies (e.g., Roberts 2015; Roberts and Sufi 2009a). The objective of the present study is to analyze the drivers of the renegotiation process and its outcomes, but unlike previous empirical works, we focus on small private debt contracts with small and medium-sized firms (SME). This type of contract generally does not include pricing grids, borrowing bases, or covenants due to the high *ex-post* verification costs of the state of the world. Specifically, we hypothesize that, in the absence of traditional *ex-ante* design contingencies of debt contracts, the renegotiation process and its outcomes are mainly driven by the contracting parties' relative bargaining power.

Theoretically, renegotiation is triggered by changes in the existing environment at the time of signing the contract. It would be the result of Pareto improvements motivated by inefficient *ex-post* outcomes, not foreseen at the contracting date (Maskin and Moore 1999). In corporate debt contracts, financial covenants are a device frequently used by creditors to monitor *ex-post* changes in borrowers' financial performance (Rajan and Winton 1995). In this sense, they are an important driver of renegotiation of those contracts. Considering that creditors rarely exercise the right to accelerate the debt whenever borrowers fail to meet covenant obligations, a renegotiation process is triggered as a result, usually with stronger contractual restrictions on the borrower (Nini et al. 2012). Thus, they are also a primary mechanism for allocating control rights and specifying, in the original contract, the *ex-post* shift of bargaining power that will determine the outcome of the renegotiation process (Gârleanu and Zwiebel 2009; Prilmeier 2017).

Conversely, many small private debt contracts with SME waive covenants and other *ex-ante* contingencies in their design. This is the case of the contracts in the sample employed in the present study, which includes loans with an average value of \$ 63,990 and firms with average assets of \$ 1.2 million. One possible explanation for the lender to waive covenants and other *ex-ante* contingencies in the design of these contracts lies in the relatively high cost associated with monitoring small loans to SME, comparatively to large debt contracts with big companies. In the absence of a contractual mechanism to incentivize the monitoring of *ex-post* changes in the borrower's financial performance, the only signal available to the bank that

something changed in the firm's situation after the contracting date is a missing payment.<sup>1</sup> Therefore, delinquency must be a primary determinant of the likelihood of renegotiation of small private debt contracts. Naturally, a missing payment strengthens the lender's bargaining power in a renegotiation process, possibly leading to stricter conditions for the borrower compared to the original agreement. In this study, we use a sample of small private loans from a large Brazilian bank to show that renegotiation of these contracts also takes place in contexts where there are no missing payments. As there are no contractual contingencies that encourage the bank to monitor the financial performance of the firm *ex-post* in order to increase its control even without a missing payment, this indicates that firms also initiate the process and suggests the borrower's bargaining power as another relevant driver of renegotiation of small private loans. Therefore, it is the bargaining power of the contracting parties that determines the renegotiation process for small private loans and its outcomes – with delinquency events clearly shifting the control towards the lender and thus increasing its bargaining power.

By addressing these issues, the present study aims at the following contributions to the financial contracting literature. Firstly, the study focuses on the influence of bargaining power on renegotiation, including its probability and outcomes. The idea of renegotiation as an exogenous game driven by the relative bargaining powers of the contracting parties is pervasive in the financial contracting literature (Roberts and Sufi 2009b). Surprisingly, previous empirical studies have not properly addressed this issue. We had access to data on borrowers' alternative sources of financing, which, according to theoretical literature, is crucial for determining the relative bargaining power and ultimate outcome of renegotiation (Rajan 1992).

Secondly, to the best of our knowledge, this is the first study to investigate renegotiation dynamics in a context in which there are no *ex-ante* contingencies to specify the distribution of control rights. The *ex-post* allocation of control rights is one of the main objectives of renegotiation but, so far, empirical studies have only addressed financial contracts with covenants and other *ex-ante* contingency

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<sup>1</sup> Theoretically, collateral also provides an incentive for the bank to monitor loans (Rajan and Winton 1995). However, collateral is used only in a minor part of the contracts in our sample, with reduced incentive for the bank to monitor this kind of loan.

provisions (Denis and Wang 2014; Roberts 2015), which are important instruments for distributing control rights. So, there is a gap to be filled by investigating the renegotiation process in our context. Finally, this study focuses on small unlisted firms located in a middle-income country, which are exposed to more information asymmetries than large companies and with fewer financing alternatives than firms located in the US or Europe. Thus, the study also aims at shedding light on the dynamics of renegotiation in an underdeveloped market.

The remainder of the paper is organized as follows: The next section presents the theoretical motivation for this study and formulates the hypotheses to be tested. Section 3 describes the variables, data, and econometric model employed. Section 4 reports and comments on empirical results. Finally, Section 5 concludes the paper with some implications related to the findings.

## **2 Theoretical motivation and research hypotheses**

The classic view on renegotiation sees it as a phenomenon that destroys contractual efficiency: It could only harm the parties involved in a contractual relationship, as it compromises the incentives to comply with the clauses initially established (Bolton 1990; Maskin and Moore 1999). Indeed, if there is any possibility that the contract, and occasional penalties for deviations therefrom, are subsequently modified, why bother to meet the original terms? In general, this strand of the literature considers that both parties have unbounded rationality, that is, they are able to foresee all future contingencies that may impact the interests involved and to describe them in detail in the original contract (Hart and Moore 1988). If, hypothetically, contracts are potentially complete, then any modification in the original clauses can never benefit the agents involved in the relationship – for if the renegotiation outcome were of any use it would simply be written in the initial agreement (Dewatripont and Maskin 1990). Therefore, a contract will only be efficient if it is renegotiation-proof.

Renegotiations are frequent in practice (Bolton 1990; Roberts 2015; Roberts and Sufi 2009a), which suggests that renegotiation may be better explained in the light of an alternative line of thought – the ‘incomplete contracts’ theory. According to this literature, specifying the precise actions each party must take in every alternative future event involves a prohibitive cost, especially when one considers

that the writing of such a large number of contingencies would have to be intelligible to an outside legal authority capable of enforcing the agreement (Hart and Moore 1988). In other words, even if the parties have unbounded rationality and conceive all possible contingencies, their detailed specification is very expensive, making it economically advantageous to have a mechanism that allows for the modification of the initial terms (as both parties receive information about costs and benefits). The upshot of this reasoning is that contracts are naturally incomplete and that renegotiation helps increase their efficiency by completing the initial agreement (Tirole 1999).

Aghion and Bolton (1992) argue that one way to overcome contracts' natural incompleteness is to establish in the contract who has the right to make decisions after the agreement is signed. They formulate a model in which an entrepreneur requires financing for an investment opportunity and claim that the optimal contract allocates control rights in a state-contingent way: When things go nicely and smoothly for the entrepreneur, he keeps control over the project financed. If things go sideways, the control is shifted towards the investor – which, in the case of debt contracts, could be a bank. In their model, the signal that things have gone wrong can be as diverse as a change in the project's net worth or profitability. This means that control rights can shift to creditors even in the absence of a missed payment. This is a fundamental difference from the Hart and Moore's (1998) model, in which the non-payment of debt is essential for creditors to take control of the assets. In other words, in the Aghion and Bolton contract, shifts in control depend on the confirmation of a verifiable state of the world – not a missed debt payment – whereas in the Hart and Moore contract, the shift in control towards creditors is triggered by a failure to pay.

