# Mind the Gap: The Difference between US and European Loan Rates

**Tobias Berg[†], Anthony Saunders[‡], Sascha Steffen[*], Daniel Streitz[**]**

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**Abstract**

Carey and Nini (2007) provide evidence that interest rate spreads on syndicated loans differed systematically between the European and the US market during the 1992 to 2002 period. Loan spreads in Europe are, on average, about 30 basis points smaller than in the US. We show that accounting for unused fees (AISU) fully explains the pricing puzzle for lines of credit. While European borrowers pay a significantly higher AISD, they also pay a significantly lower AISU. For term loans, we document a systematic selection effect: Firms with high borrowing costs in the market for lines of credit ─ as measured via the AISD and AISU ─ are more likely to also be active in the term loan market. This selection effect is significantly smaller in Europe and explains 50-90% of the pricing difference between US and European term loans. These results are consistent with contingent funding being exclusively provided by banks, while term funding is subject to a selection effect depending on the availability of outside options for borrowing via bond markets.

[†]University of Bonn, Email: tobias.berg@uni-bonn.de Tel: +49 228 73 6103.
[‡]Stern School of Business, New York University. Email: asaunder@stern.nyu.edu Tel: +1 212 998 0711.
[*]European School of Management and Technology (ESMT). Email: steffen@esmt.org Tel: +49 30 181 1544.
[**]Humboldt University Berlin, Email: daniel.streitz@wiwi.hu-berlin.de Tel: +49 30 2093 5624.

# I. Introduction

Carey and Nini (2007) show that prices for syndicated loans differ systematically between the European and the US market. They show that loan spreads in the corporate syndicated loan market are, on average, about 30 basis points (bps) smaller in Europe in the 1990 to 2002 period. This finding is puzzling as financial theory suggests that arbitrage opportunities will be competed away unless this is prevented by market frictions. The market for syndicated loans, however, is globally integrated with a large number of international players (borrowers, banks, and non-bank lenders). Therefore, it is not surprising that the existence of this puzzle has stirred a wide debate among academics. In this paper we revisit the pricing puzzle documented by Carey and Nini (2007), CN henceforth, and offer some potential explanations.

We start by reproducing the result from CN over the same sample period used in their paper (1992-2002) and the same measure for the cost of borrowing (All-In-Spread-Drawn (AISD)). We are able to replicate their result, with both a similar economic and statistical magnitude as reported by CN.

We then explicitly distinguish between term loans (approximately 30% of the Dealscan sample) and lines of credit (approximately 70% of the Dealscan sample). Thus, lines of credit comprise the majority of the sample. We document that the prizing puzzle is lower for lines of credit (13 bps lower AISD for European borrowers) than for term loans (41 bps lower AISD for European borrowers). Crucially, lines of credit and term loans differ significantly in their contractual design: While term loans are always fully drawn down at loan origination, lines of credit can either be drawn or left undrawn. Borrowers pay the All-In-Spread-Drawn (AISD) on the drawn amount while they pay the All-In-Spread-Undrawn (AISU) on the undrawn amount. We document that European borrowers pay a lower AISD compared to US borrowers (as shown by CN), however, they pay a significantly higher All-

In-Spread-Undrawn (AISU). We show that even under conservative assumptions for the loan take down rate, the actual costs of borrowing do not differ across both markets.[1] Additionally including other loan fees in the loan pricing measure, as suggested by Berg, Saunders, and Steffen (2013), henceforth BSS (2013), does not affect this result. If anything, additional loan fees further reduce the pricing difference between the US and the European market. Overall, our results suggest that the pricing *structure* of lines of credit differ fundamentally between European and the US syndicated loans. Taking into account these different loan pricing structures fully explains the pricing puzzle for lines of credit.

