RISK–RETURN TRADE-OFF IN THE MARKET FOR LINES OF CREDIT

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Abstract: If return on revolving credit lines helps compensate lenders for wealth expropriation given moral hazard, borrowers' risk and lenders' return are expected to be positively related. Our main findings support this prediction, in contrast to the only previous work that examined this problem two decades ago. Nevertheless, we find evidence of mispricing regarding the undrawn portion of facilities. We also observe that renegotiation enhances the risk-compensating role of return. Moreover, insufficient renegotiation intensity can even reverse the risk–return relation.

Keywords: Asset substitution; Revolving credit lines; Renegotiation; Risk-return relation

E.F.M. Codes: 510, 530.

1. Introduction

As with other credit instruments, lenders entering into a credit line agreement run the risk of being expropriated through asset substitution (Jensen and Meckling 1976). As Smith and Warner (1979) put it, take a firm that enters into a credit agreement for the stated purpose of engaging in low-risk investment projects and the contractual provisions commensurate with that low risk. After origination, the value of the borrower's claims rises and that of the lender's decreases by substituting with high-risk projects. Hence, if external markets are not sufficient to solve the lender–borrower conflict (Long 1973, Fama 1978), the borrower has incentives to use the line of credit for these risky projects. If this eventually occurs, lender wealth can end up being expropriated.

This expropriation risk helps explain the motivation for provisions included in credit agreements (Tirole 2006, Chava and Roberts 2008). For instance, it helps understand why credit

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line contracts include a large set of covenants that allow lenders to decline making additional loans or even accelerating the facility (Wight et al. 2007). However, before covenants are triggered, return can compensate for credit risk deterioration and, hence, for any potential wealth transfer from lenders to borrowers (Asquith et al. 2005). In addition, since a large proportion of facility contracts include provisions that increase the costs associated with credit lines under a technical bankruptcy, the compensating role of return and the protective role of covenants can complement each other if the facility is not accelerated after a covenant violation. Moreover, the relevance of this kind of risk–return compensation can be even more central, since lenders often waive covenant breaches and contracts are frequently renegotiated in anticipation of and to avoid covenant violations (Roberts 2015).

On the basis that returns may compensate for increasing risk and, hence, help protect against wealth expropriation, we expect to observe that returns on corporate credit lines are positively related to corporate default risk. The empirical analysis of the hypothesis that returns on credit lines play a risk-compensating role has previously been carried out by Asarnow and Marker (1995). Nevertheless, despite the relevance of the risk–return relation for financial theory, no other empirical work has delved into this problem in the last 20 years. This lack of research is even more concerning, given the high percentage of corporate financing that credit facilities provide (Kashyap et al. 2002, Jimenez et al. 2009a, Sufi 2009), along with the fact that Asarnow and Marker (1995) find evidence of mispricing.

To perform our analysis, we focus on the annualized returns yielded quarterly by interest rate spreads and fees according to contractual provisions while the credit contract is outstanding, given the level of facility usage, and reduced by the loss given default (LGD); that is, we focus on the coupon return realized according to contractual provisions and diminished by the LGD. The reason we use this type of return is that it reflects how contracts define firms' quarterly risk premiums; thus, we can analyze whether contracts are designed so that risk premiums, diminished by bankruptcy losses and given actual usage, compensate for risk.

The risk–return trade-off depends on whether the facility's pricing and usage yield a return that adapts to corporate risk as circumstances evolve. However, credit contracts are inherently incomplete (Aghion and Bolton 1992). Accordingly, non-contractible aspects or unanticipated circumstances may lead to a precarious adaptation of return to risk. In this regard, Roberts (2015) states that renegotiation is a means of dynamically dealing with such incompleteness. Indeed, the author points out that renegotiation is primarily aimed at addressing unforeseen contingencies and, specifically, borrower risk. These findings are consistent with those of Gorton and Kahn (2000). In a model of renegotiation between a borrower and a lender in which the credit contract gives the latter a liquidation option, Gorton and Kahn (2000) show that the status quo is never the best option for the lender once bad news about the borrower are known; that is, if the arrival of negative information about the borrower's performance does not lead the lender to liquidate the credit agreement, the lender will renegotiate more advantageous terms. Renegotiation, therefore, can help align the lender's risk and rewards. In tune with this view of renegotiation, we expect that a highly active (in terms of renegotiation) lender–borrower relationship enhances the risk-compensating role of return.

As the discussion above has already suggested, examining the risk–return trade-off in the market for revolving facilities is related to but differs from the analysis of the relation between corporate risk and facility pricing: Since outstanding drawdowns are not constant, return depends on both pricing provisions and usage. Indeed, as Jones and Wu (2015) point out, lender profitability does not necessarily increase in interest rates and fees: Higher costs may decrease usage enough to reduce returns.[1] Therefore, studying the risk–return relation requires knowing how usage and pricing, besides corporate risk, evolve while the credit agreement is active.

This type of analysis is highly demanding in terms of data. To conduct it, we use five commercial databases and two linking databases. Additionally, we hand-collect data for a random sample of US publicly traded corporations that have at least one active credit line in the sample period. In this regard, first, we use 10-Q and 10-K US Securities and Exchange Commission (SEC) filings to obtain data on the quarterly usage of facilities at the credit line level. Although Standard & Poor's (S&P) Capital IQ provides data on usage, it does so at the firm level and does not always differentiate between revolving and term loans. Collecting data at the facility level, however, involves an obstacle: Large firms tend to have a considerable number of facilities simultaneously and usually disclose information about usage in an aggregate manner. To overcome this problem, we focus on firms with assets below $20 billion. This threshold makes sample firms comparable to mid- and small-cap firms. However, it does not seem a too

[1] Previous work has identified the right to draw down on a line of credit as a put option (Thakor et al. 1981, Hawkins 1982). In tune with Black and Scholes' (1973) pricing model, increases in the volatility of the asset underlying this contingent claim raises, all else being equal, the value of the option and, hence, the facility's spreads and fees should also increase (Calomiris and Wilson 2004, Berg et al. 2016). Nevertheless, higher spreads and fees do not necessarily imply higher returns.

restrictive a threshold, since less than 5% of non-financial US firms in S&P's Compustat universe have assets above $20 billion. Second, 10-Q and 10-K reports reveal that the main commercial database that provides data on lines of credit, Thomson Reuters Loan Pricing Corporation's DealScan, does not include a relatively large number of amendments to credit agreements (around 30% over the sample facilities). This flaw is extremely relevant to our analysis, which requires taking into account changes that could affect quarterly returns on facilities. Therefore, we use information in 10-Q and 10-K reports to find contracts missing from DealScan in the Electronic Data Gathering, Analysis and Retrieval (EDGAR) system. To obtain the entire set of sample contracts, we also collect the contracts of the facilities in DealScan. Third, we use this set of contracts to obtain information that DealScan does not cover or covers insufficiently.

Our primary result is that there seems to be a trade-off between risk and return in the market for lines of credit. Specifically, in our base model, a standard deviation increase in risk at the mean appears to increase annualized quarterly returns by 12.80%. The presence of such a trade-off is robust to different specifications and different measures of risk. It is an outcome, however, that is at odds with the results of Asarnow and Marker (1995), who observe that return and risk are not positively related. Nevertheless, another of our results is in line with those of Asarnow and Marker (1995): We find evidence suggesting that the market for lines of credit underprices the risk of drawdowns increasing as borrower creditworthiness deteriorates.

Additionally, our results support the hypothesis that renegotiation intensity strengthens the risk-compensating role of return; that is, an active lender–borrower relationship seems to contribute to a higher return for a given increase in corporate risk. Moreover, insufficient renegotiation intensity can even reverse the risk–return relation.

Although this paper builds on that of Asarnow and Marker (1995), their analysis has limitations that could help explain why they do not observe a positive relation between risk and return. We use information that they do not, such as facility-level data on usage and the determinants of the quarterly values of spreads and fees. Thus, our analysis is not performed at the level of a broad risk category but, rather, at the facility level and we do not assume constant levels of usage; that is, our data enable us to determine how returns evolve while facilities are outstanding and at the credit line level itself. Additionally, although we also perform a univariate analysis in the style of Asarnow and Marker (1995), we use a multivariate framework to examine the risk–return trade-off. To the best of our knowledge, this is the first paper to analyze the risk–return relation in the market for revolving facilities by means of multivariate econometric techniques. We expect, therefore, our work to help shed light on an almost unexplored area of research. As a contribution to this aim and based on our hand-collected data, we also describe features of facilities' pricing schemes to which previous academic works have paid little attention.

Our paper is also related to previous empirical studies examining the relation between corporate risk and pricing provisions in the market for credit lines (Shockley and Thakor 1997, Strahan 1999, Beatty et al. 2002, Asquith et al. 2005, Manso et al. 2010, Berg et al. 2016, Duran 2017). Our primary focus, however, is on returns instead of pricing features. In addition, in contrast to most of the previous work, we do not adopt a static approach that analyzes the relation between a contractual provision and risk on a given date (usually at origination): We examine the relation between risk and return dynamically while the facility is outstanding.

Additionally, this research is closely related to studies that have analyzed how financial covenants protect lenders through restricting borrower behavior (Dichev and Skinner 2002, Chava and Roberts 2008, Nini et al. 2009, Sufi 2009, Demiroglu and James 2010, Demerjian and Owens 2016). Our paper complements these previous works in the sense of analyzing whether return can also protect lenders from wealth expropriation by providing adequate compensation.

Finally, the analysis is related to previous works that have examined the renegotiation of loan contracts (Gorton and Kahn 2000, Roberts and Sufi 2009, Ivanov 2012, Roberts 2015, Nikolaev 2016), although the empirical effect of renegotiation on the risk–return trade-off has not been previously studied.

The rest of the paper proceeds as follows. Section 2 describes the data, sample construction, and summary statistics. Section 3 discusses the main features of facility pricing, along the assumptions used to compute returns. Sections 4 and 5 present, respectively, univariate and multivariate analyses of the hypothesis that returns help compensate for risk. Section 6 examines the effects of renegotiation on the risk–return relation and Section 7 concludes the paper. Appendix A defines the variables used in the analysis. Appendix B presents the pricing criteria used to define the quarterly value of spreads and fees. Appendix C shows the purposes for which credit lines can be used according to credit contracts.

2. Data and sample construction

This section describes the sample construction process, as well as the basic characteristics of the sample data. We also compare our sample to the Compustat and DealScan databases.

2.1. Sample construction: The starting dataset

The final dataset of our analysis is the result of merging information from five commercial databases and a manually collected dataset. We extract data on credit facilities from DealScan and quarterly accounting data on firms from Compustat. As Appendix B indicates, data from Capital IQ and Thomson Reuters Datastream are used in the computation of some of the criteria determining applicable interest rate spreads and fees. Data provided by the Center for Research in Security Prices US Stock Database (CRSP) are used to calculate the standard deviation of sample firms' daily stock returns. We merge this database and Compustat by means of the CRSP/Compustat Merged Database.

Our first step is to merge the DealScan and Compustat data. To do so, we use the linking database provided by Chava and Roberts (2008). This step allows us to obtain a dataset with the quarterly accounting data of firms that have at least one outstanding revolving credit line in the sample period, 2006:Q1 to 2012:Q2. Quarterly data are used due to the high frequency of credit agreement renegotiations, which makes changes in pricing schedules quite common in the life of credit facilities (Roberts and Sufi 2009, Roberts 2015, Nikolaev 2016). The sample period ends in 2012:Q2, because this is the last quarter covered by the DealScan–Compustat linking database. The main reason for using 2006:Q1 as the starting quarter of our analysis is the time cost involved in manually collecting information on the usage and features of credit lines. Our sample, nevertheless, extends through 26 quarters.

Once the starting DealScan–Compustat dataset is generated, we apply filters. We exclude firms in DealScan that cannot be matched to those in Compustat, as well as non-US and financial firms.[2] In addition, we only keep observations corresponding to dollar-denominated revolving lines of credit.[3] Following Sufi (2009), we also require firms in the DealScan–Compustat dataset to have a minimum number of consecutive quarters in Compustat, with active lines of credit.[4]

[2] To exclude financial firms, we drop firms with Standard Industrial Classification (SIC) codes 6000–6999.

[3] Following Berg et al. (2015), we select loan commitments whose DealScan variable *loantype* is either *Revolver/Line < 1 Yr.*, *Revolver/Line >= 1 Yr.*, *364-Day Facility*, *Limited Line*, or *Revolver/Term Loan*.

[4] Sufi's (2009) condition is more restrictive: It requires firms to have at least four consecutive years (in an eight-year period) of positive data for the main variables of the analysis. To describe our condition in a more detailed manner,

This condition is established to reduce the probability of credit lines with no observations in the final, randomly chosen dataset.