This makes Hart and Moore's (1998) model more suitable for explaining the process of renegotiating small loans. Large and medium debt contracts usually include *ex-ante* provisions like pricing grids, borrowing bases, and financial covenants (Roberts and Sufi 2009a). Small loans, on the other hand, may waive such contingencies. Pricing grids makes the loan interest spread contingent on some specification about the borrower – for instance, credit ratings or financial ratios. Thus, a typical pricing grid may determine an increase in the loan spread if the firm's rating falls below some predefined threshold. Borrowing bases relate the amount of

credit available to the borrower to the value of the collateral. Financial covenants are more common and usually specify balance sheet ratios or figures with which the borrower must comply throughout the contract. These three kinds of contractual provisions require some monitoring by the bank after the contract is signed. In the event of a change in the conditions outlined in these contingencies, control may be transferred to the creditor. Covenants are central to the study of control rights outside the context of bankruptcy: As they accelerate the loan in case of violations, they increase the scope for renegotiation (Aghion et al. 1994; Demerjian 2017; Freudenberg et al. 2017). Empirical evidence has supported the idea that most renegotiations of debt contracts that include covenants take place outside financial difficulties (Roberts and Sufi 2009a). This is not the case of small loans, for which *ex-post* state of the world verification can be expensive and, as a result, *ex-ante* contingencies – like covenants – may be waived. For this type of loan, missed payments should represent a major – and indeed almost exclusive – signal received by the creditor that something has gone wrong, and, in this sense, it should be a significant variable to explain the likelihood of renegotiation of small debt contracts. *A priori*, borrower delinquency shifts control to the bank and should lead the latter to confiscate the assets pledged as collateral for the loan. However, the lender is usually a less efficient business manager than the borrower (Huberman and Kahn 1988a). Thus, renegotiation emerges naturally as a preferable alternative to bankruptcy, which may prove *ex-post* inefficient (Bester 1994) because it is more expensive for the bank than the renegotiation process (Ikeda and Igarashi 2016).<sup>2</sup> This rationale leads to the formulation of the following hypothesis:

**H1:** Borrower delinquency is positively related to the probability of renegotiation of small debt contracts.

One concept closely related to the contractual allocation of control rights is the relative bargaining power of the contracting parties. In this paper, we use the

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<sup>2</sup> As will be seen in the next Section, most debt contracts in our sample are unsecured. In such cases, the remaining alternative for the bank to enforce payment is to register the borrower in national credit restriction databases. This makes renegotiation an even more attractive alternative for the bank in the event of missed payments, as it is often the only way for the lender to recover the funds granted.

term bargaining power in a broad sense, referring to what determines the “share of the cake” between two parties involved in a specific transaction – the loan agreement. For example, a debt contract may establish that, in the event of default, the bank has the right to seize the assets of the financed project or other assets. Even if the threat to take the borrower’s assets is not met by the bank, the default transfers control to the bank, increasing its bargaining power and ultimately influencing the outcome of a possible renegotiation (Huberman and Kahn 1988a). We use the term in this wider sense.

In general, the idea that the bargaining power of contracting parties governs the renegotiation process permeates much of the financial contracting literature. Berger and Udell (1990) model renegotiation as a bargaining game between debtholders and shareholder-oriented management, in which managers credibly threatens to compromise firm assets to force concessions from the lenders. Aghion et al. (1994) formulate a model in which bargaining power is controlled contractually. The model is based on a buyer-seller relationship with observable but unverifiable investments. The authors show that the underinvestment problem can be overcome by including in the original contract the rules that will govern the future renegotiation process. In their model, all bargaining power is allocated to either contracting party. Similarly, Harris and Raviv (1995) propose that contracts specify the rules that govern the behavior of contract parties in determining outcomes and the allocations resulting from these outcomes. Gorton and Kahn (2000) claim that the initial terms of debt contracts are not set to price default risk, but to efficiently balance bargaining power in a later renegotiation that always occurs. In Moraux and Silaghi's (2014) model, the optimal number of debt renegotiations, the size and dynamics of the coupon reductions depend critically on the bargaining power of the contracting parties.

These models suggest that bargaining power is one of the main drivers of debt contract renegotiation. In the case of small debt contracts, the borrower’s relative bargaining power should be even more important as a trigger of renegotiation, given the lack of *ex-ante* contingencies that provide for shifts in control rights to the creditor. For example, pricing grids shift the relative bargaining power to the creditor by increasing interest rates in case the borrower’s credit quality deteriorates. Covenants play a similar role of implicitly allocating bargaining



power in a state-contingent manner, providing debt acceleration in the event of borrower's financial distress (Gârleanu and Zwiebel 2009). In this sense, covenants can increase the bank's bargaining power even in the absence of borrower's failure to pay (for example, in case the firm's earnings fall below some predetermined threshold). For small loans that waive such contingencies, the only contractual device that provides for an increase in the bank's bargaining power over the life of the loan is collateral, and only in cases of missed payments. In other contexts, the borrower's relative bargaining power should remain intact. This rationale suggests the second hypothesis:

**H2:** The borrower's bargaining power is positively related to the probability of renegotiation of small debt contracts.

The relative bargaining power of contracting parties explains not only the likelihood with which debt contracts are renegotiated, but also the outcome of renegotiation (e.g., Aghion et al. 1994; Hart and Moore 1988, 1998; Huberman and Kahn 1988a; Rajan and Winton 1995). For example, if the financial situation of a borrower improves and he has alternative sources of financing, he can credibly threaten to leave the current lender in order to obtain more favorable loan conditions in a renegotiation (Rajan 1992). The influence of the borrower's greater bargaining power can manifest itself not only in the higher probability of obtaining favorable loan terms in a renegotiation process, but also in "more" favorable conditions, that is, in the larger number of contract terms that are renegotiated in a way that favors the borrower with relative greater bargaining power. The next two hypotheses are derived from this reasoning:

**H3:** Borrowers with higher bargaining power have a higher probability of obtaining a favorable outcome in the renegotiation of small debt contracts.

**H4:** Borrowers with higher bargaining power obtain a larger number of terms renegotiated to their advantage in small debt contracts.

However, if, as predicted by Hart and Moore's (1998) model, borrower delinquency shifts contractual control towards the lender, the firm's bargaining power should lose strength in the event of any delay in debt payment. Consequently, the renegotiation outcome will not be as favorable to the borrower as it would be if there were no delinquency event. This logic leads to the formulation of the following hypotheses:

**H5:** Borrower delinquency reduces the probability of borrower-friendly outcomes in the renegotiation of small debt contracts.

**H6:** Borrower delinquency reduces the number of terms renegotiated favorably to the borrower in small debt contracts.

By means of the six hypotheses above, the present study tries to test theoretical predictions that point to the contracting parties' bargaining power as one of the main drivers of the renegotiation of small debt contracts. The empirical literature concerned with testing the drivers of the renegotiation process is still at an early stage. Related previous studies have not assessed the explanatory power of contracting parties' bargaining power, despite the theoretical importance of this attribute in the renegotiation literature. The related empirical literature has in common the study of large debt contracts of large companies and the testing of initial loan terms and changes in borrowers' financial health as potential drivers of the renegotiation process.

Roberts and Sufi (2009a) pioneered the empirical literature on debt renegotiation outside of bankruptcy situations, showing that over 90% of long-term private credit agreements in the US are renegotiated prior to their stated maturity, most outside default. In their study, new information regarding the borrower's credit quality, investment opportunities, and collateral, as well as macroeconomic fluctuations in credit and equity market conditions are found to be major determinants of renegotiation and its outcomes. Denis and Wang (2014) focus on covenant renegotiations. They find that, even in the absence of any covenant violation, debt covenants are frequently renegotiated. Changes in firm's financial statements' numbers, macroeconomic factors and lender leverage are reported as

significant attributes explaining covenants renegotiation. Roberts (2015) studies the timing of renegotiation and finds that this timing is driven by the contracting parties' financial health and uncertainty related to borrowers' credit quality. Godlewski (2015) also investigates the timing of renegotiations, reporting that initial loan terms, banking pool features, and the legal framework significantly impact the time gap between syndicated loan renegotiations. Freudenberg et al. (2017) investigate whether covenant violations in prior contracts influence renegotiation probability in subsequent new loans. They find that violating covenants in one debt contract results in tighter loan agreement terms for the borrower in the next one, increasing the scope for renegotiation. Nikolaev (2018) shows evidence that monitoring demand proxies and contractual monitoring mechanisms, like covenants, relate positively with renegotiation intensity. Godlewski (2019) examines the design of debt contracts after renegotiation and reports that the number of amendments increases with longer maturities and creditor-friendly environments and decreases with collateral and bank reputation. Dou (2020) finds that financial covenants are less likely to be renegotiated the higher is the debt-contracting value.