In a second step, we show that there is a selection effect for term loan borrowers. That is, (almost) all firms enter the market for credit lines to obtain liquidity insurance (Sufi (2009)). In contrast, firms that require direct liquidity can choose between issuing a corporate bond and obtaining a bank loan. We demonstrate that poor-creditworthy firms are much more likely to use term loans as their source of borrowed funds, and this effect is significantly stronger in the US than in Europe. We demonstrate this effect by using the market for credit lines to separate firms that have a high residual idiosyncratic risk after controlling for observable firm characteristics from firms that have a low residual risk after controlling for observable firm characteristics. A positive (negative) residual implies that the firm pays a larger (lower) spread on credit lines than predicted by the model, which includes the credit rating and other observable loan characteristics. The residual captures credit risk differences across firms that cannot be explained by observable characteristics. Consistent with a selection effect, we find that in the US market firms that have a high residual risk, according to our credit line pricing model, also rely on term loans. This effect is much less pronounced for the European market. Accounting for this selection effect provides additional shrinkage in the pricing difference for term loans between European and US borrowers.

[1] We do not find that the loan take down ratio itself differs fundamentally across markets.

Throughout our analysis, we use the same sample period and control variables as in CN. In a robustness section we demonstrate that our results are robust to i) extending the sample period to 2007, and ii) controlling for further firm characteristics. We further demonstrate that our results are also unaffected by controlling for firm volatility as suggested by Gaul and Uysal (2013).

Our paper relates to different strands of the literature: First, our paper emphasizes the importance of explicitly distinguishing between term loans and lines of credit when analyzing the pricing of syndicated loans. We contribute to the loan pricing literature by analyzing pricing *structures* in an international setting and by showing that pricing structure differences can explain the loan spread differences between US and European syndicated loans for credit lines. Second, we document that the structure of the US term loan market differs significantly from that of the European market. We thereby add to the growing literature on the international syndicated loan market structure (Esty and Megginson (2004), Giannetti and Laeven (2012), Giannetti and Yafeh (2012)).

The remainder of the paper proceeds as follows. Section II describes the sample selection process and provides descriptive statistics, Section III revisits the analysis by CN. Section IV analyzes differences in credit line pricing structure between the US and the European loan market. Section V analyzes the pricing puzzle for term loans. Section VI contains robustness tests and Section VII concludes.

## II. Data

We obtain our loan sample from the LPC's Dealscan database, which contains detailed information on corporate loan issues. We obtain all spreads and fees as well as other relevant information including maturity, loan size, facility type and purpose. All variables are

described in detail in Appendix A. We restrict our sample to loans issued by US and European borrowers between 1992 and 2002 to make our results comparable to CN. We extend the sample to 2007 in Section VI. Following CN, we also exclude all loans issued by borrowers without credit ratings and retain financials in the sample.[2] Agency credit ratings are obtained from Standard and Poor's, borrower characteristics from Compustat. Our final sample consists of 7,737 loan tranches issued by 1,659 distinct borrowers during the 1992 to 2002 period. Table I presents descriptive statistics for the final sample, segregated into loans issued by US borrowers and loans issued by European borrowers.

[Table I here]

Panel A of Table I shows loan characteristics. The AISD differs significantly between both markets, with the median spread being 50 bps lower for European loans. Strikingly and consistent with CN, European loans are much larger than US loans. The mean/median loan amount is 484/250 million USD for US loans and 801/473 million USD for European loans. Loans to European corporations have a longer maturity compared to loans to US corporations – 11% (26%) of US (European) loans have a maturity that exceeds 6 years. Panel B of Table I shows the borrower characteristics. Consistent with CN, we find that the fraction of borrowers that have an investment grade rating is larger in the European loan sample than in the US sample. 74% of the borrowers have an investment grade rating at the time of the loan issue in the European market compared to 58% in the US market.

## III. Base Specification

[2] Our results remain virtually unchanged if we exclude all borrowers with SIC code 6000-6999 from the sample.

We start by replicating the main results of CN and additionally distinguish between term loans and lines of credit. Table II provides the results of a multivariate regression of the AISD on a European-dummy and covariates associated with the riskiness of loans and borrowers.