Large corporations tend to have a relatively high number of lines of credit active simultaneously and usually report on their usage in an aggregate manner. This aggregate information does not allow for computing returns at the facility level and, hence, is inadequate for our research goal. Accordingly, to make it possible to hand-collect disaggregated data, we exclude from the DealScan–Compustat dataset firms with an asset book value above $20 billion in any sample quarter. This $20 billion threshold is based on the fact that the maximum asset value of a firm included in the S&P MidCap 400 or SmallCap 600 indexes during the sample period amounts to $19.921 billion.[5] Therefore, since sample firms are not necessarily part of these stock indexes, any bias associated with being listed is avoided, but the companies listed in these indexes resemble sample firms in terms of maximum size. The threshold, nevertheless, does not seem too restrictive: Among non-financial US companies included in Compustat in 2006:Q1–2012:Q2, 96.37% have an asset size below $20 billion during the whole period.

The DealScan–Compustat dataset has 206,883 facility–quarter observations that refer to 8,908 lines of credit and 2,545 firms. We randomly sample 150 firms from this dataset. Our manual data collection process is based on these firms' lines of credit.

2.2. Sample construction: The manually collected dataset

The aim of manually collecting data is to obtain information on aspects of lines of credit that are not adequately covered by commercial databases. Specifically, we address three main gaps. Regarding the first one, SEC regulation compels firms to provide detailed information about their credit lines in 10-Q and 10-K reports (Kaplan and Zingales 1997, Sufi 2009). These reports

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let us define the concepts *starting quarter* and *ending quarter* by means of an example. Consider a firm that is included in Compustat between 2006:Q2 and 2010:Q2 and that has two lines of credit active in the sample period 2006:Q1 to 2012:Q2. The origination (maturity) quarters of these lines are 2006:Q3 (2007:Q3) and 2007:Q2 (2103:Q2), respectively. In this case, the starting quarter is the latest between 2006:Q2 or 2006:Q3, that is, the latest quarter between the first quarter in which the firm is included in Compustat (2006:Q2) and the earliest quarter among the origination quarters of the facilities the firm has in the sample period (2006:Q3 between 2006:Q3 and 2007:Q2). If the latest quarter between the candidates 2006:Q2 and 2006:Q3 is earlier than 2006:Q1, the starting quarter would be 2006:Q1. The ending quarter is the earliest between 2010:Q2 and 2013:Q2, that is, the earliest quarter between the last quarter in which the firm is included in Compustat (2010:Q2) and the latest quarter between the maturity quarters of the facilities the firm has in the sample period (2013:Q2 between 2007:Q3 and 2013:Q2). If the earliest quarter between the candidates 2010:Q2 and 2013:Q2 is later than 2012:Q2, the end quarter would be 2012:Q2. Given these definitions, we require firms to have at least four consecutive quarters between the starting and ending quarters.

[5] This value was achieved by Republic Services Inc. in 2008:Q4.

reveal a relevant limitation of DealScan: Firms refer to amendments to existing lines of credit—and occasionally to newly originated facilities—that this database does not include. Therefore, the information provided by this commercial database could be insufficiently accurate for analyzing the risk–return trade-off: Amendments to the pricing schedule or to any other relevant aspect of a facility could have been agreed upon without DealScan reflecting these changes. To overcome this limitation, we search for amendments—or new revolving lines of credit—not covered by DealScan in the list of exhibits that appears at the end of 10-Q and 10-K reports. Reference to an exhibit in this list is usually complemented by information that allows us to locate the original credit contract in EDGAR.[6] Once we find the agreement, we include it in our dataset if, as Roberts and Sufi (2009) require, it refers to a new line of credit or amendment that does not leave unchanged the principal, interest rates on drawdowns, fees, or maturity.[7] Any information referring to manually added facilities is hand-collected directly from the credit contracts themselves. We also collect the credit contracts of sample facilities covered by DealScan. The latter contracts are used to obtain information about features of facilities not covered or insufficiently covered by DealScan.

Manually added facilities constitute almost a third (31.04%) of all the lines of credit in our dataset. The vast majority (89.61%) of these added lines were amendments and amended and restated agreements.[8]

The second gap that we cover by manually gathering data refers to information not provided by commercial databases. In this respect, we collect data on credit line usage and availability at the facility level from 10-K and 10-Q reports. The only commercial database that provides this

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[6] For instance, the 2011 10-K filing of Moog Inc. lists the following exhibit: "Third Amended and Restated Loan Agreement … dated as of March 18, 2011, incorporated by reference to exhibit 10.1 of our report on Form 8-K dated March 18, 2011." Accordingly, the credit agreement can be found as exhibit 10.1 and attached to an 8-K report dated March 18, 2011. This exhibit was filed a few days later, on March 21, 2011. Sometimes, however, the search process is not so straightforward, mainly because the list of exhibits does not provide information about the filing date and this date is not close to the date of the report to which the agreement is attached. In these cases, a large number of filings around the origination date must be consulted before the credit contract is found.

[7] Our method, however, is more exhaustive than that of Roberts and Sufi (2009). Their conclusion about whether a renegotiation has taken place depends on whether the firm discloses changes in the features of the credit agreement in 10-Q and 10-K reports, whereas we search for these changes directly in the credit contracts.

[8] Our dataset also includes what we call *artificial facilities* (8.87%). We introduce this category to reflect situations where the principal of a credit line changes not through an amendment but according to provisions included in the credit agreement itself. For instance, the fifth amendment to a loan agreement dated December 21, 2007, and entered into by Cascade Corporation includes the following clause: "The Aggregate Commitments shall be reduced by $1,250,000 on a quarterly basis beginning on March 31, 2008, and continuing on the last day of each subsequent quarter for so long as this credit facility is active."

type of information is Capital IQ, but it does so at the firm level and does not always differentiate between revolving lines of credit and term loans.[9]

An example of how firms disclose their credit line usage is provided by Arch Coal Inc. in its 2011 10-K filing: “As of December 31, 2011, we had borrowings of $375 million under our $2 billion dollar revolving credit facility.” Nevertheless, although public firms must legally report on their credit lines, there is no explicit requirement for disclosing facility usage. Therefore, we drop any quarter–facility observation for which we find no data on outstanding borrowings. Similarly, we drop facility–quarter observations for which, despite the $20 billion threshold on corporate asset size, a firm reports outstanding borrowings under its facilities in an aggregate manner.

We also manually gather information on other features of facilities that are not covered by commercial databases. If a facility has a borrowing base, we collect data on its quarterly value if available. We generate a variable that indicates the date at which a credit contract stops being active either because it matures or for any other reason, such as its amendment or cancellation. Thus, we can compute the actual duration of any contract and can rebuild the entire loan path of any original contract, that is, any chain of amendments following the origination of a revolving facility and ending in a terminal event (Roberts 2015). Additionally, we collect data on whether a firm is in technical default on a facility in a given quarter as a result of violating a financial covenant. To compute returns on facilities as accurately as possible, we also check 10-K and 10-Q reports to determine whether firms are granted waivers that remove increases in fees or rates applicable under technical default.

To address the third gap, we hand-collect data that are insufficiently covered by commercial databases. As Roberts and Sufi (2009) point out, DealScan’s coverage of data on pricing schedules has limitations. Accordingly, we collect data that allow us to determine the quarterly values of fees and interest rates; specifically, we collect data on the types of base rates, spreads and fees, any criterion or margin involved in determining applicable base rates, the values of the spreads and fees if fixed, the pricing criteria and pricing grids if variable, and other provisions that could modify applicable interest rates or fees such as those referring to technical default. On

[9] For instance, according to the variable *activebalrrevolvingcredit* of Capital IQ, Time Warner Inc. had $12.381 billion of revolving credit active at the end of 2006. Nevertheless, the 10-K filing indicates that this amount corresponds to four different loan commitments; that is, data are aggregated at the firm level. Moreover, two of those loan commitments were terms loans. For more details on the features of Capital IQ, see Manakyan and Giacomini (2014).

the basis of this hand-collected data, we discuss in the following section the main features of facility pricing.

Regarding the purposes of facilities, DealScan includes the variables *primarypurpose* and *secondarypurpose*, which refer to what seem to be the main and auxiliary purposes, respectively, for which credit facilities can be used. Nevertheless, typical credit agreements, first, do not establish any priority among purposes and, second, frequently include more than two purposes.[10] Accordingly, we hand-collect data on credit line purposes. This information is shown in Appendix C. Around half of the sample credit lines (49.80%) have more than two purposes and only 17.94% have a single purpose. To deal with the complexity resulting from this variety of purposes, we follow Ivashina and Scharfstein (2010): We split credit lines between those that could be used for corporate restructuring—leveraged buyouts, mergers and acquisitions, and stock repurchases—and the remainder.

For the sample facilities included in DealScan, we check the data that this database provides on principal and maturity with credit contracts. Besides reducing the probability of potential errors, this comparison avoids situations where, for instance, credit line usage is greater than the facility principal. The percentages of credit contracts that differ from DealScan in terms of commitment amount and maturity are the same (7.01% of the sample facilities in DealScan).[11] Additionally, when the secured/unsecured status of a facility is missing from DealScan, we check whether contracts provide this information. This is the case for just 2.24% of the sample facilities in DealScan.

We also manually gather information on bankrupt firms. We define default as a situation in which a company files for bankruptcy. Since SEC reporting companies filing a petition for bankruptcy must disclose this information in item 1.03 of Form 8-K,[12] we check the EDGAR database to determine whether sample firms have filed such items with the SEC. Thus, we also

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[10] For instance, the credit agreement of Pacific Sunwear of California Inc., dated September 14, 2005, states, "The proceeds of the Loans will be used only to refinance certain existing credit facilities of the Borrower and to finance the working capital needs, capital expenditures, acquisitions (including Permitted Acquisitions), dividends, distributions and stock repurchases, and for general corporate purposes of the Borrower and its Subsidiaries."

[11] Four sample facilities (with DealScan unique identifiers 175829, 184660, 208598, and 226103) modify their principal either between origination and the end of the origination quarter or before 2006:Q1. We directly use the modified principal as the commitment principal but do not consider these cases among those in which DealScan and credit contracts differ.

[12] See https://www.sec.gov/investor/pubs/edgarguide.htm.

obtain the date when firms in default filed for bankruptcy, which, being public knowledge, is the date we consider the default date.

The last step in the construction of the dataset is to drop facility–quarter observations for which available information does not allow us to compute income generated by applicable fees and interest rate spreads. This condition yields our final sample: an unbalanced panel of 2,107 facility–quarter observations that includes 496 facilities.

2.3. Summary statistics

Table 1 presents summary statistics for facility features other than pricing and return. All the variables are defined in Appendix A. The statistics are calculated as if there were one observation per facility, except for technical default and zero outstanding borrowings, whose statistics are computed over firms and the total number of observations, respectively. Approximately two-thirds of the sample facilities (63%) are secured and most (93%) are syndicated. The average sample line has a stated maturity slightly shorter than 43 months and a principal of approximately $270 million. Corporate restructuring is among the purposes of about half (47%) of sample facilities, outstanding borrowings are not zero for approximately half (52%) of facility–quarter observations, and the rate of firms violating covenants in our dataset is 17%.

[Table 1]

For comparison purposes, Table 1 also presents statistics for revolving lines of credit in DealScan, denominated in US dollars, active in the sample period and made to non-financial US firms. These facilities are quite similar to those in our sample, although the percentages of secured and syndicated lines are lower in the sample lines (16% and 5% less, respectively). In addition, sample facilities have a slightly shorter average maturity (seven months shorter) and a somewhat larger average commitment ($4 million more).

[Table 2]

Table 2 presents summary statistics of the main characteristics of sample firms and non-financial US firms in Compustat during the sample period. Relative to the latter database, our sample contains firms that are, on average, less highly levered and more profitable and which have slightly more asset tangibility and better coverage ratio. However, sample firms have lower current and market-to-book ratios, have less net worth, are smaller, and, according to the Kaplan–Zingales (1997) index, are more financially constrained. In addition, the capital expenditures of sample firms are below the level of Compustat firms. Overall, these differences are consistent with our sample selection criteria, since, on the one hand, we require firms to have an asset size below $20 billion in all sample quarters and, on the other hand, we focus on firms with at least one outstanding credit line in the sample period. Regarding default, 4% of sample lines file for bankruptcy.

3. Pricing and returns

Before proceeding to the empirical analysis of the risk-compensating role of returns, we discuss the main characteristics of the interest rates and fees of lines of credit. In addition, we define the type of returns on which our analysis is based and specify how they are computed.

3.1. Credit line pricing: Interest rates and fees

This section describes the main features of credit line pricing. In all except for one fixed rate facility,[13] sample credit lines charge an interest rate on drawdowns equal to a base rate that is periodically reset plus a spread. Accordingly, we first analyze base rates and then proceed to describe spreads. Finally, we will focus on fees.