### **3 Materials and methods**

#### **3.1 Data profile**

The proprietary database used in this study, provided by a Brazilian bank, mainly comprises small loans to SME seeking to finance working capital or capital expenditures of an investment project. The sample comprises a total of 11,491 original loans with an average amount of \$ 64,000 granted to distinct firms with average assets of \$ 1.2 million, between January 2007 and December 2016. None of the contracts in the sample has any kind of *ex-ante* contingency (covenants, pricing grids, or borrowing bases). Most of the loans (74.6%) are unsecured in the sense that they do not include collateral. Those without collateral include a personal guarantee instead of collateral. If the borrower fails to repay the loan, the bank has the option of seizing the collateral or, in the case of loans with a personal guarantee only, registering the firm and individuals in national credit restriction databases. We did not have access to information on the loans taken at loss, but testimonies

provided by the bank's staff informed us that it is ~~part of~~ the institution's policy to renegotiate the loan in the event of default. This policy is in line with theoretical predictions and stylized facts showing that banks prefer to renegotiate loans rather than seizing assets or registering the borrower in credit restriction databases.

All loans in the sample were repaid without renegotiation or were renegotiated – prior or after stated maturity. The bank considers a loan to be renegotiated if it is replaced by a new debt contract with any change to one or more of the four main terms of the original agreement: i. interest rate spread; ii. guarantee (~~whether~~ collateral or personal guarantee); iii. loan amount; and/or iv. maturity. The database includes a flag informing whether the loan was renegotiated. It also includes information regarding the four main terms of the subsequent new loan, which allows us to discern between favorable and unfavorable renegotiation outcomes for borrowers. The bank labeled 9,960 (86.7%) of the loans as repaid without renegotiations, whereas 1,531 (13.3%) were labeled as renegotiated. Maturity is the most renegotiated item, being changed in 80% of the renegotiated loans, always extending the original stated maturity. The interest rate spread also changes frequently: 74% of the renegotiated loans had the spread changed, the majority (74%) increasing the original loan spread, while a smaller portion (26%) decreased it. Guarantees are changed in 44% of the contracts, with the majority (88%) increasing the initial collateral requirements. 35% of renegotiated loans increased the original loan amount. No renegotiated contract showed a reduction in the amount originally granted. Table 1 gives an overview of the main characteristics of the sample.

[Insert Table 1 near here]

The low proportion of renegotiated loans is in contrast with that found by Roberts and Sufi (2009a), who report that over 90% of private credit agreements between U.S. publicly traded firms and financial institutions are renegotiated prior to their stated maturity. A flag in the database informs that 37.4% of the contracts of the sample experienced some delay in the payment of installments or that the respective borrowers missed at least one debt payment during the term of the loan.

22.6% of the loans that registered any kind of delinquency were renegotiated. This percentage is almost three times higher than the 7.8% of renegotiated contracts found among loans that were timely repaid.

Taken together, these findings indicate that – differently from large corporate loans, which are frequently renegotiated outside of financial distress – delinquency is a major driver of renegotiation of small debt contracts. It is also in line with our rationale that, in the absence of *ex-ante* contingencies that encourage *ex-post* bank monitoring, the signal that things have gone wrong with the borrower is commonly limited to delinquency events. The percentage of renegotiated loans without delinquency (7.8%) suggests that either the bank noticed something wrong with the contract before maturity or the borrower took the initiative to renegotiate the loan. However, given that the incentive for bank monitoring is weaker in the case of small loans, we ~~postulate~~ suggest that the borrower’s bargaining power probably explains the renegotiation of these contracts, as exposed in our second hypothesis. The information regarding the new loan that subsequently replaced the renegotiated one allows us to distinguish between borrower favorable and unfavorable renegotiation outcomes, as explained in the next subsection. This distinction is necessary to test our third and fourth hypotheses, respectively.

### 3.2 Variables operationalization

As explained in the next subsection, we use three regressions to test the six hypotheses of this study. The first ~~one~~, used for estimating the relation between renegotiation likelihood and borrower’s delinquency (H1) and bargaining power (H2), uses *Reneg* as dependent variable, a binary indicator signaling loan renegotiation. The second regression, employed to test the third (H3) and fourth (H4) hypotheses, uses a dichotomous variable, *Favorable*, informing whether the loan was renegotiated under favorable conditions to the borrower. We label the renegotiation as favorable to the borrower in each of the situations listed in Table 2. The situations listed refer to the conditions of the renegotiated loan compared to the original one.

[Insert Table 2 near here]

We recognize that this classification is somewhat-subjective. For example, borrowers may bargain for an interest rate reduction in exchange for additional collateral. This outcome may be in his best interest and therefore this renegotiation could be labeled as borrower favorable. Nevertheless, we choose to remove as much ambiguity as possible from the analysis by adopting a conservative approach. As Table 2 shows, this classification results in 461 borrower-friendly outcomes, equivalent to 30.1% of renegotiations. Seven out of 15 possible borrower friendly outcomes are observed in the sample. The most common borrower-friendly outcome is one in which only the maturity of the original contract is extended upon renegotiation, while the spread, collateral requirements, and original loan amount remain unchanged. The less common borrower-friendly outcome is one in which the collateral requirements of the original contract are reduced, and the maturity and loan amount increase on renegotiation, while the spread remains unchanged.

The third regression, used to test the fifth (H5) and sixth (H6) hypotheses of this study, uses a discrete variable, *Nr\_Favorable*, ranging from 0 to 4, to establish the number of amendments made in favor of the borrower in the renegotiated loan.

Besides delinquency, captured by a dummy variable (*Delinquency*), informing whether the loan registered a delayed or missing payment before maturity or renegotiation, our main variable of interest is the borrower's bargaining power. We use three proxies for capturing a borrower's bargaining power: i. the natural logarithm of the firm's total assets (*Log Assets*); ii. the number of active loans on behalf of the borrower in the Brazilian financial system (*Outside options*); and iii. the length of the relationship between the borrower and the bank (*Relationship*). Assuming that the greater the size of the borrower's assets, the greater the loan amount, the bank's loss can be greater if larger firms threaten to default, which increases the bargaining power of these borrowers. Borrower size has been positively associated with its bargaining power in the financial contracting literature (Cenni et al. 2015; Uchida 2011). The number of active loans on behalf of the firm in the financial system is indicative of alternative sources of financing at its disposal. Theoretically, these outside options are crucial for a firm to credibly threaten to leave its current lender and thereby increase its bargaining power (Rajan 1992). Therefore, the more numerous the firm's financing alternatives, the

greater its bargaining power. A longer borrower-lender relationship, in turn, has been traditionally associated with reduced information asymmetry, especially in case of SME, that usually present more informational opacity (Grunert and Norden 2012; Petersen and Rajan 1994). It also means that the bank sees the borrower as a good client (otherwise the relationship would not last long), and the borrower may use this record to threaten to leave the bank if better conditions are not obtained through a renegotiation process.

The empirical literature on debt renegotiation has tested the initial terms of the contract as well as measures of the borrower's financial health as potential determinants of the probability and outcomes of renegotiation (e.g., Dou 2020; Nikolaev 2018; Roberts and Sufi 2009a). We use these two vectors as control variables. We also control for year and industry fixed effects. Finally, we test the interactions between *Delinquency* and *Log Assets*, and between *Delinquency* and *Relationship*. As the asset size of the borrower increases, the loan size may also increase, and the bank's incentive to monitor the borrower can increase as well. In addition, the length of the bank-borrower relationship can reduce asymmetric information, facilitating monitoring efforts by the bank. Given that the absence of *ex-ante* contingencies in SME loan contracts reduces the bank's incentive to monitor, these interactions can capture results similar to those observed in contracts where the presence of *ex-ante* contingencies is common. Table 3 displays a brief description of the computation of each variable.

[Insert Table 3 near here]

Table 4 provides summary statistics for the explanatory variables of the different samples used in this study. Panel A contains summary statistics for the explanatory variables considering the entire database, used to test our first two hypotheses (H1 and H2). The sample is divided between renegotiated and non-renegotiated contracts to provide a better perspective on the influence of variables on probability of renegotiation. One can see that the average firm with renegotiated loans has larger assets, a longer borrower-lender relationship, and a greater number of alternative financing sources than the average firm with non-renegotiated loans. It also incurs delinquency events more frequently. Interest spread, collateral

incidence, loan amount, and maturity are higher for firms with renegotiated loans than for firms with non-renegotiated loans. Panel B contains summary statistics for the explanatory variables considering the subsample of renegotiated loans, used to test hypotheses H3, H4, H5, and H6. This subsample is divided between borrower favorable outcomes and borrower “not favorable” outcomes<sup>3</sup>, according to the criteria used in the construction of the variable *Favorable* (see Table 2). One can see that the average firm that obtains favorable outcomes in a renegotiation has larger assets, a longer banking relationship, and a greater number of alternative financing sources than the average firm that does not obtain favorable terms. It also incurs less frequent delinquency events, which may be indicative that more frequent delinquencies reduce the firm’s bargaining power. Borrowers that obtained more favorable terms on renegotiation also have a lower interest spread and a higher loan amount in the original contract than borrowers that did not obtain the same advantageous outcome in a renegotiation.