[Table II here]

Consistent with CN, we find that syndicated loan spreads are significantly lower in Europe than in the US over the 1992 to 2002 period. The magnitude of the effect (-16 bps) is similar to the results reported by CN (-25 bps). The pricing puzzle exists both for investment grade borrowers (-18 bps, $p < 0.01$) as well as for non-investment grade borrowers (-31 bps, $p < 0.1$). Columns 4 and 5 show the results for the pricing puzzle by loan type. The pricing puzzle is much larger for term loans (-41 bps) than for lines of credit (-13 bps) over the period analyzed by CN, with the difference being significant at the 1 percent level. These results also hold when splitting the sample into investment grade and non-investment grade borrowers: For both segments, the pricing puzzle for lines of credit is smaller than the pricing puzzle for term loans over the 1992 to 2002 period.[3] We will analyze potential explanations for this finding in the following sections.

## IV. Pricing Puzzle for Lines of Credit

The results reported in Table II document that the magnitude of the pricing puzzle differs for term loans and lines of credit. We analyze the pricing of lines of credit in more detail in this section. Distinguishing between term loans and lines of credit is important, as term loans provide term funding to borrowers, while lines of credit provide contingent liquidity. Contingent liquidity means that borrowers do not necessarily immediately use the entire loan that is committed by the bank. However, most loan pricing studies implicitly make this

[3] Results are available from the authors upon request.

assumption by solely focusing on the All-In-Spread-Drawn[4] (AISD) as the main proxy for the price of a loan. We calculate the Usage-Weighted-Spread (USW) as more comprehensive measure of credit line pricing. The USW is a weighted average of the AISD, i.e. the spread paid by the borrower on used capital, and the All-In-Spread-Undrawn[5] (AISU), i.e. the spread paid by the borrower on committed but not yet used capital.

$$USW(PDD) = PDD*AISD+(1-PDD)*AISU \quad (1)$$

PDD is the probability that one $ of a committed loan is actually drawn down. A PDD of one implies that the borrower borrows the entire commitment under the loan agreement; a PDD of zero implies that the borrower never actually takes down the loan commitment at all. Ideally, one should use a firm/loan specific PDD, however, this information is not readily available. Capital IQ provides data on credit line usage on the firm level, however, only from 2002 onwards. Figure 1 shows the average draw down ratio for the US and the European market for the 2002 to 2010 period. The figure suggests that the average draw down rate is about 30-35% and that there are no fundamental differences across both markets.

[Figure 1 here]

Mian and Santos (2012) show that, on average, 55% of a revolving facility is actually drawn down in their sample.[6] Jiménez, Lopez, and Saurina (2009) use a sample of loans to Spanish firms during the 1984 to 2005 period. Their findings suggest that the PDD is about 47% for non defaulting firms. We report results assuming a PDD between 35% and 55%. This assumption is conservative as all of our companies are rated and a majority have an investment grade rating.

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4 The AISD contains the spread and the facility fee. Facility fees are fees paid on the entire committed amount, regardless of usage.

5 The AISU contains the commitment fee and the facility fee. Commitment fees are fees paid on the unused amount of loan commitments. Facility fees are fees paid on the entire committed amount, regardless of usage. Commitment fees and facility fees are usually mutually exclusive.

6 See also Jacobs (2008), who reports an average loan take down rate of 56%.

Figure 2 highlights this difference in the pricing structure. For investment grade borrowers in Europe, the AISD for credit lines is on average 50 bps – which is approximately 13 bps lower than in the US (63 bps). For the AISU, however, we observe the opposite result: The AISU in the European market is approximately *larger* than the AISU in the US market (19 bps versus 14 bps). For borrowers with a below investment grade rating, the AISD (AISU) for the average European borrower is 205 bps (57 bps), the AISD (AISU) for the average US borrower is 192 bps (40 bps).