The base rates define the types of loans that can be drawn down from credit lines. The standard differentiation that credit agreements make is between the London Interbank Offered Rate (LIBOR) and alternate base rate (ABR) loans. As Wight et al. (2007) and Duran (2017) point out, most credit lines give firms the chance to choose between borrowing either of these types and to convert one type to the other while loans are outstanding; specifically, 92.34% of sample facilities include this option.[14]

Under most LIBOR loans, the base rate is the prevailing LIBOR for a term equivalent to the maturity of the drawdown, as decided by the borrower among those offered by the credit agreement, typically one, two, three, or six months. However, a marginal proportion of credit

[13] This fixed rate line was entered into by Miller Energy Resources Inc. on June 29, 2012. In line with our data, the sample of Shockley and Thakor (1997) includes only 13 fixed rate agreements out of 2,526.

[14] This option can be illustrated with the credit agreement of Triquint Semiconductor Inc. dated September 30, 2010. The contract gives the borrower the option to select Eurodollar or base rate loans (in our wording, LIBOR or ABR loans) and to switch between them: "Each Borrowing, each conversion of Loans from one Type to the other, and each continuation of Eurodollar Rate Loans shall be made upon the Borrower's irrevocable notice to the Administrative Agent … Each Loan Notice … shall specify … the Type of Loans to be borrowed or to which existing Loans are to be converted."

agreements fix the maturity period and, hence, the applicable LIBOR. In our sample, 1.21% and 4.84% of the credit lines fix a three- and a one-month maturity, respectively.[15]

Some contracts establish the base rate ultimately used to determine the interest rate on a LIBOR loan to be the greater of the applicable LIBOR or a fixed percentage (2.62% of the sample lines). Additionally, for very few credit agreements, the final interest rate on LIBOR loans is not the sum of the applicable LIBOR plus a margin but, instead, the greater value between this sum and a fixed percentage (0.40%).

Regarding ABR loans, the base rate is a given rate or the greatest among a set of rates to which a percentage is sometimes added.[16] In all sample lines where no set of rates is competing to be the ABR (13.24% of the sample lines with ABR), the latter is always a prime rate, either the prime rate reported by *The Wall Street Journal* or one of the lenders' official prime rates. When multiple rates compete to be the ABR, a prime rate is always among them. Another candidate present in most credit agreements with an ABR is the federal funds rate plus a margin (85.50%), which is commonly equal to 50 basis points (bps). Some contracts include among the competing candidates a fixed percentage (2.10%). An increasing tendency during the sample period is to include the one- or three-month LIBOR plus a percentage as one of the candidates. In this sense, just 3.38% of the sample credit lines with an ABR that were active before the end of the 2008 crisis included the LIBOR among the competing rates, whereas this percentage rises to 72.19% among credit lines with an ABR outstanding after 2009:Q2. This sharp increase can be framed as a general tendency to make facility pricing more flexible and adaptable to changing circumstances.

Margins added to the applicable base rates may be fixed or variable. If they are fixed, the spread charged on drawdowns is constant for the life of the contract. Among samples lines that allow borrowing ABR (LIBOR) loans, 39.71% (19.29%) charge fixed spreads on this type of loans. Variable margins change over time according to an agreed schedule or are dependent on

[15] In addition, to take into account reserve requirements for Eurocurrency liabilities and, thus, compensate lenders for additional costs associated with obtaining funds from the Eurodollar market, the LIBOR is transformed into what credit contracts usually call the "adjusted LIBOR." We can, however, disregard the difference between the LIBOR and the adjusted LIBOR, since those requirements are zero during the sample period.

[16] For instance, according to the fifth amendment dated November 12, 2008, to the amended and restated credit agreement dated November 4, 2005, of Petroleum Development Corporation, the base rate of ABR loans is a "rate per annum equal to the greatest of (a) the Prime Rate in effect on such day, (b) the Base CD Rate in effect on such day plus 1%, (c) the Federal Funds Effective Rate in effect on such day plus ½ of 1%, and (d) the Adjusted LIBO Rate for a one month Interest Period on such day … plus 1%."

one or more pricing criteria that reflect corporate performance or credit line usage (e.g., Appendix A of Asquith et al. 2005). Most credit lines determine applicable spreads in terms of a single pricing criterion, but multiple criteria are not unusual (see Table B2 in Appendix B).

If a firm breaches a credit line's financial covenants—that is, is in technical default—and does not obtain a waiver of compliance on this violation, the interest rate in effect is increased by a default margin. Additionally, some credit agreements that give borrowers the chance to choose between ABR and LIBOR loans restrict this option under a technical default, allowing only ABR loans. For sample credit lines involved in technical defaults, the average default margin to be added to the applicable interest rate is 243.06 bps and 22.22% of those credit lines restrict the types of available loans. However, technical default rarely leads to margin increases: Such penalizations are waived for most covenant violations (83.33%).

With respect to fees, following Asarnow and Marker (1995), we do not take into consideration fees that are not distributed among all lender members of a syndicated credit line, such as syndication and agency fees, or fees that are marginally present (Berg et al. 2016). Specifically, we focus on the four main types of fees in revolving credit lines: commitment, annual, utilization, and upfront fees.[17]

Commitment fees are charged on the unused parts of credit lines, whereas annual fees are levied on the entire commitment amounts, used or not. Utilization fees are charged on used amounts if and while an agreed upon usage threshold is exceeded.[18] Among sample lines, 78.63%, 17.74%, and 5.24% have commitment, annual, and utilization fees, respectively. Just as interest rate spreads, fees can be constant or variable. In the latter case, one or more pricing criteria determine the applicable fee. The percentage of credit lines with fixed commitment (annual, utilization) fees over the total number of sample lines with this type of fee is 41.28% (9.09%, 57.69%).

[17] A cancellation fee is a one-time charge against early termination or commitment reduction. This type of fee is not activated in any of the sample credit lines that include it. Hence, early termination fees are irrelevant in determining returns on sample facilities.

[18] In some cases, DealScan confuses utilization fees with situations in which the interest rate spread depends on facility usage. This typically happens when a credit line (1) offers the option to borrow LIBOR and ABR loans, (2) the spread of ABR loans is fixed, and (3) the spread of LIBOR loans depends on a set of criteria, one of them being usage. An example is the amended and restated agreement, dated March 31, 2006, between Allergan Inc. and a syndicate of financial institutions. This agreement provides the option to borrow ABR loans with a fixed spread equal to zero. It also allows Allergan Inc. to borrow LIBOR loans. The spread on the latter depends on the firm's rating and whether the usage-to-principal ratio is above or below 50%. Therefore, in contrast to the definition of a utilization fee, a level of usage over 50% implies an extra charge on LIBOR loans, but not on the entire amount used. Nevertheless, DealScan considers that this credit line includes a utilization fee.

Upfront fees are single charges that borrowers pay at origination. As for the rest of the data on credit line pricing, we hand-collect data on upfront fees directly from credit agreements. Thus, for a significant amount of credit lines, we have obtained information on this type of fees that DealScan does not include.[19] Nevertheless, a number of credit agreements mention that upfront fees, if any, are accounted for in nonpublic fee letters. According to Berg et al. (2015), contacts within the credit industry give DealScan an advantage in access to this nonpublic information. Therefore, although a credit contract makes no reference to an upfront fee, we consider that the corresponding credit line includes such a fee if DealScan does.

3.2. Computing returns on credit lines

This paper aims to test the hypothesis that returns on credit lines play a risk-compensating role that, along with other contractual features, helps palliate potential lender wealth expropriation from borrowers substituting low-risk with high-risk projects (Jensen and Meckling 1976). Accordingly, we focus on the returns that, on the basis of data availability, allow us to capture how facility contracts define borrowers' risk premiums. Specifically, the dependent variable of our base analysis is the annualized quarterly coupon return diminished by bankruptcy losses; that is, it is the annualized return that, taking into account the LGD and given the level of usage, interest rate spreads and fees yield quarterly in tune with the terms of the credit contract and while the latter is active.[20]

The remainder of this section mentions the assumptions that we adopt to compute returns and other technical aspects regarding their calculation. We also define and plot the all-in-spread drawn (AISD) and undrawn (AISU).

3.2.1. Returns

Given the complexity of credit line pricing and data availability, we make some assumptions to calculate returns. Although some of our assumptions follow those of Asarnow and Marker (1995), we have data on quarterly usage at the credit line level and detailed information on credit lines' interest rate spreads and fees. Thus, besides avoiding assumptions on usage and relaxing

[19] One of the reasons why DealScan insufficiently records the information on upfront fees available in credit agreements is that this database includes a relatively low fraction of amendment fees, that is, upfront fees paid by borrowers on amendment closing dates. In addition, although a large number of the credit lines included in DealScan's *facilityamendment* table have upfront fees, DealScan does not reflect this information.

[20] Note that we do not take into account income generated by the base rates of interest rates, because base rates do not define risk premiums. In addition, due to data unavailability, we do not consider price returns or potential losses of firms that do not default in the sample period.

those that these authors made on pricing, our analysis is performed at the facility level and not on a broader category, such as major rating classifications; that is, in contrast to Asarnow and Marker (1995), we do not assume that the required spreads and fees of the (newly issued or not) facilities of a firm with a given level of risk are equal to the average spreads and fees of newly issued facilities of firms with the same risk. In addition, we do not assume that all firms with the same level of risk have an equal and constant level of facility usage.

We assume that loans are reset quarterly, because this is the frequency at which variable spreads and fees are actually modified and also because it is the frequency of our data on credit line usage. Indeed, we compute the value of quarterly returns at quarter-ends. As already mentioned, a large majority of credit contracts allow ABR or LIBOR loans. Since we have no information on how usage distributes between these loans, we make an assumption about the chosen type and, hence, the applicable interest rate at each reset time. Following Asarnow and Marker (1995), we assume that borrowers are cost minimizers, that is, they borrow the type of loan with the lowest interest rate. If a credit line allows ABR and LIBOR loans but we just have information on the interest rate charged on one of these types, we use the latter rate. Similarly, if we cannot calculate the fee of a credit line in a quarter, we use available data on this facility's pricing. For those credit lines in which a lender's official prime rate is used to determine ABR, we assume that this rate equals the prime rate reported by *The Wall Street Journal*.

We amortize upfront fees on a straight-line basis, that is, for a given upfront fee, the amount amortized each quarter is equal to the fee divided by the quarterly duration stated in the agreement. Since renegotiation through amendments is quite frequent, we can consider that, for amortization purposes, an original contract is still in existence, with the maturity stated in the contract as the limit, through successive amendments. Thus, we assume that any upfront fee—included in either the original contract or any of the amendments in the loan path—can be amortized while an amendment is in effect and by the amendment in effect. Indeed, we take into account any upfront fee included in any amendment of the sample facilities, even if the amendment does not modify the principal, pricing, or maturity. We use alternative amortization schemes in robustness tests.

To calculate the income generated by commitment fees, we use the available amount to borrow under credit commitments. This amount is usually reported in 10-Q and 10-K filings but, if not, we compute it. In those cases in which we are dealing with a credit line that has a borrowing base (or a program to support the issuance of letters of credit) but we have no data on the borrowing base (or letters of credit outstanding) for a quarter, we assume that the borrowing base is equal to the total commitment (or there are no letters of credit outstanding).

To take into account the losses that defaulting borrowers inflict on lenders, we factor the LGD in returns. To do so, consider the last revolving facility of an outstanding loan path when the holding firm files for Chapter 11 protection. We define the LGD as the present value on the default date of the lost income that, for the level of usage at default, would have been yielded by the spread and fees of the facility between bankruptcy and maturity. To factor the LGD in returns, the loan path's quarterly coupon income is diminished in the amount that results from dividing the LGD by the number of quarters between the start of the loan path and bankruptcy. The interest rate of the discount factor used is the three-month Treasury bill rate, as reported by the Federal Reserve of St. Louis. Due to data unavailability, we assume a standard LGD rate. Specifically, following Asarnow and Marker (1995) and in line with previous estimations of this rate,[21] we assume that it is equal to 34.8% over the present value of the total coupon income that a line of credit would have generated after bankruptcy and until maturity.