[Insert Table 4 near here]

### 3.3 Econometric model

We use three equations to test our six hypotheses. We start by adopting a binary-choice regression model, formalizing the decision to renegotiate or not a loan agreement, as a function of covariates. Write this model as:

$$Reneg_i = \mathbf{1}(X_i\beta + u_i \geq 0), \quad (1)$$

where *Reneg* represents a binary variable equal to 1 if the loan was renegotiated and 0 otherwise, *X* denotes the vector of covariates, as described in Table 3,  $\beta$  represents an unknown parameter vector, *u* denotes an unobserved error term, and  $\mathbf{1}(\cdot)$  is an indicator function equal to 1(0) if the inner condition,  $X_i\beta + u_i \geq 0$ , is true (false). The observational index *i* refers to each individual loan contract. The error, *u*, is assumed to follow a normal conditional distribution, which yields a probit model for the conditional probability of renegotiation. Formally,

$$\Pr(Reneg_i = 1|X_i) = \Phi(X_i\beta), \quad (2)$$

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<sup>3</sup> We use this expression to refer to outcomes that cannot be labeled as favorable to borrowers, but which are not necessarily unfavorable either.



where  $\Phi(\cdot)$  denotes the standard normal distribution. Eq. (2) is used to test the first two hypotheses. To test the third hypothesis, we only change the dependent variable in Eq. (2):

$$\Pr(\text{Favorable}_i = 1|X_i) = \Phi(X_i\beta). \quad (3)$$

To test of the fourth hypothesis, we use a discrete dependent variable. In this case, we are led to a multivariate probit. Formally,

$$\Pr(Nr \text{ Favorable}_i = y_i|X_i) = \Phi(X_i\beta), \quad (4)$$

where  $y_i$  varies from 0 to 4.

#### 4 Results and discussion

We begin by examining the factors that influence the probability of renegotiation in the database provided by the bank. We computed a correlation matrix (Table 5) to alleviate concerns related to multicollinearity issues. The variables *Log Sales* and *EBITDA/Assets* were excluded from the specifications tested due to their high correlation with *Log Assets* (0.83) and *ROA* (0.79), respectively. The correlation matrix also suggests caution in using *Log Assets* and *Log Amount* in the same specification of the model to be estimated, as these two variables have a correlation coefficient of 0.75. Considering that *Log Assets* is one of our variables of interest, as well as the importance of *Log Amount* as one of the main contractual terms, we choose to present alternative estimation results in which both variables are **used**, but not in the same model specification.

[Insert Table 5 near here]

Table 6 presents the results of the probit model that tests the influence of some attributes on the probability of renegotiation of small loans for SMEs. We considered six model specifications, starting with the most parsimonious one, in which only our four variables of interest are used as explanatory variables. Next, we added the control variables: firstly, the four main contractual terms; secondly, the remaining controls, which include variables that capture the perspective of the financed firm' financial health prior to the granting of the loan, as well as controls for industry and year fixed effects. Finally, we included the interaction terms.

[Insert Table 6 near here]

The results support our first two hypotheses, H1 and H2. The positive and statistically significant coefficient of *Delinquency* shows that the likelihood of renegotiating a small debt contract increases if the borrower delays or misses any debt payment. The variable remains significant across all five model specifications. The average marginal effect of *Delinquency* suggests that, on average, the probability of renegotiation increases by 11% if the borrower incurs a delinquent event, when considering all controls. This makes *Delinquency* the most important attribute of the estimated model to explain renegotiation of small debt contracts. This result is in line with theoretical predictions that point to the non-payment of debt as a major reason of the shift of contractual control to the lender (Hart and Moore 1998). It also corroborates the prediction that, in the face of default, the creditor prefers to renegotiate the loan instead of seizing assets (Huberman and Kahn 1988a). The positive and statistically significant coefficients of *Log Assets*, *Relationship*, and *Outside options*, in turn, support our second hypothesis that the borrower's bargaining power relates positively to the probability of renegotiation of small debt contracts. In this sense, they confirm theoretical predictions that reclaim the bargaining power of the parties as a major driver of financial contracts renegotiation (Berger and Udell 1990; Moraux and Silaghi 2014). This evidence does not change across the six model specifications. Taken together, these three variables indicate that larger firms, firms with longer banking relationships, and firms with a larger number of financing alternatives – that is, firms with greater bargaining power – renegotiate small loan contracts more frequently than their peers with less bargaining power. The average marginal effect of *Log Assets* indicates that every additional 10% of a firm's assets increases the probability of renegotiation by 0.21%, when all other attributes are controlled for. On average, every additional year of bank-borrower relationship increases the renegotiation probability by 0.4%, and every external financing option augments the same probability by 0.7%. To the best of our knowledge, only *Log Assets* among those three variables had been previously tested by the empirical literature on renegotiation. Dou (2020) finds a negative relationship between the natural logarithm of the firm's assets and the probability of covenants renegotiation. Nikolaev (2018) finds that the natural

logarithm of the firm's assets relate positively to the number of debt renegotiations in any given firm-year. Roberts and Sufi (2009a) do not find any explanatory power of this variable on the probability of renegotiation, but they find that changes in a firm's assets have a slightly significant power to explain the occurrence of renegotiation.

In addition to delinquency events and a firm's bargaining power, the control variables used also contribute to explain the probability of renegotiation of small debt contracts. Except for collateral, all the other three main contractual terms show positive and statistically significant coefficients. In general, those covariates that aim to capture the firm's financial health before signing the contract also impact the likelihood of renegotiation in the sense that firms with better financial perspectives (lower book leverage, larger liquidity, fewer restrictions, and greater credit score assigned by the bank, for example) show lower probability of renegotiating their loans. The importance of the initial debt contract design and *ex-ante* financial figures of the firm to explain the probability of *ex-post* renegotiation of debt contracts had already been found by previous studies (e.g., Dou 2020; Godlewski 2019; Nikolaev 2018; Roberts 2015).

In the sixth specification, the interaction term *Delinquency x Log Assets* shows a negative and statistically significant coefficient. This suggests that the larger and/or more delinquent the borrower, the lower the probability of renegotiation. This result indicates that delinquency does not lead to an increase in the probability of renegotiation for larger borrowers. One possible explanation for this finding is that larger borrowers may miss a payment only temporarily – if the renegotiation takes place for these borrowers, it is likely to be on the borrower's initiative. The interaction term *Delinquency x Relationship*, in turn, did not show any statistical significance.

One might ask whether the above results change significantly if we consider only loan renegotiations of borrowers in financial distress (bank-initiated renegotiations). These renegotiations are essentially different from renegotiations prompted by the borrower's bargaining power in the face of improvements in its financial situation. For the renegotiations motivated by the borrower's financial distress alone, the variable *Delinquency* could gain importance in relation to the borrower's bargaining power in explaining the probability of renegotiation. Our

data sample lacks information on who took the initiative in the renegotiation process – whether the bank or the borrower. Therefore, we are unable to accurately distinguish between the two types of renegotiations. However, based on the classification outlined in Table 2, 461 renegotiations were labeled as borrower-favorable and removed. The remaining sample included only renegotiations probably initiated by the bank and motivated by the borrower’s financial distress, as the result was not favorable to the borrower. Then, the same probit model specifications of Table 6 were estimated. Table 7 presents the results. As expected, the variable related to renegotiations allegedly initiated by the bank gains importance, while the proxies related to the borrower’s bargaining power have their contributions reduced in this sample. Compared to the results of Table 6, one can see that *Relationship* loses statistical significance in four of the six specifications tested, whereas *Log Assets* loses significance in one of the tested models. One other point to be noted is that the coefficient of *Delinquency* increases in five model specifications, while the coefficient of the proxies for the borrower’s bargaining power is reduced.