[Figure 2 here]

Table III presents descriptive statistics for the AISD, AISU, and UWS for the US and the European market. We find – consistent with the results reported in Table II column 5, that the AISD is lower in the European market, however, only for investment grade borrowers. The AISU, in contrast, is significantly higher in the European market relative to the US market. This implies that, depending on the take-down rate, the overall or actual cost of borrowing may not be different for US borrowers relative to European borrowers. Assuming a draw down rate of 45%, we find no significant pricing differences between both markets. The USW(45%) is 37 bps for investment grade US borrowers and 33 bps for investment grade European borrowers with the difference being statistically insignificant. For non investment grade borrower the USW (45%) is, if anything, higher in the European market compared to the US.

[Table III here]

BSS (2013) show that fees are an integral part of loan pricing. More than 80% of syndicated loan contracts contain fees and accounting for fees leads to significantly higher costs of corporate borrowing. We follow BSS (2013) and calculate a measure for the total cost

of borrowing (TCB). This proxy is conceptually similar to the USW but additionally comprises other fees, like upfront, cancellation, and utilization fees, available in the Dealscan database. We refer to BSS (2013) and Appendix B in this paper for a detailed description of the TCB measure.[7] As shown in Table III the results for the TCB measure do not differ fundamentally from the results for the USW measure, that is, we do not find a significant difference in the pricing of lines of credit between the US and the European loan markets.

Table IV provides the results of a multivariate regression of the different loan price terms on a European-dummy and covariates associated with the riskiness of loans and borrowers.

[Table IV here]

Column 4 shows that the pricing puzzle disappears in the sample of credit lines using reasonable assumptions for the range of takedowns (PDD). The coefficient for the European market dummy is -2 bps and insignificant assuming a PDD of 45%. Additionally accounting for other loan fees further reduces any pricing differences between the US and the European markets. The coefficient on the European market dummy is +5 bps and statistically insignificant in the TCB regression.[8] The sensitivity analyses (columns 3 and 5) show that the pricing puzzle is increasing in the PDD. Overall, we provide evidence that the pricing *structure* differs between the US and the European credit line market but not the actual loan pricing or costs.

## V. Pricing Puzzle for Term Loans

[7] Appendix B further provides descriptive statistics for the different fee types in the US and the European syndicated loan markets.

[8] See Appendix B, Table B.III for a detailed decomposition of the AISD versus the TCB results. The results again confirm that the main difference between the US and the European markets is that the AISU is significantly higher in the European market compared to the US market. Further, European companies pay a higher upfront fee when compared to US companies.

We have established so far, that there is no pricing puzzle for lines of credit after accounting for unused commitment fees (AISU). In this section, we analyze the pricing difference between European and US borrowers in the term loan market. The market for term loans differs from the market for credit lines in several ways. Most importantly, while term loans provide relatively long-term funding to borrowers, lines of credit provide often short-term sources of contingent liquidity. While term funding is also available in the bond market, contingent liquidity is almost exclusively provided by banks (see Gatev and Strahan (2009) and Kashyap, Rajan, and Stein (2002)). This implies that firms seeking contingent liquidity have to enter the market for credit lines. In contrast, firms that require term funding have the option to either issue a bond or obtain a term loan. Bond issues are especially attractive for large rated companies with low credit risk that do not require close monitoring by a bank.

Several studies show that European countries have bank-based markets – corporations obtain most of their debt financing from banks (De Fiore and Uhlig (2011); Gorton and Schmid (2000)). It is therefore likely that large European companies are more likely to borrow term loans, while large US companies satisfy their funding needs via bond issues. This can potentially explain why the pricing puzzle is especially prevalent in the term loan market, i.e. it should be more likely to observe larger low risk European companies issuing term loans but not large low risk US companies (who issue bonds instead). Figure 3 highlights differences in the debt structures of European and US companies that are consistent with this conjecture.[9] While rated European firms obtain about 45% of their debt financing via bond issues, the ratio of bond debt to other debt is over 75% for rated US companies.