Since the focus of our analysis is on how facility contracts define borrowers' risk premiums, the numerator of the return is the quarterly coupon income diminished by the LGD. The denominator equals outstanding borrowings plus the amount of capital that the lender must legally set aside to cover contingent exposure to the unused portion of the commitment. This amount of capital results from multiplying the available portion of the line of credit times a so-called credit conversion factor, whose value depends on the duration of the commitment. In the sample period, this factor is 0.5 if the maturity of the facility is longer than one year and zero otherwise.[22] However, since the Code of Federal Regulations establishes 14 months as the maturity threshold that makes the conversion factor equal to zero, we perform a robustness analysis where the latter threshold is used to compute the denominator of return. In addition,

[21] In a study of 24 years of defaulted commercial and industrial loans at Citibank, Asarnow and Edwards (1995) find this LGD rate to be equal to 34.8%. Using Moody's data, Gupton et al. (2000) observe that the mean bank loan value in default is 69.5% for senior secured loans and 52.1 for senior unsecured loans. Since 63.29% of our sample lines are secured, the LGD rate applicable to our sample according to these authors is 36.89%, very close to the markdown that we use. Based also on Moody's data and holding seniority constant at the senior secured level, Schuermann (2004) reports that the LGD rate for bank loans is 36.90. Analyzing 18 years of loan loss history at JP Morgan Chase, Araten et al. (2004) conclude that the mean economic LGD rate is 39.8%.

[22] See Section D, Conversion Factors for Off-Balance Sheet Items, of the Federal Deposit Insurance Corporation Rules and Regulations, Appendix A to Part 325, Statement of Policy on Risk-Based Capital.

given that the denominator of the return is zero for facilities with no outstanding borrowings and a maturity below one year (or 14 months in the robustness check), we also test whether our results are robust to a conversion factor of 0.5 for all facilities.

3.2.2. Applicable interest rates and fees: AISD and AISU.

To determine applicable spreads and fees when they are variable, we require detailed data on pricing criteria. Since DealScan's coverage in this regard has significant limitations, we obtain this information directly from credit contracts. Pricing criteria are shown in Appendix B. To maximize the level of accuracy in the computation of pricing criteria, we use available data from Compustat, DealScan, Capital IQ, and Datastream, as well as manually collected data. Our calculations are based on 51 pricing criteria. According to some credit agreements, applicable margins and/or fees are determined by more than one criterion. As Table B2 in Appendix B indicates, this is the case for 5.01% of sample lines with a pricing grid.

Once the quarterly values of pricing criteria are determined, we can calculate the quarterly applicable spreads and fees and, hence, also obtain the AISD and AISU. The former describes the costs—leaving base rates aside—associated with takedowns. According to DealScan, it is equal to the spread over LIBOR loans (or ABR loans, if the credit line does not allow LIBOR loans) plus the annual fee. However, in tune with what the AISD stands for, we also add the utilization fee. The AISU measures the costs on amounts available under a credit agreement and, hence, adds the commitment and annual fees. The average AISD and AISU of the sample lines are 180.02 bps and 31.50 bps, respectively. Figure 1 shows how their values change during the sample period.

[Figure 1]

Figure 1 indicates that the costs associated with usage and the right to use facilities follow very similar trends through the sample period. Just before the 2008 crisis begins, in 2007:Q4, the AISD and AISU start an almost uninterrupted increase that continues after the end of the crisis and peaks in 2011:Q2. In this quarter, the AISD and AISU equal 247.25 and 39.92, respectively; that is, they have increased by 86.21% and 55.00%, respectively, from their troughs in 2007:Q2.

In tune with the distinction between the AISD and AISU, we also distinguish between two components of return. The first one is closely related to the AISD: It is the return associated with credit line usage, specifically, the return yielded by the applicable spread of interest rates and annual, utilization, and upfront fees. The second component is associated with the right to draw down on credit lines and, hence, is linked to the AISU. This component is the result of the income that annual, commitment, and upfront fees generate. We call the first and second components AISD and AISU returns, respectively.[23] Both of them are reduced by the LGD corresponding to the spread and fees used in their calculations.

4. Risk–return trade-off: Univariate analysis

This section performs a univariate study of the risk-compensating role of returns in the market for revolving lines of credit. Table 3 summarizes our main findings. It shows the average annual coupon return on revolvers for the whole sample and by risk category.[24] Following Santos (2011), Roberts (2015), and Berg et al. (2016), we use the standard deviation of firms' daily stock returns to proxy for the probability of bankruptcy. Accordingly, risk categories are given by the quintiles of this standard deviation. We have also computed the mean annual AISD and AISU returns.

In their analysis, Asarnow and Marker (1995) find evidence of mispricing in the facility market. Specifically, Exhibits 4 and 7 of Asarnow and Marker (1995) suggest no trade-off between risk and return. Indeed, higher-risk firms yield lower mean annual returns on revolving facilities, whereas lower-risk firms generate higher returns. However, as the first row of Table 3 shows, our univariate analysis suggests that risk and return are positively related: From a value of 0.85% for the credit lines of firms in the lowest risk category, the return increases category by category, up to the highest, where the total return equals 1.53%.

[Table 3]

The second row of Table 3 indicates that a similar pattern characterizes the AISD return, except for the two lowest risk categories, which have the same returns. Therefore, there also seems to be a trade-off between risk and the return associated with facility usage. However, as the third row of the table suggests, there is some ambiguity in the relation between risk and the AISU return, that is, the return yielded by the right to use facilities. Although, within a narrow

[23] Although the first and second components are closely related to the return that would be yielded by DealScan's AISD and AISU, respectively, there are differences among them. Regarding the first component, on the one hand, DealScan's AISD does not take into account utilization and upfront fees and, on the other, the spread used to compute DealScan's AISD is that of the LIBOR and not the spread of the interest rate applicable under the assumption that borrowers are cost minimizers. With respect to the second component, DealScan's AISU does not include upfront fees.

[24] To obtain the mean annual return for either the whole sample or each risk category, we calculate the average return of the sample facilities per quarter. Then, we compute the compound cumulative return. The mean annual return is the geometric average of this cumulative return.

range of variation, this return steadily increases across the first four risk categories, from 0.44% to 0.59%, it then decreases to 0.55%. Such ambiguity regarding the relation between risk and the AISU return raises concern about whether credit lines underprice the borrower's option to draw additional funds under a liquidity shock, as Asarnow and Marker (1995) have already pointed out. This conclusion will be further analyzed in the following section.

5. Risk–return trade-off: Regression analysis

In this section, we present a multivariate econometric approach to test the hypothesis that returns on revolving facilities have a risk-compensating role.

5.1. Empirical model

To examine whether empirical evidence supports this hypothesis, we estimate the following empirical model:

$$Return_{i,t} = \alpha + \beta \cdot Risk_{j,i,t} + \sum_{k=1} \gamma_k \cdot F_{k,j,i,t} + \sum_{h=1} \delta_h \cdot L_{h,i,t} + \sum_{s=1} \theta_s \cdot C_{s,t} + \varepsilon_{i,t}$$

In the base case, $Return_{i,t}$ stands for the return yielded by facility i in quarter t and $Risk_{j,i,t}$ stands for the probability of default, as captured by the standard deviation of the daily stock returns during quarter t for firm j, holding line i. If returns play a risk-compensating role, we expect β to be positive.

To test this prediction, our model controls for a set of firm- and credit line–specific variables: $F_{k,j,i,t}$ and $L_{h,i,t}$, respectively. In addition, to control for the effects of the 2008 crisis and any tendency in returns or financing costs during the sample period, we include $C_{s,t}$, which stands for a (0, 1) indicator variable for the crisis period, which, according to the NBER, ranges from 2007:Q4 to 2009:Q2, and a linear time trend. Finally, $\varepsilon_{i,t}$ is a random error term that is assumed to be correlated within facility observations and potentially heteroscedastic. To take this assumption into account, we use ordinary least squares regressions clustered at the facility level (Roberts 2015). We also include one-digit SIC code industry and quarter (0, 1) indicator variables to capture potential effects that are not controlled by the rest of the regressors. Additionally, following Santos (2011) and Berg et al. (2016), we include dummy variables for firms' credit ratings.

Regarding firm-specific controls, we include six variables that capture the most frequent types of financial covenants found in dollar-denominated revolving lines of credit outstanding in the sample period and entered by non-financial US public firms; that is, we include variables that proxy for leverage, coverage, capital expenditures, net worth, current ratio, and profitability.[25] As Appendix A shows, the way in which we define such variables is based on standard definitions of the covenants in credit contracts (Wight et al. 2007). Controlling for how covenants can influence the risk–return relation is relevant because covenants can affect the usage of and, therefore, returns on lines of credit (Sufi 2009). Since covenants reflect aspects of borrower performance that are an explicit source of concern for lenders, we expect the variables that proxy for covenants to be positively (negatively) related to returns if higher values of these variables are negative (positive) in the eyes of lenders.[26] Accordingly, we expect leverage, coverage, net worth, the current ratio, and profitability to be negatively related to returns,[27] whereas we expect a positive relation between capital expenditures and return.

We also include three more control variables for firms' characteristics that can alter the risk–return relation: size, the market-to-book ratio, tangibility, and financial constraints. Since larger firms are more diversified and less likely to file for bankruptcy, we expect size to have a negative effect on return. The market-to-book ratio serves as a proxy for firms' growth opportunities and, therefore, we expect an increasing market-to-book ratio to be positive for lenders and negatively related to return. Regarding tangibility, in the case of bankruptcy, firms

[25] According to DealScan, 26% of dollar-denominated revolving facilities outstanding in the sample period and entered by non-financial US public firms include debt-to-EBITDA covenants (38% include debt-related covenants); 35%, coverage covenants; 12%, capital expenditure covenants; 9%, net worth covenants; and 3%, current ratio covenants. Additionally, 70% include cash flow-based covenants. A similar distribution is obtained if we restrict the set of credit lines to sample facilities for which DealScan provides information on covenants. Chava and Roberts (2008) and Sufi (2009) provide also comparable data on the use of covenants among public corporations.

[26] Although the standard deviation of stock returns is a widely used proxy of corporate risk (Santos 2011, Roberts 2015, Berg et al. 2016), the most common variables in financial covenants (leverage, coverage, net worth, current ratio, and profitability) can also capture firm risk. Nevertheless, following Sufi (2009), these variables are included in the regression model to control for the potential effects of covenants on usage and, therefore, returns. Indeed, since covenants can affect usage and we define this group of variables following their standard characterization in contractual covenants, these variables could have mechanical relations with returns. Additionally, although we do not have enough defaulting firms to perform a binary choice test, the data suggest that the standard deviation of stock returns outperforms these covenant-based variables in predicting default. Specifically, for each defaulting firm in the sample, we calculate the mean values of the standard deviation of stock returns and the covenant-based variables between $t-8$ and $t-5$ and between $t-4$ and $t-1$, t being the bankruptcy quarter; then, we compute the percentage change between these mean values. Thus, once we average out defaulting firms, we obtain a measure of the variations of the variables between the periods $t-8/t-5$ and $t-4/t-1$. In this univariate analysis, the best predictors of default would be those variables with the highest variations between those two periods. In this sense, such a change is 177.51% for the standard deviation of stock returns, whereas the highest change, in absolute terms, of a covenant-based variable is that of coverage, at 22.24%.

[27] As Appendix A shows, leverage is defined as the inverse of the ratio of total debt to four-quarter rolling earnings before interest, taxes, depreciation and amortization (EBITDA). We use the inverse of this ratio so that increases in this variable are positive for lenders regardless of whether EBITDA is positive or not.

with more tangible assets reduce lenders' losses; hence, we expect a negative relation between tangibility and return. Roberts and Sufi (2009) show that borrowers' options to obtain alternative sources of financing play an important role in the definition of credit contracts. To take into account these outside options, we also use the linearization of Lamont et al. (2001) of the Kaplan–Zingales (1997) index to control for the effect of firms' financial constraints. In addition, we include a (0, 1) indicator variable to capture whether a loan path is held by a firm that files for bankruptcy.

With respect to credit line characteristics, we control for the commitment amount and the maturity stated in the credit contract and for whether lines can be used for corporate restructuring, are provided by a syndicate of lenders, and are secured. As Santos (2011) points out, facilities with larger commitments or longer maturities may face more credit risk but are more likely to be granted to high-quality firms. Hence, the relations between the commitment amount and maturity to return are ambiguous. The relation between the indicator variable for whether facilities are secured and return is also ambiguous: Although secured facilities are safer, lenders are more likely to require a facility to be secured if the borrower is not of sufficient quality (Berger and Udell 1990). Credit lines used for corporate restructuring are expected to be used more heavily and, therefore, this type of credit line is expected to generate higher returns. If a credit facility is syndicated, we expect risk and, hence, return to be lower. This prediction is consistent with larger syndicates palliating the moral hazard problem present in the lender–borrower relationship (Bolton and Scharfstein 1996, Chava and Roberts 1998).

Additionally, we include (0, 1) indicator variables denoting for whether lines include commitment, annual, utilization, and upfront fees. A (0, 1) indicator variable is also used to control for financial covenant violations. Given that covenant breaches are damaging for lenders and, if no waiver is given, they imply higher borrowing costs, we expect a positive relation between this dummy variable and return. Finally, since having or not having outstanding borrowings can make a substantial difference on returns and outstanding borrowings are zero for about half of the observations, we control for whether drawdowns are nonzero.