[Insert Table 7 near here]

To triangulate the evidence on the link between renegotiation of small debt contracts and the contracting parties’ bargaining power, we proceeded to further analysis of the outcomes of the renegotiation process. In this analysis, we only deal with the subsample of the 1,531 renegotiated loans. Based on the classification outlined in Table 2, we labeled 461 of the renegotiation outcomes as borrower favorable. In addition, we counted the number of changes in the four main contractual terms of the loan – that is, interest spread, collateral requirements, ~~the~~ stated maturity and loan amount – that were made in a manner favorable to the borrower. By favorable to the borrower, we mean any of the following possibilities: i. a decrease in interest spread decrease; ii. a decrease in collateral requirement; iii. an increase in stated maturity; and iv. an increase in loan amount. This means that a renegotiated loan with increased spread, reduced collateral requirements, increased maturity, and no change to the original amount would result in two favorable outcomes for the borrower. The same variables that could cause

multicollinearity concerns in the entire dataset also presented the same correlation issues in the subsample (see Table 8) and were kept aside.

[Insert Table 8 near here]

The test of the hypotheses H3-H6 of this study revolves around the idea that the result of the renegotiation game in small debt contracts is the result of the clash between the bargaining powers of the contracting parties. Theoretically, this applies not only to small loans, but to all types of contracts. However, in this study we claim that, in the absence of *ex-ante* contingencies like covenants and the like, delinquency events are a major determinant of the shift control towards the lender, and, ultimately, what determines the bank's bargaining power when renegotiating a small loan. Table 9 presents the results of two approaches trying to link bargaining powers to renegotiation of small debt contracts. Before performing the estimations, we checked the correlation matrix of the explanatory variables in the subsample. Panel A presents the results of a probit estimation, in which the bivariate dependent variable, *Favorable*, informs whether the outcome of the renegotiation was borrower-friendly or not, following the concept outlined in the previous Section. Panel B presents the results of an ordered probit estimation, in which the multivariate dependent variable, *Nr Favorable*, informs the number of main contractual terms renegotiated in a borrower-friendly way, ranging from 0 to 4.

[Insert Table 9 near here]

In both panels, the coefficients of our variables of interest offer support to hypotheses H3, H4, H5, and H6. One can see that *Delinquency*, *Log Assets*, *Relationship*, and *Outside options* remain statistically significant across all model specifications. In Panel A, all control variables are not statistically significant, except for model (2), in which *Log Amount* takes the place of *Log Assets* and shows some significance. However, this may be explained by the absence of *Log Assets* in the model, and by the capture of the effect of *Log Assets* by *Log Amount* through the correlation between the two variables. Unlike the first estimation, in which both the initial contractual design and the firm's financial health perspective seemed to

explain the likelihood of renegotiation, the parties' bargaining power seems to be the only attribute that determines whether the renegotiation outcome will be borrower-friendly or not. *Delinquency*, which had a positive sign in the previous estimate, relating positively to the renegotiation likelihood, changes its sign in the new estimations, suggesting that any delay or missed debt payment strengthens the bank's bargaining power in the renegotiation game. A negative relationship between this variable and *Favorable* indicates that the bank takes advantage of delinquent events to reduce the likelihood of borrower-friendly outcomes in the renegotiation process. A negative relationship between *Delinquency* and *Nr Favorable* suggests that, in the event of delinquency, not only is the probability of borrower-friendly outcomes reduced, but also the bank tends to make fewer concessions to the borrower. Table 10 provides an additional illustration of this argument. One can see that even in the outcomes labeled as borrower-friendly the bank asserts its bargaining power in loan renegotiations in which borrower delinquency events were observed, reducing the number of key contractual terms changed in favor of the borrower. The average number of key contractual terms renegotiated in a borrower-friendly way is higher in the absence of delinquency events, in which case the bank's bargaining power is possibly lower.

[Insert Table 10 near here]

The positive and statistically significant sign of *Log Assets*, *Relationship*, and *Outside options* in both panels, in turn, suggests that the borrower's bargaining power is opposed to that of the bank, forcing a greater number of concessions from the latter (Panel A), and more frequently (Panel A). Those with larger assets, longer banking relationships, and more external financing alternatives not only more often obtain a favorable outcome, but they also obtain a greater number of terms renegotiated in their favor. However, it can be noted that, from an economic perspective, the average partial effect of *Delinquency* on the renegotiation outcomes seems to outweigh the average partial effects of borrower's bargaining powers, even if considering the sum of the effects of the three proxies used to capture the borrower's bargaining power. This may be indicative of the fact that, regardless of

the borrower's bargaining power, the bank's prevails, at least in cases of delinquency events.<sup>4</sup>

The statistically significant sign of the coefficients of the variables *Delinquency*, *Log Assets*, *Relationship*, and *Outside options* support our hypotheses H3, H4, H5, and H6. It also confirms theoretical predictions that point out the bargaining power of the contracting parties as one of the main attributes that determine the renegotiation outcomes (e.g., Aghion et al. 1994; Hart and Moore 1988, 1998; Huberman and Kahn 1988a; Rajan 1992; Rajan and Winton 1995). They are also in line with previous studies that address the parties' bargaining power only tangentially. For example, Godlewski (2019) argue that the greater the bargaining power of the bank in relation to the borrower, the fewer the number of amendments made in a loan renegotiation. The author finds a positive sign for maturity, claiming that the longer the maturity, the smaller the information asymmetries and, therefore, the greater the borrower's bargaining power. Although we did not find explanatory power of maturity for renegotiation outcomes, our results provide additional evidence to the importance attributed by the author to the bargaining power of the contracting parties.

## 5 Concluding remarks

The literature on financial contracting that deals with renegotiation of debt contracts has grown substantially in recent years. This study aims at enriching this literature by examining the role of contracting parties' bargaining power in the renegotiation process of small debt contracts. Previous studies have analyzed the renegotiation of large loans to publicly listed companies, where *ex-ante* contingencies, like covenants, allocate control rights in a state-contingent way, making renegotiation of these kind of loans much more common in contexts outside of financial distress. A distinctive feature of the present study is that we use a novel sample of debt contracts, composed of small loans that do not include *ex-ante* contingencies in their design. We hypothesize, and provide evidence that, in the absence of such contingencies, a major – and possibly single – driver of shift of

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<sup>4</sup> It should be borne in mind that it may be in the bank's interest to make concessions to the borrower even in a situation where the bank's bargaining power is absolute, in order to increase the prospect of recovering the funds granted.

control towards the creditor is a delinquency event, that is, a delayed or missed debt payment by the borrower. In this case, the bank's bargaining power is increased, and the outcome of the renegotiation tends to be less favorable to the borrower than in the absence of delinquency events. We also argue, and provide evidence, that the borrower's bargaining power plays a significant role in explaining the probability and the outcome of renegotiation of small debt contracts.

We find that, in fact, the probability of renegotiation of small loans is much lower than that observed in the context of large debt agreements. We claim that this is explained by: i. the lack of *ex-ante* contingencies, which reduces the bank's control and bargaining power outside of financial distress; and ii. the lower bargaining power of SMEs, as compared to large public companies. We use three proxies for capturing the borrower's bargaining power: Their total assets, the length of bank-borrower relationship, and the number of financing alternatives available to the borrower. We confirm the relevance of these proxies and borrower delinquency in order to explain the process of renegotiating these small debt contracts through three regressions. In the first one, we deal with the likelihood of renegotiation. We find that delinquent firms and firms with larger assets, lengthier bank-borrower relationships, and more financing alternatives are more likely to renegotiate their small loans. To confirm the hypothesis that the bargaining power of contracting parties governs the entire process of renegotiating small debt contracts, we also investigate the outcomes of renegotiation. We find that borrower delinquency events reduce the probability that the renegotiation will end up in a borrower-friendly way, while firms with higher bargaining power increase this likelihood. Delinquency events also reduce the number of key contract terms (interest spread, collateral requirements, maturity, and loan amount) renegotiated in a favorable way for the borrower, while the greater the firm's bargaining power, the greater the number of key terms renegotiated in a borrower-friendly way.