[Figure 3 here]

One possible way to alleviate a potential selection bias is to (propensity score) match each European firm to a similar US firm. The main drawback of this approach, however, is

[9] Again, data is obtained from Capital IQ and only available from 2002 onwards.

that PSM is only possible based on *observable* firm characteristics. If differences in credit risk between European and US companies are *unobservable*, i.e. not fully captured by the credit rating and other firm characteristics, then PSM yields biased results. We propose a different methodology to assess whether the pricing differences between term loans to US firms and term loans to European firms are driven by unobservable differences in borrower risk: We use the market for credit lines to separate firms that have a large residual risk after controlling for observable firm characteristics from firms that have a low residual risk after controlling for observable firm characteristics. I.e., we predict the residual using the credit line market regression reported in Table IV column 4 (USW(45%)) or column 6 (TCB(45%)). A positive (negative) residual implies that the firm pays a larger (lower) spread than predicted by the model, which includes the credit rating and other observable loan characteristics.

This approach relies on the assumption that there is no structural difference between firms that are active the US market for lines of credit and firms that are active in the European market for lines of credit. There is reason to belief that this assumption holds. First, almost all firms have a line of credit, even firms that are fully equity financed (Sufi (2009)). Thus, the selection effect in the market for lines of credit is likely to be small. Second, contingent liquidity is almost exclusively provided by banks (see Gatev and Strahan (2009) and Kashyap, Rajan, and Stein (2002)), hence all firms have to rely on credit lines provided by banks to obtain liquidity insurance. Third, the European market dummy is insignificant and close to zero in the credit line sample after fully accounting for credit lines usage and loan fees (see Table IV columns 3 to 6).

We expect that firms that have a high residual in the credit line market regression are the firms that are also active in the market for term loans: only high-risk companies also issue term loans, while low-risk companies rely on bond financing. We further expect this pattern to be especially pronounced in the US market: the US market is more capital market oriented

than the bank-based European market (De Fiore and Uhlig (2011); Gorton and Schmid (2000)).

Figure 4 plots the fraction of credit line tranches that are jointly (within one month) issued with term loan tranches for quartiles of TCB(45%) as well as for quartiles of the residual obtained from regressing TCB(45%) on covariates associated with borrower risk and other control variables (see Table IV column 6).[10]

[Figure 4 here]

Figure 4.1 shows that the fraction of firms that issue term loans is increasing in the spread that these firms pay in the market for credit lines. Firms in the highest quartile by revolver spread have concurrent term loan borrowings in 45% of the cases in the US (40% in Europe) while firms in the lowest quartile by revolver spread have concurrent borrowings in only 1% of all cases (7% in Europe). These results also hold after controlling for observable loan and borrower characteristics. We orthogonalize the spread with observable borrower and loan characteristics (see Table IV column 6) and plot the fraction of credit line tranches that are jointly (within 1 month) issued with term loan tranches for quartiles of credit line spread residual. Figure 4.2 shows that the fraction of firms that issue term loans is still – after controlling for observable borrower characteristics such as the issuer credit rating – especially high if the residual from the credit line pricing regression is large, i.e. if the firm is riskier than predicted by the model. Again, the term loan market participation is lower for US firms except for the high-risk quartile. This shows that one cannot account for the selection effect by simply controlling for observable firm and loan characteristics.

[10] We screen for term loans that are issued by the borrower +/– 15 days around the respective revolver issue. Our results are not sensitive to the choice of the window, i.e. we obtain similar results if we use +/– 90 days, or limit our sample to credit lines that are jointly issued with a term loan tranche on the exact same day.

We use the residual from the credit line pricing regression as a proxy for unobservable differences between US and European firms. Table V presents term loan market pricing regressions that include the residual from the credit line market regression. For each term loan tranche we use the pricing regression residual of the credit line tranche that is included in the same package. Note that this effectively limits the sample to term loan tranches that are jointly (within one month) issued with (at least) one credit line tranche.

[Table V here]

Columns 1 and 3 show that the pricing differences between US borrowers and European borrowers continue to exist after excluding term loan tranches that are not jointly (within one month) issued with a credit line tranche, regardless of whether AISD or TCB is used to measure the cost of borrowing. The effect is similar in magnitude compared to the full sample results reported in Table II column 4. Table V column 2 includes the residual from the credit line market regression as reported in Table IV column 4, i.e. using the USW(45%) as a proxy for the pricing of credit lines. The economic magnitude of the European market dummy is reduced by about 50% (however, still statistically significant). Table V column 4 includes the residual from the credit line market regression as reported in Table IV column 6, i.e. using the TCB(45%) as a proxy for the pricing of credit lines. In this specification, the European market dummy is no longer significant and the economic magnitude of the European market dummy is reduced by about 90%.