5.2. Results

As with other debt instruments, a revolving line of credit is a source of risk for the lender. During the period in which the facility is outstanding and, therefore, the lender grants an amount of credit that can be used and reused, the borrower can have incentives to engage in asset substitution and, thus, to expropriate lender wealth (Jensen and Meckling 1976). Along with other provisions included in the credit agreement, such as covenants, the return resulting from the pricing scheme and usage can help compensate for such potential expropriation. In this regard, financial covenants protect the lender in a binary way, that is, if the borrower's performance triggers a covenant and no waiver is granted, then control rights revert to the lender (Aghion and Bolton 1992, Chava and Roberts 2008). However, returns can compensate for increases in borrower risk before covenant thresholds are reached. Moreover, since applicable rates and fees usually increase under technical default, returns can still play a compensating role in this situation (Asquith et al. 2005).

If returns satisfy a risk-compensating role and, hence, help align lenders' risk and rewards, we expect a trade-off between risk and return. Table 4 presents the estimation results of our investigation into this hypothesis. Column (1) refers to the base model, where the dependent variable is the return yielded by the applicable spreads and fees. Our results indicate that the credit facilities of riskier borrowers yield higher returns, that is, there seems to be a trade-off between risk and return in the market for revolving credit lines. Therefore, the empirical examination appears to be consistent with the hypothesis that the return on revolving facilities contributes to mitigating the effects of wealth expropriation by lenders. Indeed, firm risk seems to have a strong positive effect on returns. The coefficient estimate of risk in column (1) (6.854) suggests that a standard deviation increase in risk (0.023) at the mean leads to an increase in quarterly return by 12.80%, from 1.09% to 1.25%.

According to the analysis of Asarnow and Marker (1995), no risk–return trade-off is present in the market for revolving facilities. Indeed, the risk–return relation appears to be inverted, with the facilities of riskier and less risky firms yielding lower and higher returns, respectively. The difference between the outcomes of Asarnow and Marker (1995) and ours could result from the technical restrictions that the lack of data on actual credit line pricing and usage imposes on their analysis.

Columns (2) and (3) in Table 4 refer to empirical specifications in which the dependent variables are the AISD and AISU returns, respectively. Regarding the former, the risk–return trade-off seems to also be observed. Indeed, the effect of risk over the return component associated with facility usage appears to be greater than for the whole return: A one standard deviation increase in risk raises AISD return at the mean by 24.41%.

The AISU return results from the amount a borrower pays for each dollar available under a commitment; that is, it captures the return for the facility being usable. Thus, it is also a return for the risk arising from the borrower increasing usage as its creditworthiness deteriorates (Berg et al. 2016). Accordingly, the fact that our results indicate no statistically significant relation between this component of return and corporate risk suggests that the market for lines of credit could be mispricing such risk. This finding is indeed in line with Asarnow and Marker (1995), who also obtain evidence suggesting that revolving facilities underprice the risk of increased usage as corporate credit quality worsens.

[Table 4]

Overall, there do not appear to be any inconsistencies among our priors and the estimated coefficients of the control variables. Regarding firm-specific controls, Table 4 suggests a number of stylized facts. First, as expected, the current ratio and tangibility reduce returns. In particular, a one standard deviation increase in these variables reduces mean returns by 37.21% and 10.06%, respectively. Second, profitability decreases the AISD return and increases the AISU return. The reason for these findings is that more profitable firms use their facilities less than less profitable firms do but face lower spreads and similar commitment fees. Hence, given that the income yielded by these spreads and fees is the main component of AISD and AISU returns, respectively, these returns are negatively and positively related to profitability, respectively.[28] Third, the effect of capital expenditures on the AISU return is decreasing in capital expenditures. As with profitability, this negative relation seems to result from capital expenditures requiring a high level of credit line usage and, hence, decreasing the amounts charged for commitment fees. Fourth, the negative effects of the current ratio and tangibility on return are also found when the latter is split into its AISD and AISU components. Fifth, being the loan path of a defaulting firm reduces the AISU return by 0.263%. Since increasing usage, ceteris paribus, diminishes this

[28] Note, in this regard, that, first, the larger parts of the AISD and AISU returns result from the income generated by interest rate spreads and commitment fees, respectively. Such incomes equal, on average, $0.21 million and $0.11 million per quarter, respectively, whereas the incomes yielded by annual, utilization, and upfront fees are $0.04 million, $0.002 million, and $0.02 million, respectively. Second, the average spread of the sample lines held by firms below the median of the profitability distribution is higher than that of the sample lines entered by firms above this median (188.92 bps and 149.66 bps, respectively), and the mean commitment fees of these two groups of facilities are almost the same (35.25 bps and 35.90 bps, respectively). Third, for facilities held below and above the median of the profitability distribution, the unused portions of total commitments are 60.31% and 69.97%, respectively. This latter finding is indeed consistent with the results of Sufi (2009), who points out that the fraction of liquidity available to a firm in the form of lines of credit increases with profitability.

return, such an outcome is consistent with prior empirical results that have found that usage is higher for defaulting firms (Jimenez et al. 2009b, Zhao et al. 2014).

In relation to facility controls, maturity and returns appear to be negatively related. Following Santos (2011), this outcome suggests that longer maturities are granted to more creditworthy firms. In addition, being a secured facility has a positive effect on the AISU return.

Regarding fees, returns rise if the pricing scheme includes both annual and commitment fees, whereas they seem unaffected by utilization and upfront fees. Two additional outcomes are relevant. First, although commitment fees are not used to define the AISD return, they have a positive effect on it. This positive relation is consistent with multiple-fee pricing schemes being a self-selecting device of borrowers. As Thakor and Udell (1987) show, a borrower with a high takedown probability is willing to self-select into a contract with a commitment fee, which are charged on the unused portion of the commitment. In this sense, the usage-to-commitment ratio is higher for sample facilities with a commitment fee (25.25% vs. 17.43%). This higher usage of facilities leads to a higher AISD return, and explains, therefore, the positive effect of commitment fees on this return. Second, the AISU return increases in the fees included in its definition, whereas it decreases in the utilization fee.[29]

As a consequence of the widespread use of contract provisions that increase spreads in the case of covenant violation, technical default increases both the total and AISD returns. Having nonzero outstanding borrowings increases returns but has different effects on the AISD and AISU returns: In tune with their raison d'être, not using a facility increases the former and decreases the latter.

The 2008 crisis did not seem to modify returns, although our results suggest that it diminished AISU returns. This reduction can be explained as the effect of the significant increase in credit line usage during the crisis, as previously documented by Ivashina and Scharfstein (2010). In our sample, the usage-to-commitment ratios in the crisis and non-crisis periods are 29.24% and 21.14%, respectively. The sign of the time trend in column (1) of Table 4 reflects that returns tend to increase in the sample period. The average growth per quarter is, however, just 1.7 bps.

[29] In contrast with the effect of commitment fees on the AISD return and, despite the screening role of pricing schemes, we do not observe a negative relation between commitment fees and the AISU return. The reason is that these fees are the main source of such returns.

5.3. Robustness checks

To check for the robustness of our results regarding the risk-compensating role of returns in the market for revolving facilities, we perform a series of additional analyses. The main estimated coefficients of these tests are displayed in Table 5.[30]

[Table 5]

Credit agreements establish that interest rate spreads and fees are reset on a quarterly basis and, therefore, the three-month period previous to each reset has been used in the base model to analyze the risk–return trade-off. However, we repeat our estimation using a 12-month period to calculate the standard deviation of firms' daily stock returns. In the second and third robustness checks, we use Altman's (1968) Z-score and Ohlson's (1980) O-score to capture the probability of default. Since the Z-score is an inverse measure of financial distress, its relation to return is expected to be negative. To obtain estimated coefficients in row (4) of Table 5, we do not compute firm-specific control variables using annualized flow variables. By contrast, following Roberts and Sufi (2009), we use the quarterly values of flow and stock variables and take the four-quarter average for each control; that is, the value of a control variable in quarter t equals the average of this variable from $t-3$ to t, inclusively. The results in rows (5) and (6) are based on alternative methods to amortize upfront fees. In the row (5), the quarterly amortized amount is equal to the upfront fee divided by the number of quarters between the quarter in which the contract (either the original contract or the amendment including the fee) is settled and the earliest quarter between the quarter corresponding to the maturity date of the contract and the quarter in which the loan path of the facility terminates. In the row (6), upfront fees are amortized just while the credit contracts establishing them are not amended or terminated. To compute the returns upon which the results in row (7) are based, we use 14 months as the maturity threshold that divides facilities into those that do not have to hold capital for the unused portion of the commitment and those that do. In row (8), no maturity threshold is used to compute the returns.

Systematic risk itself could be a concern for lenders, since a high level of this type of risk increases the probability of default on the line of credit when the entire market is in trouble and lenders, therefore, are also likely to become in financial distress. If these concerns influence the contractual pricing scheme, corporate systematic risk could affect returns and, hence, alter our

[30] Complete results are available upon request.

results. To control for these potential effects, we include in the base model the beta coefficient that, according to the capital asset pricing model, is obtained by regressing corporate excess returns on market excess returns. We proxy for the risk-free rate with the three-month Treasury bill rate and the market portfolio, in tune with the $20 billion threshold established on sample firm size by the MidCap 400 index. Row (9) of Table 5 displays the results.[31]

The 2007 financial crisis, which is part of the sample period, was an extraordinary time for financial intermediation. Indeed, the relation between risk and return had likely changed by 2007 and continued to evolve throughout the crisis, making perceived risks more important and identifiable. Accordingly, the relation between risk and return could change across periods; that is, the risk-compensating role of returns could be present only for certain periods and, in particular, could have faded once the crisis was over. To control for the potential effects of the recession over the risk–return relation, the base model includes a (0, 1) indicator variable for the crisis. Nevertheless, to obtain more robust evidence that the positive relation between risk and return is present throughout the whole sample period and, in particular, does not vanish after the end of the crisis, we split the sample into subperiods. In particular, we use the end of the crisis, 2009:Q2, to distinguish between 2006:Q1–2009:Q2 and 2009:Q3–2012:Q2. Rows (10) and (11) of Table 5 display the results for these periods.

Despite their widespread use, Compustat data raise concerns over the possibility of results biased by this database dropping failed, acquired, or delisted firms and, hence, keeping only survivor firms (e.g., Boyd et al. 1993). Although we cannot completely rule out that the analysis is not biased by this survivor effect, we check whether we can expect this potential bias to not alter our results significantly. With this aim, we test whether the positive relation between risk and return is also observed for the riskiest sample firms, which are more likely to be dropped from Compustat and, therefore, to give rise to the survivor bias. We define this set of firms as those whose mean standard deviation of stock returns is above the median of all sample firms. In rows (12) and (13) of Table 5, these means and medians are calculated taking into account the whole sample and the 2007 crisis periods, respectively.

Overall, the results from the base model are not qualitatively different from the robustness test results displayed in Table 5. There is just one relevant difference: Row (2) shows that, if risk

[31] We have also checked that our results are not qualitatively different if the market portfolio is identified as either the S&P 500 or SmallCap 600 indexes. The results are available upon request.

is captured by the Z-score, the AISU return increases in risk. This outcome questions a conclusion suggested by the base model and our univariate analysis; specifically, it questions whether the risk of facing higher drawdowns as corporate quality deteriorates is inadequately compensated. Nevertheless, the empirical specifications in which risk is proxied by the 12-month standard deviation of firms' daily stock returns and the O-score support this conclusion. As row (9) indicates, the risk-compensating role of returns is not qualitatively modified if we control for corporate systematic risk. Additionally, the beta coefficient is not statistically significant. Regarding potential changes in the risk–return relation before and after the end of the financial crisis, the coefficients of risk are significant and positive for both 2006:Q1–2009:Q2 and 2009:Q3–2012:Q2. The values of these coefficients (5.284 vs. 8.012) suggest that the effect of an increase in risk over the mean return is greater after the crisis, but a Wald test indicates that we cannot reject the hypothesis that the coefficients are equal (*p*-value = 0.456). According to rows (12) and (13), the risk-compensating role of returns appears to also be observed for the set of high-risk firms. Therefore, despite the use of Compustat data raising relevant concerns about survivor bias, we do not expect this potential problem to significantly affect our results.

6. Renegotiation effects

Credit contracts are inherently incomplete (Aghion and Bolton 1992). Hence, some contractual provisions will likely not be finely adapted to future, unforeseen events. In particular, if a facility's holder becomes riskier, the pricing structure and usage of the facility may not yield a return adequate to the new level of risk.