These findings are consistent with theoretical predictions regarding the governing role of contracting parties' bargaining power on the renegotiation process. This is a distinctive contribution of this study to the financial contracting literature. To the best of our knowledge, the related empirical literature has not yet properly tested parties' bargaining power proxies when investigating the determinants of the renegotiation of debt contracts.



## 6 Statements and declarations:

**Competing interests:** The authors have no competing interests to declare that are relevant to the content of this article.

**Funding:** This work was supported by the *FCT - Fundação para a Ciência e a Tecnologia, I.P.*, Projects PTDC/EGE-OGE/31246/2017 and UIDB/05037/2020.

### **Author contributions:**

José Valente: Conceptualization; formal analysis and investigation; writing – original draft and preparation.

Mário Augusto: Conceptualization; writing – review and editing; supervision.

José Murteira: Methodology; writing – review and editing.

**Data availability statement:** The data that support the findings of this study are available from the corresponding author upon request.

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## Tables

**Table 1**  
**Main sample characteristics**

<b>Panel A: Full sample features</b>					
Total loans in the sample					11,491
Renegotiated loans (%)					13.3%
Loans with <i>ex-ante</i> contingencies (%)					0%
Secured loans (%)					25.4%
Delinquent loans (%)					37.4%
Renegotiated (%)					22.6%
Timely repaid loans					62.6%
Renegotiated (%)					7.8%
<b>Panel B: Renegotiated loans outcomes</b>					
Loan performance	Change type	Spread	Collateral	Maturity	Amount
Delinquent loans	Increase	651	394	701	127
	Decrease	88	34	0	0
Non-delinquent loans	Increase	193	208	523	410
	Decrease	207	45	0	0
Total		1,139	681	1,224	537

Note: Panel A displays the main features of the full sample. Panel B gives an overview of the outcomes for the 1,531 loans renegotiated. Increase or decrease in the four main contractual terms compared with the original agreement. Delinquent loans are loans that had any delay or lack of payment after contract inception.

**Table 2**  
**Possible outcomes of borrower favorable renegotiations**

Interest spread	Collateral	Maturity	Amount	Number of observations
Decreases	Unchanged	Unchanged	Unchanged	0
Decreases	Unchanged	Unchanged	Increases	0
Decreases	Unchanged	Increases	Unchanged	62
Decreases	Unchanged	Increases	Increases	109
Decreases	Decreases	Unchanged	Unchanged	0
Decreases	Decreases	Unchanged	Increases	0
Decreases	Decreases	Increases	Unchanged	0
Decreases	Decreases	Increases	Increases	26
Unchanged	Unchanged	Unchanged	Increases	0
Unchanged	Unchanged	Increases	Unchanged	177
Unchanged	Unchanged	Increases	Increases	80
Unchanged	Decreases	Unchanged	Unchanged	0
Unchanged	Decreases	Unchanged	Increases	0
Unchanged	Decreases	Increases	Unchanged	5
Unchanged	Decreases	Increases	Increases	2
Total				461

**Table 3**  
**Variables operationalization**

Variable	Computation
Dependent variables	
<i>Reneg</i>	= 1, if the loan was renegotiated, 0 otherwise
<i>Favorable</i>	= 1, if the loan was renegotiated on terms favorable to the borrower, 0 otherwise
<i>Nr Favorable</i>	Number of contract terms renegotiated favorably to the borrower, ranging from 0 to 4.
Variables of interest	
<i>Delinquency</i>	= 1, if the firm registered any delayed or missed payment before maturity or renegotiation, 0 otherwise
<i>Log Assets</i>	Natural logarithm of total assets
<i>Relationship</i>	Number of months of borrower-lender relationship
<i>Outside options</i>	Number of active loans with other banks
Control variables	
<i>Spread</i>	Loan interest rate – Brazilian market interest rate
<i>Collateral</i>	= 1, if the loan has collateral attached, 0 otherwise
<i>Maturity</i>	Number of months between loan inception and stated maturity date
<i>Log Amount</i>	Natural logarithm of loan amount
<i>Log Sales</i>	Natural logarithm of total sales
<i>Book leverage</i>	Total debt/Total assets
<i>Liquidity</i>	Cash and equivalents/Total assets
<i>EBITDA/Assets</i>	Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA)/Total assets
<i>Debt/EBITDA</i>	Debt/EBITDA
<i>ROA</i>	Net income/Total assets
<i>Score</i>	Firm's credit score attributed by the bank
<i>Restriction</i>	= 1 if the bank registered any restrictions in relation to the firm, 0 otherwise
<i>Loss</i>	= 1 if the firm reported a negative profit in the year prior to the loan, 0 otherwise
<i>Delinquency x Log Assets</i>	Interaction between <i>Delinquency</i> and <i>Log Assets</i>
<i>Delinquency x Relationship</i>	Interaction between <i>Delinquency</i> and <i>Relationship</i>

Note: *Relationship*, *Outside options*, *Score*, and *Restriction* were measured at the contracting date. All other variables, with the obvious exceptions of *Reneg*, *Delinquency*, contract terms, and post-renegotiation variables, were measured at the end of the year prior to loan inception.

**Table 4**  
**Summary Statistics**

<b>Panel A</b>						
<b>Variable</b>	<b>Renegotiated</b>			<b>Non-renegotiated</b>		
	<b>Mean</b>	<b>Std. Dev.</b>	<b>Median</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Median</b>
<i>Delinquency</i>	0.63	0.48	1	0.33	0.47	0
<i>Assets (\$ Mil)</i>	1.93	1.94	1.00	1.08	1.29	0.50
<i>Relationship</i>	10.91	6.46	10.00	8.93	5.78	7.87
<i>Outside options</i>	16.92	6.50	18.00	13.10	8.19	13.00
<i>Spread (bps)</i>	13.02	6.16	11.67	11.23	5.84	10.14
<i>Collateral</i>	0.29	0.46	0	0.25	0.43	0
<i>Maturity (months)</i>	26.78	10.12	24.30	20.22	8.06	24.13
<i>Log Amount (\$ Thousand)</i>	115.50	360.13	25.00	56.07	195.31	15.00
<i>Log Sales (\$ Mil)</i>	1.77	1.37	1.26	1.55	1.28	1.07
<i>Book leverage</i>	0.55	0.30	0.54	0.50	0.28	0.49
<i>Liquidity</i>	0.14	0.17	0.09	0.16	0.19	0.09
<i>EBITDA/Assets</i>	0.29	0.54	0.17	0.25	0.36	0.18
<i>Debt/EBITDA</i>	13.76	133.13	5.19	7.01	68.19	3.61
<i>ROA</i>	0.24	0.52	0.13	0.21	0.47	0.14
<i>Score</i>	9.33	0.83	9.56	9.20	0.72	9.23
<i>Restriction</i>	0.83	0.37	1	0.61	0.49	1
<i>Loss</i>	0.07	0.26	0	0.07	0.26	0

  

<b>Panel B</b>						
<b>Variable</b>	<b>Borrower favorable</b>			<b>Borrower not favorable</b>		
	<b>Mean</b>	<b>Std. Dev.</b>	<b>Median</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Median</b>
<i>Delinquency</i>	0.46	0.50	0	0.71	0.45	1
<i>Assets (\$ Mil)</i>	2.72	2.01	2.45	1.59	1.81	0.65
<i>Relationship</i>	13.20	6.73	12.08	9.92	6.09	8.99
<i>Outside options</i>	19.43	6.65	20.00	15.83	6.13	16.00
<i>Spread (bps)</i>	12.26	5.20	11.14	13.34	6.51	11.80
<i>Collateral</i>	0.34	0.47	0	0.27	0.45	0
<i>Maturity (months)</i>	27.06	11.69	24.30	26.66	9.37	24.30
<i>Log Amount (\$ Thousands)</i>	163.17	431.69	47.50	94.96	322.53	18.47
<i>Log Sales (\$ Mil)</i>	2.28	1.29	2.78	1.54	1.35	0.89
<i>Book leverage</i>	0.59	0.27	0.57	0.54	0.30	0.53
<i>Liquidity</i>	0.12	0.14	0.08	0.15	0.18	0.09
<i>EBITDA/Assets</i>	0.21	0.25	0.15	0.32	0.62	0.19
<i>Debt/EBITDA</i>	20.96	198.73	6.69	10.65	91.33	4.48
<i>ROA</i>	0.17	0.25	0.10	0.28	0.59	0.15
<i>Score</i>	9.30	0.69	9.36	9.35	0.88	9.65
<i>Restriction</i>	0.84	0.37	1	0.83	0.37	1
<i>Loss</i>	0.07	0.26	0	0.07	0.26	0

Note: summary statistics for the explanatory variables of the different samples used in this study. Panel A contains summary statistics for the explanatory variables considering the entire database, divided into renegotiated and non-renegotiated loans. Panel B contains summary statistics for the explanatory variables considering the subsample of renegotiated loans, divided into borrower favorable and borrower not favorable outcomes. Check Table 3 for description of variables.