Overall, our results are consistent with a structural difference between the US and the European term loan market. The European market is bank-based and large low risk European companies issue term loans, while large low risk US companies prefer bond issues. Hence, European and US term loan issuers are not directly comparable and that this structural difference can explain the observed spread differences.

## VI. Robustness

### *A. Borrower Characteristics*

We have so far not controlled for any borrower characteristics apart from the credit rating to directly compare our findings to CN. As noted by CN, accounting ratios may not be directly comparable across countries because they are subject to different accounting standards. For robustness, we replicate our main results controlling for the key accounting ratios that also used in the robustness section of CN (firm size, leverage, profitability, and market-to-book). The results are reported in Table VI and Table VII.

[Table VI and Table VII here]

Table VI column 6 shows that fees continue to fully explain any pricing differences between the US and the European markets after controlling for other borrower characteristics. Also the results for the term loan market remain virtually unaffected. Table VII columns 2 and 4 show that the European market dummy is statistically insignificant and economically small after controlling for the residual from the credit line market regression.

### *B. Extending the Sample to 2007*

We have so far restricted our sample to 1992 to 2002 to directly compare our findings to CN. We now extend the sample to 2007 to ensure that our results are not specific to the 1992 to 2002 period.[11] The results are reported in Table VIII and Table IX.

[Table VIII and Table IX here]

[11] We exclude the 2008 to 2010 period to avoid any contaminating effect of the subprime crisis. However, our results remain qualitatively unchanged if we analyze the 1992 to 2010 period. These results are available from the authors upon request.

We find that fees reduce the spread difference between the US market and the European market by approximately 75% for lines of credit in the 1992 to 2007 period, depending on the assumption about the drawdown rate. However, the European market dummy remains significant (though economically small). However, as noted before, the majority of European companies in our sample have an investment grade rating (above 70% of the sample), so their credit line takedown rate is likely well below 20% (see Asarnow and Marker (1995)). This implies that even the 7 bps pricing difference between the US and the European markets that remains assuming a 35% credit line takedown rate is an overstatement of the true effect.

Table IX shows the results for the term loan sample. The results reported in column 2 and column 4 show that the residual from the credit line market regression continues to explain the pricing puzzle also over the 1992 to 2007 period.

## *C. Instrumented Equity Volatility*

Gaul and Uysal (2013) provide evidence that differences in firm volatility can explain the pricing difference between the European and the US syndicated loan market. The authors argue that firm volatility, i.e., asset return volatility, is a primary determinant of the cost of debt financing. Empirical studies commonly use equity volatility as a proxy for asset volatility, as asset volatility cannot readily be observed. However, Gaul and Uysal (2013) argue that equity volatility is at best a noisy proxy for asset volatility and suggest using an instrumental variable approach to deal with the measurement problem. In particular, the authors use the standard deviation of the ratio of total equity to total assets, *Book Equity Volatility*, and the standard deviation of cash and short term investments to assets, *Cash & STI Volatility*, as instruments for firm volatility.

We replicate the IV approach suggested by Gaul and Uysal (2013) for robustness. The results reported in Appendix C indicate that the IV approach has a large explanatory power for term loans issued by non-rated companies, but not in the sample of rated companies that we analyze. This is consistent with a large part of the cross-sectional differences in firm volatility being captured by the credit rating.

We now explicitly incorporate the IV approach in our main specifications. Table X presents the results for the credit line sample.