As Roberts (2015) points out, the incompleteness of contracts is mitigated by renegotiation throughout the whole lending relation and risk, as captured by the borrower's stock return volatility, seems to be a key determinant of the timing of renegotiation. These findings are consistent with those of Gorton and Khan (2000), who show that, once the lender receives negative information about the borrower's prospects, the status quo is never optimal; that is, the best option for the lender is to renegotiate to obtain more advantageous terms. Thus, renegotiation can help align the lender's risk and rewards. Accordingly, we expect that a credit contract subject to active renegotiation reinforces, on average, the risk-compensating role of returns.

To check this hypothesis, we introduce into the base model a variable that measures renegotiation intensity and an interaction term between this variable and risk. Renegotiation intensity is captured by the average duration-to-maturity ratio. To compute this ratio, we calculate the ratios of the actual duration of the contracts to their contractual maturity for all the contracts in a sample loan path (including the credit contract that starts the loan path and its amendment) and we then average out these ratios.[32] Defining renegotiation intensity thus allows us, first, to obtain a measure that is based on the nature of the relationship that lenders and borrowers establish throughout the whole life of loan paths; that is, our measure reflects whether this relationship is active or not beyond any particular contract of a loan path. Second, our definition of renegotiation intensity captures the relation between what the contracting parties agreed upon according to their information and expectations when the contract was originated or amended and what these parties eventually do.[33]

The higher the average duration-to-maturity ratio, the less active the lender–borrower relationship; specifically, if the average ratio is close to one, contractual maturities and actual durations tend to be the same, whereas, if it is close to zero, durations tend to be short in relation to maturities. Accordingly, we expect the estimated coefficient of the interaction coefficient between renegotiation intensity and risk to be negative. Table 6 shows the main estimated coefficients of our analysis for renegotiation and the risk–return trade-off.[34]

[Table 6]

The estimated coefficient of the interaction term between renegotiation intensity and risk in column (1) is, as expected, negative. Therefore, an increase in borrower risk seems to have a weaker effect on return if the lender–borrower relationship is not too active in terms of renegotiation. Moreover, if contracts in a loan path tend to terminate on their maturity dates and, hence, the average duration-to-maturity ratio is close enough to one, the risk–return relation is reversed: Increases in risk reduce return. To illustrate the magnitude of the effect, consider two facilities that differ in whether they have low or high renegotiation intensity; specifically, they

[32] To compute the average duration-to-maturity ratio, we do not take into account censored facilities, that is, contracts that are still outstanding at the end of the sample period or which are held by a firm that drops from the sample while the facility is outstanding. However, the average duration-to-maturity ratio of these censored facilities is the same as that of any other facility in the same loan path.
[33] Although our notion of renegotiation intensity relates to Nikolaev's (2016), who defines it as the time between two contracts, the author's definition does not take into account the nature of the lender–borrower relationship throughout the loan path and is based on the absolute value of the actual duration length.
[34] Complete results are available upon request.

have a mean renegotiation intensity (0.548) plus and minus this variable's standard deviation (0.233), respectively. An increase in risk equal to one standard deviation (0.023) increases the average return by 3.20% or 24.78% if renegotiation intensity is low or high, respectively.

To check for the robustness of the effect of renegotiation on the risk–return trade-off, we perform additional tests. Previous works have examined whether the need for renegotiation is diminished by pricing grids, that is, contractual contingencies that tie spreads and fees to borrower performance (Beatty et al. 2002, Asquith et al. 2005, Ivanov 2012, Roberts 2015). To control for the potential effect of this type of pricing scheme, our first test introduces a (0, 1) indicator variable that is equal to one if the credit contract includes a pricing grid. In the second test, we also introduce an interaction term between this variable and risk. Thus, we can check whether pricing grids, as a complement to renegotiation, modify the risk–return trade-off; specifically, we can test whether this type of pricing scheme also helps to reinforce the risk-compensating role of return. In the fourth test, we include two variables that stand for the durations of the loan paths and facilities. The reason for controlling for loan path duration is that a given renegotiation intensity can be qualitatively different if the loan path extends through a long or short period. We include facility duration to control for situations in which, for instance, the renegotiation intensity is low (i.e., close to one), because the loan path is formed by a set of short-term facilities whose maturities are extended through amendments that are agreed upon close to the termination dates. Although not displayed in Table 6, the results do not change if we control for just one of the durations, that of either the loan paths or the facilities. The fifth test defines renegotiation intensity as the ratio of the number of sample contracts in a loan path to the duration of the loan path.[35] A higher ratio stands for a more active lender–borrower relationship and, therefore, we predict the coefficient of the interaction term between such a ratio and risk to be positive. The outcomes of the fifth test in column (5) include the variables that control for the durations of the facilities and loan paths; however, the main results do not change significantly if these variables are not included in the empirical exercise or if just one of them is taken into account. The sixth and seventh tests exclude from the analysis facilities with a maturity shorter than one year and censored facilities, respectively.

[35] The duration of the loan path starts with the earliest contract in the sample. If the last contract of the loan path is a censored facility, the numerator of the variable measuring renegotiation activity is the number of contracts in the loan path minus one and the denominator is the number of quarters between the origination of the first sample contract of the loan path and the origination of that censored facility. If the loan path just has one contract and the latter is still outstanding at the end of the sample period, we assume that June 30, 2012, is the end of the loan path.

According to the results shown in Table 6, none of these tests seems to qualitatively change the effect that renegotiation appears to have on the risk–return trade-off. As expected, in all the columns where renegotiation intensity is measured by the average duration-to-maturity ratio, the estimated coefficient of the interaction term between this ratio and risk is negative. In column (5), where renegotiation intensity is proxied by the ratio of the number of contracts in a loan path to its duration, the coefficient of the interaction term between this way of capturing renegotiation intensity and risk is, also as expected, positive. However, unlike in the base model, the coefficient of risk is not significant in column (5), which suggests that the effect of risk on return is completely determined by the level of renegotiation intensity when the latter is measured by the ratio of the number of contracts in a loan path to its duration. This ratio has a similar effect on the risk–return trade-off to that of the average duration-to-maturity ratio. In this regard, a one standard deviation increase of risk raises the average return by 5.28% and 29.44% if the renegotiation intensity is equal to the mean of the ratio of the number of contracts in a loan path to its duration (0.057) minus and plus the standard deviation of this ratio (0.040), respectively. In addition, as columns (4) and (5) of Table 6 suggest, the variables that control for the duration of facilities and loan paths are statistically insignificant.

Column (3) of Table 6 indicates that the coefficient of the interaction term between risk and the variable capturing the inclusion of pricing grids in credit contracts is not statistically significant. Therefore, although previous empirical research has shown that pricing grids can help alleviate re-contracting costs (Asquith et al. 2005) or can delay renegotiation as credit quality improves (Ivanov 2012), our results suggest that performance pricing and renegotiation have asymmetric effects on the risk–return trade-off. Specifically, pricing grids do not appear to have any effect on the risk-compensating role of returns. This outcome can be explained by the interaction among usage, pricing, and returns. If credit quality is deteriorating, pricing grids increase spreads and fees almost mechanically and, thus, raise the payoff per dollar drawn down. However, since higher prices can reduce usage, pricing grids do not necessarily provide a higher return when risk increases (Jones and Wu 2015). In addition, previous works have questioned whether the main rationale for the widespread use of performance pricing is that it helps align the contractual parties' risks and rewards. In this sense, Bhanot and Mello (2006) and Manso et al. (2010) show that, if creditworthiness is worsening, performance pricing can force the borrower into bankruptcy more often or earlier. Increasing the coupon, therefore, may not be the best option when risk is increasing (Gorton and Khan 2000).

7. Conclusion

Committed revolving lines of credit are a dominant form of corporate financing. A positive relation between risk and return in this market would be consistent with the hypothesis that the return on facilities can help compensate for the expropriation of lender wealth driven by moral hazard. Nevertheless, only Asarnow and Marker (1995) have studied such a trade-off, more than two decades ago. We follow the path that their classical work opened. Specifically, besides performing a univariate analysis similar to that of Asarnow and Marker (1995), we provide the first multivariate analysis of how borrower risk relates to lenders' returns on revolving facilities.

Our research is highly demanding in terms of data. Indeed, we use data from five commercial databases, two linking databases, and a manually gathered dataset providing information not covered or insufficiently covered by commercial databases. To make manual data collection possible, we focus on firms that are comparable in terms of size to mid- and small-cap ones.

Overall, our findings support the hypothesis that returns on lines of credit play a risk-compensating role that helps palliate the potential lender wealth expropriation that asset substitution can cause. However, no relation seems to exist between risk and the AISU return. This outcome implies that the market for credit lines may be underpricing the risk of quality-deteriorating borrowers increasing their drawdowns on lines of credit. This paper also suggests that renegotiation is a means to help align lenders' risk and rewards. Specifically, if the lender–borrower relation is intense in terms of renegotiation activity, the risk-compensating role of return is enhanced. Indeed, if the renegotiation intensity is low enough, the risk–return can even be reversed.

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Appendix A

Table A1. Variable definitions

This table presents the definitions of the variables used in our analysis. Variables from Compustat are in bold and those from the CRSP in bold italics.

Return	Return	(Income from spread charged on drawdowns and from annual, commitment, utilization and upfront fees, less the LGD)/(Outstanding borrowings + 0.5 * Unused portion of the commitment)
	AISD return	(Income from spread charged on drawdowns and from annual, utilization and upfront fees, less the corresponding LGD)/(Outstanding borrowings + 0.5 * Unused portion of the commitment)
	AISU return	(Income from annual, commitment and upfront fees, less the corresponding LGD)/(Outstanding borrowings + 0.5 * Unused portion of the commitment)
All-in spreads	AISD	Spread over LIBOR loans[a] + Annual fee + Utilization fee
	AISU	Commitment fee + Annual fee
Risk	Equity volatility	Three-month standard deviation of ***ret***, that is, of the firm's daily stock return
	Z-Score	1.2 * ((**actq** - **lctq**)/**atq**) + 1.4 * (**req**/**atq**) + 3.3 * (Four-quarter rolling **piq**/**atq**) + 0.6 * (Four-quarter moving average (**prccq** * **cshoq**))/**ltq**) + 0.999 * (Four-quarter rolling **saleq**/**atq**)
	O-Score	O-score = -1.32 - 0.407 * (log((atq/Deflator) * 100)) + 6.03 * (ltq/atq) - 1.43 * ((actq - lctq)/atq) + 0.076 * (lctq/actq) - 1.72 * X1 - 2.37 * (niq/atq) - 1.83 * ((piq + dpq)/ltq) + 0.285 * X2 - 0.521 * (niq – niq_{t-1})/(|niq| + |niq_{t-1}|), where Deflator = quarterly, seasonally adjusted, implicit price deflator, as reported by the Federal Reserve of St. Louis; X1 = 1 if ltq ≥ atq and X1 = 0 otherwise; X2 = 1 if (niq + niq_{t-1} + niq_{t-2} + niq_{t-3}) < 0 or (niq_{t-4} + niq_{t-5} + niq_{t-6} + niq_{t-7}) < 0 and X2 = 0 otherwise.
Firm characteristics	Leverage	1/((**dlcq** + **dlttq**)/Four-quarter rolling **oibdpq**)
	Coverage	Four-quarter rolling **oibdpq**/Four-quarter rolling **xintq**
	Capital expenditures	Four-quarter rolling **capxq**/**atq**
	Net worth	**atq** – **ltq**
	Current ratio	**actq**/**lctq**
	Profitability	Four-quarter rolling **oibdpq**/Four-quarter rolling **saleq**
	Size	Log of four-quarter rolling **saleq**
	Market-to-book ratio	(**atq** - (**atq** - **ltq** - **pstkl** + **txditcq**) + Four-quarter moving average (**prccq** * **cshoq**))/**atq**
	Tangibility	**ppentq**/**atq**
	Beta	Estimated coefficient of market excess returns resulting from regressing corporate excess returns on former returns
	Kaplan–	-1.001909 * ((Four-quarter rolling **ibq** + Four-quarter rolling **dpq**)/Four-quarter

[a] Or spread over ABR loans, if available, and the credit line does not allow LIBOR loans.