**Table 5**  
**Correlation matrix**

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Delinquency (1)	1.00								
Log Assets (2)	0.01	1.00							
Relationship (3)	0.01	0.69	1.00						
Outside options (4)	0.03	0.28	0.21	1.00					
Spread (5)	0.04	-0.25	-0.17	-0.06	1.00				
Collateral (6)	0.01	0.32	0.22	0.08	-0.08	1.00			
Maturity (7)	0.06	-0.03	-0.01	0.03	0.10	-0.01	1.00		
Log Amount (8)	0.01	0.75	0.55	0.21	-0.40	0.37	0.10	1.00	
Log Sales (9)	-0.01	0.83	0.55	0.24	-0.25	0.32	-0.06	0.70	1.00
Book leverage (10)	0.01	0.29	0.21	0.10	-0.09	0.16	-0.00	0.29	0.31
Liquidity (11)	-0.02	-0.20	-0.14	-0.04	0.04	-0.11	-0.02	-0.14	-0.14
EBITDA/Assets (12)	0.01	-0.29	-0.20	-0.08	0.06	-0.09	0.05	-0.21	-0.19
Debt/EBITDA (13)	-0.01	0.05	0.03	0.03	-0.01	0.03	0.03	0.06	0.03
ROA (14)	0.01	-0.21	-0.16	-0.06	0.05	-0.07	0.03	-0.16	-0.15
Score (15)	0.02	-0.06	-0.07	0.00	-0.12	-0.09	0.10	-0.07	-0.01
Restriction (16)	0.04	0.12	0.09	0.04	0.01	-0.02	0.09	0.03	0.09
Loss (17)	-0.00	0.04	0.04	0.01	-0.00	-0.00	0.02	0.07	-0.02
Variable	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	
Book leverage (10)	1.00								
Liquidity (11)	-0.11	1.00							
EBITDA/Assets (12)	-0.27	0.09	1.00						
Debt/EBITDA (13)	0.05	-0.02	-0.04	1.00					
ROA (14)	-0.24	0.06	0.79	-0.02	1.00				
Score (15)	-0.07	0.07	0.05	-0.01	0.04	1.00			
Restriction (16)	0.02	-0.04	-0.01	0.01	-0.01	0.22	1.00		
Loss (17)	0.25	-0.02	-0.23	-0.02	-0.20	-0.06	-0.00	1.00	

Note: correlation matrix of the explanatory variables considering the entire database (11,491 observations)

**Table 6**  
**Determinants of renegotiation**

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Delinquency	13.682*** (0.709)	12.147*** (0.694)	12.131*** (0.698)	10.974*** (0.694)	10.990*** (0.698)	33.544*** (2.132)
Log Assets	1.510*** (0.078)		2.309*** (0.133)		2.124*** (0.135)	2.948*** (0.187)
Relationship	0.170*** (0.009)	0.377*** (0.022)	0.132** (0.008)	0.294*** (0.019)	0.138** (0.009)	0.138* (0.009)
Outside options	0.579*** (0.030)	0.587*** (0.034)	0.525*** (0.030)	0.518*** (0.033)	0.476*** (0.030)	0.475*** (0.030)
Spread		0.562*** (0.032)	0.570*** (0.033)	0.676*** (0.043)	0.654*** (0.042)	0.657*** (0.042)
Collateral		-0.048 (-0.003)	-0.601 (-0.035)	-0.347 (-0.022)	-0.399 (-0.025)	-0.369 (-0.023)
Maturity		0.782*** (0.045)	0.803*** (0.046)	0.693*** (0.044)	0.722*** (0.046)	0.721*** (0.046)
Log Amount		0.682*** (0.039)		0.962*** (0.061)		
Book leverage				4.751*** (0.300)	4.191*** (0.266)	4.136*** (0.263)
Liquidity				-3.323** (-0.210)	-2.747* (-0.174)	-2.703* (-0.172)
Debt/EBITDA				0.000 (0.000)	0.004 (0.000)	0.004 (0.000)
ROA				4.340*** (0.274)	5.142*** (0.327)	5.225*** (0.332)
Score				-1.098*** (-0.069)	-1.223*** (-0.078)	-1.225*** (-0.078)
Restriction				5.884*** (0.372)	5.389*** (0.342)	5.393*** (0.343)
Loss				-1.451 (-0.092)	-1.073 (-0.068)	-1.097 (-0.070)
Delinquency x Log Assets						-1.478*** (-0.094)
Delinquency x Relationship						-0.006 (-0.000)
Industry fixed effects				Yes	Yes	Yes
Year fixed effects				Yes	Yes	Yes

The sample consists of 11,491 private credit agreements between a bank and distinct SMEs during the period 2007-2016, of which 1,531 were renegotiated. The table presents marginal effects and estimated coefficients (in parenthesis) from a bivariate regression of whether or not renegotiation occurs. Average marginal effects are expressed as a percentage. Industry fixed effects correspond to four possible classifications: Manufacture, construction, commerce, and services. Robust estimator of variance used. Statistical significance at the 1%, 5%, and 10% levels is denoted by \*\*\*, \*\*, and \*, respectively. Diagnostic tests for specification (6): Wald chi<sup>2</sup>: 1,671.68; p-value: .000; Pseudo R<sup>2</sup>: .272. Check Table 3 for variable definitions.

**Table 7**  
**Determinants of renegotiation**

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Delinquency	12.691*** (0.817)	11.553*** (0.818)	11.538*** (0.820)	10.571*** (0.826)	10.581*** (0.827)	17.090** (1.337)
Log Assets	0.359 (0.023)		0.995*** (0.071)		1.021*** (0.080)	1.334*** (0.104)
Relationship	0.064 (0.004)	0.154*** (0.011)	0.039 (0.003)	0.109** (0.009)	0.044 (0.003)	-0.059 (-0.005)
Outside options	0.356*** (0.023)	0.352*** (0.025)	0.326*** (0.023)	0.310*** (0.024)	0.293*** (0.023)	0.293*** (0.023)
Spread		0.409*** (0.029)	0.414*** (0.029)	0.504*** (0.039)	0.482*** (0.038)	0.482*** (0.038)
Collateral		0.243 (0.017)	-0.052 (-0.004)	0.010 (0.001)	0.087 (0.007)	0.099 (0.008)
Maturity		0.650*** (0.046)	0.658*** (0.047)	0.585*** (0.046)	0.604*** (0.047)	0.604*** (0.047)
Log Amount		0.256 (0.018)		0.612*** (0.048)		
Book leverage				3.463*** (0.271)	3.282*** (0.257)	3.286*** (0.257)
Liquidity				-1.598 (-0.125)	-1.336 (-0.104)	-1.302 (-0.102)
Debt/EBITDA				0.004 (0.000)	0.004 (0.000)	0.004 (0.000)
ROA				3.550*** (0.277)	3.892*** (0.304)	3.902*** (0.305)
Score				-0.931*** (-0.073)	-0.997*** (-0.078)	- (-0.077)
Restriction				4.453*** (0.348)	4.220*** (0.330)	4.228*** (0.331)
Loss				-0.611 (-0.048)	-0.402 (-0.031)	-0.391 (-0.031)
Delinquency x Log Assets						-0.545 (-0.043)
Delinquency x Relationship						0.178 (0.014)
Industry fixed effects				Yes	Yes	Yes
Year fixed effects				Yes	Yes	Yes

The sample consists of 11,030 private credit agreements between a bank and distinct SMEs during the period 2007-2016, of which 1,070 were renegotiated (461 renegotiations deemed borrower-favorable were excluded from this sample). The table presents marginal effects and estimated coefficients (in parenthesis) from a bivariate regression of whether or not renegotiation occurs. Average marginal effects are expressed as a percentage. Industry fixed effects correspond to four possible classifications: Manufacture, construction, commerce, and services. Robust estimator of variance used. Statistical significance at the 1%, 5%, and 10% levels is denoted by \*\*\*, \*\*, and \*, respectively. Diagnostic tests for specification (6): Wald chi<sup>2</sup>: 1,631.77; p-value: .000; Pseudo R<sup>2</sup>: .274. Check Table 3 for variable definitions.