	Zingales index	lagged **ppentq**) + 0.2826389 * (**atq** - **ceqq** - **txditcq** + Four quarter moving average (**prccq** * **cshoq**))/**atq** + 3.139193 * ((**dlcq** + **dlttq**)/(**dlcq** + **dlttq** + **seqq**)) - 39.3678 * (Four-quarter rolling **dvq**/Four-quarter lagged **ppentq**) - 1.314759 * (**cheq**/One-quarter lagged **ppentq**)
	Default	1 for the loan paths outstanding when a firm files for bankruptcy and 0 otherwise
Facility characteristics	Secured	1 if the facility is secured and 0 otherwise
	Syndicated	1 if the credit line is provided by a syndicate of lenders and 0 otherwise
	Maturity	Log of the facility maturity specified in the credit contract
	Amount	Log of the amount committed under the facility
	Purpose	1 if the facility can be used for corporate restructuring, that is, leveraged buyouts, mergers and acquisitions, and stock repurchases, and 0 otherwise
	Nonzero outst. borrowings	1 if the facility has positive outstanding borrowings and 0 otherwise
	Technical default	1 if the financial covenants of the facility are breached by the borrower and 0 otherwise
	Pricing grid	1 if the facility has a pricing grid and 0 otherwise
Fees	Annual fee	1 if the facility includes a fee charged on the entire commitment amount, regardless of usage, and 0 otherwise
	Commitment fee	1 if the facility includes a fee charged on the unused amount of the commitment and 0 otherwise
	Utilization fee	1 if the facility includes a fee charged on the drawn amounts if and while a usage threshold is exceeded and 0 otherwise
	Upfront fee	1 if the facility includes a single charge fee paid at origination and 0 otherwise
Other	Crisis	1 if the quarter is between 2007:Q4 and 2009:Q2, inclusively, and 0 otherwise
	Trend	Linear time trend
Renegotiation intensity	Base version	Average of the ratios of the actual duration to the stated maturity of the contracts in a loan path
	Alternate version	Ratio of the number of contracts in a loan path to its duration

Appendix B

Table B1. Pricing criteria

This table presents the pricing criteria that, according to credit line contracts, are used to calculate variable spreads and fees. The column *Type* broadly classifies the pricing criteria. Based on this classification, the column *Id.* provides an identification of each pricing criterion. The column *Definition* describes how pricing criteria are calculated in terms of variables from Compustat (in bold), DealScan (in italics), Capital IQ (underlined), and Datastream (in underlined italics), or variables based on manually gathered data (plain text). The column *Credit lines* indicates the number and percentage (over the total number of facilities with pricing grids) of the sample lines per pricing criterion. The variables based on manually gathered data are defined as follows: borr, outstanding borrowings on a credit line; borrbase, the dollar value of a credit line's borrowing base; lc, the dollar value of outstanding letters of credit under a credit line; lecrq, the dollar value of a firm's total amount of outstanding letters of credit; and unusedav, a credit line's unused available amount.

Technical notes: (1) If the SEC filings do not mention a credit line's unused available amount for a quarter, we calculate it as borrbase – borr – lc or, if the credit line does not have a program to support the issuance of letters of credit, as borrbase – borr. If the credit line does not have a borrowing base or borrbase is missing, we use *facilityamt* – borr – lc or *facilityamt* – borr. (2) If the SEC filings do not provide information about letters of credit outstanding under a facility but this information is required to calculate a pricing criterion, we assume that lc is zero. (3) The income statement variables are measured on a four-quarter rolling basis. (4) To obtain the quarterly values of firms' rent expenses, we generate the variable **xrentq**, which is equal to Compustat's annual variable **xrent** divided by four. (5) Following Demerjian and Owens (2016), we use four-quarter lagged debt in current liabilities ($\mathbf{dlcq}_{t-4}$) as a proxy of senior debt payments during the past year. (6) Quarterly values for capital expenditures (**capxq**) and dividend payments (**dvq**) are obtained from the year-to-date cash flow statement data. (7) If the Capital IQ variable for senior debt (totsrdbt) is missing, we assume that the Compustat annual variable for subordinated debt (**ds**) remains constant during the fiscal year and we calculate quarterly senior debt as the difference between total debt and the latter variable (**dlcq** + **dlttq** - **ds**). We do not use the Capital IQ variable for subordinated debt (totsubdbt) due to the large number of missing values. If senior secured debt (totsrsecureddbt) or secured debt (secureddbt) is required to calculate a pricing criterion but is missing from the Capital IQ data, we use the Compustat variable for mortgage and other secured debt (**dm**).

Type	Id.	Definition	Credit lines	
			Number	**Percent.**
Availability	A1	unusedav	22	5.55%
Adjusted availability	B1	unusedav+**cheq**	3	0.75%
	B2	unusedav-2.5	1	0.25%
	B3	unusedav-3.5	1	0.25%
Availability-to-borrowing base ratio	C1	unusedav/borrbase	1	0.25%
Availability-to-facility amount ratio	D1	unusedav/*facilityamt*	1	0.25%
Usage	E1	borr+lc	3	0.75%
	E2	borr	2	0.50%
Usage-to-borrowing base ratio	F1	(borr+lc)/borrbase	17	4.26%
Usage-to-facility amount ratio	G1	(borr+lc)/*facilityamt*	12	3.01%
	G2	borr/*facilityamt*	1	0.25%
Debt-to-EBITDA ratio	H1	(**dlcq**+**dlttq**)/**oibdpq**	175	43.86%
Adjusted debt-to-EBITDA ratio	I1	(**dlcq**+**dlttq**-**chq**)/**oibdpq**	2	0.50%
	I2	(**dlcq**+**dlttq**-**cheq**)/**oibdpq**	2	0.50%
	I3	(**dlcq**+**dlttq**-lecredq-**chq**)/**oibdpq**	3	0.75%
	I4	(**dlcq**+**dlttq**+lecredq-**cheq**)/**oibdpq**	2	0.50%
	I5	(**dlcq**+**dlttq**-(**chq**-25)/**oibdpq**	3	0.75%
	I6	(**dlcq**+**dlttq**-(**cheq**-30)/**oibdpq**	2	0.50%
	I7	(**dlcq**+**dlttq**-(**cheq**-100)/**oibdpq**	1	0.25%
	I8	(**dlcq**+**dlttq**-min{5,**chq**})/**oibdpq**	1	0.25%
	I9	(**dlcq**+**dlttq**-min{80,**chq**})/**oibdpq**	3	0.75%
	I10	(**dlcq**+**dlttq**-min{35,**cheq**})/**oibdpq**	2	0.50%
	I11	(**dlcq**+**dlttq**-min{100,**cheq**})/**oibdpq**	1	0.25%
	I12	(**dlcq**+**dlttq**-min{150,**cheq**-50})/**oibdpq**	7	1.75%
Debt-to-capitalization ratio	J1	(**dlcq**+**dlttq**)/(**dlcq**+**dlttq**+**atq**-**intanq**-**ltq**)	5	1.25%
	J2	(**dlcq**+**dlttq**)/(**atq**+**dlcq**+**dlttq** -**ltq**)	4	0.75%
	J3	(**dlcq**+**dlttq**-max{0,**chq**-10})/(**atq**-**intanq**-**ltq**)	2	0.50%
	J4	(**dlcq**+**dlttq**-max{0,**cheq**-10})/(**atq**-**intanq**-**ltq**)	1	0.25%
Senior debt-to-EBITDA ratio	K1	totsrdbt/**oibdpq**	11	2.76%
Senior debt-to-capitalization ratio	L1	totsrdbt/(**atq**-**intanq**-**ltq**+(**dlcq**+**dlttq**-totsrdbt))	1	0.25%
Senior secured debt-to-EBITDA ratio	M1	totsrsecureddbt/**oibdpq**	2	0.50%
Adjusted senior secured debt-to-EBITDA ratio	N1	(totsrsecureddbt-**cheq**)/**oibdpq**	1	0.25%
Adjusted secured debt-to-EBITDA ratio	O1	(secureddbt-borr+((borr+borr_{t-1}++borr_{t-1}++borr_{t-1})/4))/**oibdpq**	3	0.75%
Adjusted debt-to-EBITDAR ratio	P1	(8***xrentq**+lecrq+**dlcq**+**dlttq**)/(**oibdpq**+**xrentq**)	2	0.50%
	P2	(8***xrentq**+**dlcq**+**dlttq**)/(**oibdpq**+**xrentq**)	2	0.50%
	P3	(7***xrentq**+**dlcq**+**dlttq**)/(**oibdpq**+**xrentq**)	1	0.25%

	P4	(7***xrentq**+lecrq+**dlcq**+**dlttq**)/(**oibdpq**+**xrentq**)	5	1.25%
Liabilities-to-capitalization ratio	Q1	**ltq**/(**atq-intanq-ltq**)	2	0.50%
Adjusted liabilities-to-EBITDA ratio	R1	(**ltq-apq-xacc-drltq**)/(**oibdpq**)	1	0.25%
Fixed charge coverage ratio	S1	(**piq-capxq**)/**dlcq**$_{t-4}$	2	0.50%
	S2	(**oibdpq**+**xrentq-capxq**)/(**xrentq**+**xintq**)	1	0.25%
	S3	(**oibdpq**+**xrentq**)/(**xrentq**+**xintq**)	1	0.25%
	S4	(**piq-capxq-dvq**)/(**dlcq**$_{t-4}$+**xintq**)	1	0.25%
	S5	**oibdpq**/**xintq**	1	0.25%
	S6	(**oibdpq**+**xrentq-txtq-capxq-dvq**)/(**dlcq**-borr+**xrentq**+**xintq**)	1	0.25%
	S7	(**oibdpq**+**xrentq**)/(**dlcq**$_{t-4}$+**xrentq**+**xintq**)	3	0.75%
EBITDA	T1	**oibdpq**	4	1.00%
Equity-to-assets ratio	U1	**seqq**/**atq**	1	0.25%
Rating	V1	End-of-quarter **splticrm**	90	22.56%
Credit default swap spread	W1	*xr 5y $ - cds prem. mid*	1	0.25%
Time elapsed since origination	X1	Time elapsed since origination	4	1.00%

Table B2. Credit lines with spreads or fees defined by more than one criterion

This table describes situations in which more than a single criterion determines the applicable spreads or fees. The criteria are identified according to column *Id.* in Table B1.

Criteria	**Credit lines**	
	Number	**Percentage**
E1 & V1	1	0.25%
G1 & V1	6	1.50%
G2 & V1	1	0.25%
H1 & V1	6	1.50%
W1 & V1	1	0.25%
A1, E2 & X1	4	1.00%
A1, T1 & X1	1	0.25%

Appendix C

Table C1. Credit line purposes according to credit line contracts

This table presents the purposes for which borrowings from sample facilities can be used according to credit contracts. The columns show the possible purposes. An X indicates that the type of credit line allows borrowers to use drawdowns for the purpose denoted in the corresponding column. The last column shows the number of sample credit lines by type. Support for letters of credit and payments of fees and expenses associated with credit lines are not included as purposes. Cash management exposure is included in working capital or corporate purposes. The data were obtained from the credit contracts of sample credit lines.

Types	Work. cap. or corp. purposes	Debt repaym.	Mergers and acquis.	Capital expend.	Stock buyback	Specific event	Joint ventures	Specific event	Purch. convert. notes	Foreign exch.	Total (over 496)
1	X										89 (17.94%)
2	X	X									81 (16.33%)
3	X	X	X								68 (13.71%)
4	X	X	X	X							32 (6.45%)
5	X	X	X	X	X						6

											(1.21%)
6	X	X	X	X		X					11 (2.22%)
7	X	X	X		X						9 (1.81%)
8	X	X		X							36 (7.26%)
9	X	X		X	X						3 (0.60%)
10	X	X		X	X		X				3 (0.60%)
11	X	X			X						5 (1.01%)
12	X	X				X					9 (1.81%)
13	X		X								45 (9.07%)
14	X		X	X							35 (7.06%)
15	X		X	X	X						4 (0.81%)
16	X		X		X						6 (1.21%)
17	X		X				X				3 (0.60%)
18	X		X		X		X				1 (0.20%)
19	X			X							26 (5.24%)
20	X			X	X						3 (0.60%)
21	X			X		X					2 (0.40%)
22	X							X			3 (0.60%)
23	X								X		2 (0.40%)
24	X									X	2 (0.40%)
25			X	X							1 (0.20%)

FIGURES

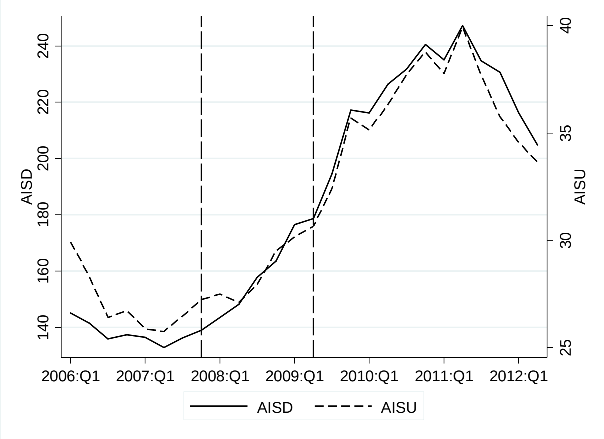

Figure 1. AISD and AISU. This figure represents the sample average AISD and AISU by quarter in 2006:Q1–2012:Q2. The AISD and AISU are measured on the left- and right-hand axes, respectively. The vertical dashed lines mark the start (2007:Q4) and end (2009:Q2) of the 2008 crisis according to the National Bureau of Economic Research (NBER). The AISD and AISU are defined in Appendix A.

TABLES

Table 1. Summary statistics: Revolving facility characteristics

This table presents summary statistics—means, standard errors (SE), and medians—on the facility characteristics for two datasets. The first (sample) is the dataset on which our analysis is based. The second dataset (DealScan) consists of all the revolving lines of credit in DealScan outstanding in the sample period, denominated in US dollars, and provided to non-financial US firms. Statistics on the purpose of the facilities in DealScan are not provided due to substantial differences between our variable and that of DealScan (see Appendix C). To calculate the statistics referring to our sample, we proceed as if there were one observation per facility. However, the statistics of technical default and nonzero outstanding borrowings are calculated over firms and the total number of observations, respectively. The variables are defined in Appendix A.

	Sample			DealScan		
	Mean	SE	Median	Mean	SE	Median
Secured line (1, 0)	0.63	0.48	1	0.79	0.41	1
Syndicated line (1, 0)	0.93	0.25	1	0.98	0.12	1
Maturity (months)	42.87	18.58	47	50.08	18.72	60
Principal ($mil.)	270.73	346.51	125	266.09	596.79	90
Purpose (1, 0)	0.47	0.50	0	-		
Technical default	0.17	0.38	0	-		
Nonzero outst. borrs. (1, 0)	0.52	0.50	1	-		
Credit lines	496			23,148		
Firms	122			10,191		

Table 2. Summary statistics: Firm characteristics

This table presents summary statistics—means, standard errors (SE), and medians—on the firm characteristics for two datasets. The first (sample) is the dataset on which our analysis is based. The second dataset (Compustat) consists of all firm–quarter observations from non-financial US firms appearing in Compustat between 2006:Q1 and 2012:Q2. The statistics of default are calculated as if there were one observation per firm. The variables are defined in Appendix A.

	Sample			Compustat		
	Mean	SE	Median	Mean	SE	Median
Risk	0.03	0.02	0.03	-		
Leverage	9.06	118.45	0.42	7.12	783.73	0.28
Coverage	47.79	364.64	7.32	18.73	1,588	4.45
Capital expend.	0.05	0.06	0.03	0.08	6.85	0.03

Net worth	925.57	1,453	335.29	1,111	5,669	97.73
Current ratio	1.95	1.30	1.68	4.20	78.05	1.80
Profitability	0.12	0.33	0.12	-9.55	272.38	0.10
Size ($ mil.)	2,269	4,127	837.71	2,471	12,286	215.26
Market to book ratio	1.64	0.97	1.32	25.40	603.00	1.59
Tangibility	0.30	0.24	0.22	0.26	0.26	0.15
Financial constraint	-2.52	22.38	0.08	-0.63	219,322	726.23
Default	0.04	0.20	0	-		
Line–quarter obs.	2,107			131,579		
Firms	122			7,031		

Table 3. Univariate analysis

This table presents the different types of mean annual returns of the credit lines for the whole sample and by risk category. The sample covers the period 2006:Q1–2012:Q2. The risk categories are the quintiles of the three-month standard deviation of the sample firms' daily stock returns. To compute the mean annual return for either the whole sample or each risk category, we calculate, first, the average returns of the sample facilities per quarter; second, the compound cumulative return; and, third, the geometric average of this cumulative return. The types of returns are defined in Appendix A.

Type	Quintiles of the st. dev. of daily stock returns					Total
	First	Second	Third	Fourth	Fifth	
Return (1)	0.85%	0.89%	1.06%	1.32%	1.53%	1.10%
AISD return (2)	0.56%	0.56%	0.66%	0.93%	1.20%	0.74%
AISU return (3)	0.44%	0.46%	0.52%	0.59%	0.55%	0.52%

Table 4. Risk-compensating role of returns

This table presents the results from regressions that analyze the risk-compensating role of returns in the market for credit lines. The sample covers the period 2006:Q1–2012:Q2. The data were obtained from DealScan, Compustat, Capital IQ, Datastream, the CRSP, SEC 10-K and 10-Q filings, and credit contracts. The columns differ in the dependent variable used, that is, the coupon return, the AISD return, and the AISU return. Risk is measured by the three-month standard deviation of sample firms' daily stock returns. The regressions include quarter, one-digit SIC industry, and firm credit rating (0, 1) indicator variables. Statistical significance at the 5% and 1% levels is denoted by * and **, respectively. All the regressions are conducted with standard errors robust to within-facility dependence and heteroscedasticity. The variables are defined in Appendix A.

	Return (1)	AISD return (2)	AISU return (3)
Intercept	1.922** (0.589)	1.874** (0.623)	1.321** (0.483)
Risk	6.854** (2.026)	7.689** (1.996)	0.319 (0.876)
Leverage	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)
Coverage	-0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)
Capital expenditures	-0.651 (0.671)	-0.117 (0.708)	-0.733* (0.289)
Net worth	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Current ratio	-0.227** (0.036)	-0.176** (0.040)	-0.090** (0.020)
Profitability	-0.147 (0.081)	-0.183* (0.091)	0.068* (0.027)
Size	0.025 (0.053)	0.011 (0.063)	0.040 (0.024)
Market-to-book ratio	-0.049 (0.033)	-0.070 (0.040)	0.024 (0.022)

Tangibility	-0.411* (0.166)	-0.341* (0.173)	-0.278* (0.123)
Financial constraint	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
Default	0.243 (0.329)	0.471 (0.337)	-0.263** (0.120)
Secured	0.153 (0.085)	0.117 (0.091)	0.166** (0.046)
Syndicated	-0.356 (0.191)	-0.325 (0.219)	-0.214 (0.110)
Maturity	-0.350** (0.128)	-0.381** (0.139)	-0.219* (0.097)
Amount	-0.080 (0.060)	-0.070 (0.069)	-0.039 (0.032)
Purpose	0.025 (0.063)	0.047 (0.064)	0.028 (0.042)
Annual fee	1.105** (0.199)	0.908** (0.194)	0.900** (0.130)
Commitment fee	1.181** (0.169)	0.579** (0.165)	0.782** (0.108)
Utilization fee	-0.141 (0.129)	-0.130 (0.151)	-0.226* (0.091)
Upfront fee	0.126 (0.093)	0.076 (0.097)	0.180** (0.062)
Technical default	0.425* (0.201)	0.459* (0.220)	-0.022 (0.070)
Nonzero outst. borrow.	0.595** (0.067)	0.927** (0.075)	-0.391** (0.042)
Crisis	-0.218 (0.129)	-0.157 (0.135)	-0.225* (0.088)
Trend	0.017** (0.006)	0.016* (0.006)	-0.002 (0.006)
Observations	1,553	1,553	1,553
R^2	0.509	0.491	0.434

Table 5. Robustness checks

This table presents the results of robustness checks of the hypothesis that returns play a risk-compensating role in the market for credit lines. The table shows only the estimated coefficients of the variable measuring risk and, in row (9), beta. The sample covers the period 2006:Q1–2012:Q2. The data were obtained from DealScan, Compustat, Capital IQ, Datastream, the CRSP, SEC 10-K and 10-Q filings, and credit contracts. The columns differ in the dependent variable used, that is, the coupon return, the AISD return, and the AISU return. Regarding the differences between robustness checks and the base model, in rows (1) to (3), risk is measured by the 12-month standard deviation of sample firms' daily stock returns, Altman's Z-score, and Ohlson's O-score, respectively. In row (4), instead of annualizing flow variables to calculate firm-specific controls, we use the quarterly values of accounting variables to compute controls and then average these from quarter t to $t-3$. Rows (5) and (6) use alternative methods to amortize upfront fees. In row (5), the amount amortized each quarter is equal to the upfront fee divided by the number of quarters between the quarter in which the contract (either the original contract or the amendment including the fee) is settled and the earliest quarter between the quarter corresponding to the maturity date of the contract and the quarter in which the loan path of the facility terminates. In row (6), upfront fees are amortized only while the credit contracts that include them are not amended or terminated. In row (7), we use 14 months as the maturity threshold that divides facilities into those that do not have to hold capital for the unused portion of the commitment and those that do. In row (8), no threshold is used to compute the returns. In row (9), the beta coefficient that relates corporate and market excess returns is included in the regression model. In rows (10) and (11), the sample is split between 2006:Q1–2009:Q2 and 2009:Q3–2012:Q2, respectively. The last two rows only take into account firms whose mean standard deviation of stock returns is above the median of all sample firms. These means and medians are calculated for the sample and the 2007 crisis periods in rows (12) and (13), respectively. The regressions include quarter, one-digit SIC industry, and firm credit rating indicator variables. Statistical significance at the 5% and 1% levels is denoted by * and **, respectively. All the regressions are conducted with standard errors robust to within-facility dependence and heteroscedasticity. The variables are defined in Appendix A.

	Return	AISD return	AISU return

12-month st. dev. stock return (1)	9.477** (2.821)	10.620** (2.946)	0.421 (1.309)
Z-Score (2)	-0.065** (0.022)	-0.055* (0.025)	-0.025** (0.009)
O-Score (3)	0.156** (0.028)	0.152** (0.028)	0.021 (0.014)
Averages firm-specific controls (4)	6.889** (1.961)	7.860** (1.967)	0.031 (0.825)
Upfront fee I (5)	6.986** (2.068)	7.821** (2.043)	0.447 (0.954)
Upfront fee II (6)	6.869** (1.928)	7.618** (1.883)	-0.160 (0.632)
Capital for unused portion I (7)	5.879* (2.290)	6.588** (2.247)	0.285 (0.875)
Capital for unused portion II (8)	5.932** (2.287)	6.646** (2.245)	0.339 (0.868)
Beta (9) — Risk	7.220** (2.095)	8.000** (2.101)	0.030 (0.908)
Beta (9) — Beta	-0.155 (0.246)	-0.132 (0.260)	0.123 (0.143)
2006:Q1–2009:Q2 (10)	5.284* (2.239)	5.916* (2.300)	0.422 (0.798)
2009:Q3–2012:Q2 (11)	8.012** (3.059)	9.132** (3.273)	0.339 (2.095)
Riskiest firms I (12)	6.007* (2.352)	6.786** (2.338)	-0.257 (1.169)
Riskiest firms II (13)	5.452* (2.476)	6.375* (2.473)	-0.628 (1.199)

Table 6. Renegotiation

This table presents the effect of renegotiation on the risk–return trade-off in the market for credit lines. To perform the analysis, some variables are added to the base model. The table shows only the estimated coefficients of risk and these variables. The sample covers the period 2006:Q1–2012:Q2. The data were obtained from DealScan, Compustat, Capital IQ, Datastream, the CRSP, SEC 10-K and 10-Q filings, and credit contracts. The columns differ in the characteristics of the empirical specification. Renegotiation intensity is measured by the average duration-to-maturity ratio of the loan path in all columns except (5), where it is measured as the ratio of the number of sample contracts in a loan path to the total duration of the loan path. The empirical specification in column (2) includes a (0, 1) indicator variable that is equal to one if the facility contract has a pricing grid. Column (3) also includes an interaction term between this variable and risk. The empirical specifications in columns (4) and (5) include two variables that control for the duration of the facilities and loan paths. The results in columns (6) and (7) are estimated, respectively, without facilities with a maturity at origination shorter than 12 months and without censored facilities. The regressions include quarter, one-digit SIC industry, and firm credit rating indicator variables. Statistical significance at the 5% and 1% levels is denoted by * and **, respectively. All the regressions are conducted with standard errors robust to within-facility dependence and heteroscedasticity. The variables are defined in Appendix A.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Risk	18.410** (3.662)	18.750** (3.732)	22.940** (4.714)	18.890** (4.353)	-2.198 (3.692)	16.260** (3.755)	19.000** (4.124)
Reneg. intensity	0.031 (0.248)	0.042 (0.247)	0.109 (0.245)	-0.027 (0.331)	-3.640 (2.322)	-0.074 (0.245)	0.075 (0.267)
Risk * Reneg. intensity	-21.670** (6.095)	-22.260** (6.153)	-24.640** (6.113)	-21.770** (6.798)	142.000** (54.680)	-16.930** (5.905)	-22.740** (6.568)
Pricing grid	-	-0.127 (0.155)	0.051 (0.210)	-	-	-	-
Risk * Pricing grid	-	-	-4.670 (3.430)	-	-	-	-
Facility duration	-	-	-	0.002 (0.004)	-0.005 (0.003)	-	-
Loan path duration	-	-	-	-0.001 (0.003)	-0.001 (0.003)	-	-
Observations	1,386	1,382	1,382	1,139	1,139	1,348	1,233

R^2	0.534	0.531	0.533	0.544	0.532	0.531	0.538