**Table 8**  
**Correlation matrix**

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Delinquency (1)	1.00								
Log Assets (2)	-0.13	1.00							
Relationship (3)	-0.10	0.69	1.00						
Outside options (4)	-0.21	0.52	0.39	1.00					
Spread (5)	0.05	-0.28	-0.18	-0.15	1.00				
Collateral (6)	-0.02	0.29	0.21	0.13	-0.13	1.00			
Maturity (7)	0.03	0.05	0.08	0.01	-0.02	0.06	1.00		
Log Amount (8)	-0.08	0.74	0.55	0.37	-0.40	0.41	0.30	1.00	
Log Sales (9)	-0.12	0.91	0.63	0.48	-0.28	0.30	0.05	0.74	1.00
Book leverage (10)	-0.03	0.34	0.25	0.19	-0.10	0.11	0.04	0.28	0.38
Liquidity (11)	0.02	-0.22	-0.12	-0.10	0.15	-0.12	0.00	-0.22	-0.21
EBITDA/Assets (12)	0.03	-0.39	-0.25	-0.20	0.08	-0.10	-0.00	-0.22	-0.29
Debt/EBITDA (13)	-0.03	0.09	0.05	0.05	0.02	0.06	0.05	0.13	0.08
ROA (14)	0.04	-0.39	-0.25	-0.21	0.08	-0.10	0.01	-0.22	-0.30
Score (15)	-0.00	-0.12	-0.11	-0.06	-0.11	-0.07	0.07	-0.16	-0.08
Restriction (16)	0.00	0.02	-0.00	-0.00	0.02	-0.03	-0.12	-0.11	-0.03
Loss (17)	-0.04	0.07	0.06	0.05	0.06	0.01	0.07	0.08	0.07
Variable	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	
Book leverage (10)	1.00								
Liquidity (11)	-0.08	1.00							
EBITDA/Assets (12)	-0.26	0.09	1.00						
Debt/EBITDA (13)	0.06	-0.03	-0.04	1.00					
ROA (14)	-0.28	0.11	0.97	-0.03	1.00				
Score (15)	-0.07	0.08	0.08	-0.06	0.09	1.00			
Restriction (16)	0.02	0.04	-0.01	-0.01	-0.01	0.10	1.00		
Loss (17)	0.30	0.03	-0.16	0.01	-0.17	-0.07	0.05	1.00	

Note: correlation matrix of the explanatory variables considering the subsample of renegotiated loans only (1,531 observations)

**Table 9**  
**Determinants of renegotiation outcomes**

<b>PANEL A: Renegotiation outcome favorable or not favorable to the borrower</b>					
Variable	(1)	(2)	(3)	(4)	(5)
Delinquency	-16.072*** (-0.520)	-16.428*** (-0.527)	-16.096*** (-0.521)	-16.501*** (-0.533)	-16.216*** (-0.527)
Log Assets	4.807*** (0.156)		4.868*** (0.158)		4.837*** (0.157)
Relationship	0.409* (0.013)	0.803*** (0.026)	0.403* (0.013)	0.768*** (0.025)	0.425* (0.014)
Outside options	0.706*** (0.023)	0.957*** (0.031)	0.709*** (0.023)	0.922*** (0.030)	0.724*** (0.024) *
Spread		-0.030 (-0.001)	-0.004 (-0.000)	0.029 (0.001)	0.049 (0.002)
Collateral		-0.763 (-0.024)	-0.894 (-0.029)	-0.872 (-0.028)	-0.997 (-0.032)
Maturity		-0.020 (-0.001)	0.054 (0.002)	0.013 (0.000)	0.037 (0.001)
Log Amount		1.764* (0.057)		1.431 (0.046)	
Book leverage				-0.311 (-0.010)	-2.463 (-0.080)
Liquidity				-7.041 (-0.227)	-5.659 (-0.184)
Debt/EBITDA				0.002 (0.000)	0.002 (0.000)
ROA				-3.336 (-0.108)	-0.698 (-0.023)
Score				0.432 (0.014)	0.128 (0.004)
Restriction				2.828 (0.091)	1.228 (0.040)
Loss				-4.963 (-0.160)	-4.213 (-0.137)
Industry fixed effects				Yes	Yes
Year fixed effects				Yes	Yes
<b>PANEL B: Number of items favorable to the borrower</b>					
Variable	(1)	(2)	(3)	(4)	(5)
Delinquency	-15.204*** (-1.883)	-16.014*** (-1.894)	-15.385*** (-1.901)	-16.008*** (-1.913)	-15.456*** (-1.921)
Log Assets	1.916*** (0.237)		1.690*** (0.210)		1.611*** (0.200)
Relationship	0.770*** (0.095)	0.929*** (0.110)	0.773*** (0.095)	0.933*** (0.112)	0.793*** (0.099)
Outside options	0.821*** (0.102)	0.935*** (0.111)	0.831*** (0.103)	0.928*** (0.111)	0.842*** (0.105)
Spread		-0.042 (-0.005)	-0.058 (-0.007)	-0.052 (-0.621)	-0.064 (-0.008)
Collateral		1.763*** (0.209)	1.897*** (0.234)	1.668*** (0.199)	1.690*** (0.210)
Maturity		-0.012 (-0.001)	0.028 (0.003)	-0.009 (-0.001)	0.012 (0.001)
Log Amount		0.922*** (0.109)		0.699*** (0.083)	
Book leverage				-0.005 (-0.001)	-0.558 (-0.069)
Liquidity				-5.401*** (-0.645)	-4.864*** (-0.605)

Debt/EBITDA	0.006***	0.005***
	(0.001)	(0.001)
ROA	-0.638	0.106
	(-0.076)	(0.013)
Score	-0.370	-0.534
	(-0.044)	(-0.066)
Restriction	0.446	-0.143
	(0.053)	(-0.018)
Loss	0.145	0.385
	(0.017)	(0.048)
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes

The subsample consists of 1,531 renegotiated private credit agreements between a bank and distinct SMEs during the period 2007-2016. Panel A presents marginal effects and estimated coefficients (in parenthesis) from a bivariate regression of whether or not the renegotiation outcome favors the borrower. Panel B presents estimated coefficients (in parenthesis) from an ordered probit in which the dependent variable is the number of original contract items renegotiated favorably to the borrower, which ranges from 0 to 4. Panel B also presents average marginal effects referring to the probability that 2 original contract items will be renegotiated in a borrower-friendly way. Average marginal effects are expressed as a percentage in both Panels. Industry fixed effects correspond to four possible classifications: Manufacture, construction, commerce, and services. Robust estimator of variance used. Statistical significance at the 1%, 5%, and 10% levels is denoted by \*\*\*, \*\*, and \*, respectively. Diagnostic tests for specification (5) in Panel A: Wald chi2: 188.90; p-value: .000; Pseudo R2: .113. Diagnostic tests for specification (5) in Panel B: Wald chi2: 866.63; p-value: .000; Pseudo R2: .432. Check Table 3 for variable definitions.

**Table 10**  
**Average number of key contractual terms renegotiated in favor of the borrower**

Borrower favorable		Borrower not favorable	
Delinquent loans	Non delinquent loans	Delinquent loans	Non delinquent loans
1.35	2.50	0.87	1.82

The table shows the average number of key contractual terms renegotiated in favor of the borrower in the 461 renegotiation outcomes labeled as borrower-friendly.