[Table X here]

Column 1 shows the baseline effect for comparison. Table X column 2 additionally includes the equity volatility as a control variable. Comparable to Gaul and Uysal (2013) the equity volatility is significantly positively related to the loan spread, however, the coefficient of the European market dummy remains virtually unchanged. Column 3 shows the second stage of an IV regression in which the standard deviation of the ratio of total equity to total assets and the standard deviation of cash and short term investments to assets are used as instruments for the equity volatility.[12] Again, we find a similar spread difference between the US and the European market. Column 4 uses UWS instead of AISD to proxy for the loan price. The spread difference between the US and the European market is reduced by about 15 bps after controlling for unused fees. The effect is further reduced when additional fees are considered (column 5).

Table XI presents the results using the IV approach suggested by Gaul and Uysal (2013) for the term loan sample.

[Table XI here]

[12] Both instruments are positively correlated with equity volatility but statistically insignificant in the first stage.

Similar to the credit line sample the average spread difference between loans to European borrowers and loan to US borrowers remain economically meaningful after instrumenting the equity volatility. However, compared to the results reported in Table XI column 1 the coefficient of the European market dummy is about 10 bps lower and no longer significant in the IV specification. I.e., the IV specification has a larger explanatory power in the term loan sample than in the credit line sample. This is consistent with unobservable differences between US and European borrowers being larger in the market for term loans compared to the market for credit lines (see our discussion in Section V).[13] Columns 4 and 5 show that the residual from the credit line market regression nevertheless still has explanatory power in the model and further reduces the coefficient of the European market dummy by 10 to 21 bps.

Overall, our results suggest that not instrumented equity volatility but fees and a selection effect in the term loan market can explain the spread differences between loans to rated US and European borrowers.

## VI. Conclusion

Carey and Nini (2007) document that interest rate spreads on syndicated loans differ systematically between the European and the US market during the 1992 to 2002 period. Loan spreads in Europe are, on average, about 30 basis points smaller than in the US. This finding is puzzling as financial theory suggests that arbitrage opportunities will be competed away unless this is prevented by market frictions. This paper revisits the pricing puzzle and offers potential explanations.

[13] Both instruments are positively correlated with equity volatility but only the standard deviation of cash and short term investments to assets is statistically significant in the first stage.

We split the sample in revolvers (~70% of the sample) and term loans (~30% of the sample) and analyze the pricing puzzle separately for each loan type. We show that, when looking at the All-In-Spread-Drawn (AISD), the pricing puzzle is significantly smaller for revolvers (13 basis points) than for term loans (41 basis points). For lines of credit, we show that the pricing puzzle fully disappears once unused fees (AISU) are taken into account: While European borrowers pay a higher AISD, they also pay a lower AISU. For term loans, we show that a significant amount of the prizing puzzle (50-90% depending on the specification) can be explained by a selection effect. US companies that fall in the highest spread quartile in the market for credit lines are more likely to issue term loans. This effect holds after controlling for observable borrower and loan characteristics, and it is significantly larger in the US than in Europe.

Taking together, we demonstrate that after taking into account for unused fees (lines of credit) and for a selection effect (term loans), pricing differences between the US and the European markets are small to non-existent. More generally, our results show the importance of including fees in the analysis of syndicated loans and to control for selection effects that seem to be prevalent on the term loan market.

## References


Asarnow, E. and J. Marker (1995). Historical Performance of the US Corporate Loan Market: 1988-1993, *Journal of Commercial Lending*, 10(2), 13-32.

Berg, T., T. Saunders, and S. Steffen (2013). The Total Costs of Corporate Borrowing in the Loan Market: Don't Ignore the Fees, Working Paper.

Bharath, S. T., S. Dahiya, A. Saunders, and A. Srinivasan (2011). Lending relationships and loan contract terms, *The Review of Financial Studies*, 24(4), 1142-1203.

Carey, M., and G. Nini (2007). Is the corporate loan market globally integrated? A pricing puzzle, *The Journal of Finance*, 62(6), 2969-3007.

Diamond, D (1983). Financial Intermediation and Delegated Monitoring, *Review of Economic Studies*, 51(3), 393-414.

De Fiore, F., and H. Uhlig (2011). Bank Finance versus Bond Finance, *Journal of Money, Credit and Banking*, 43(7), 1399-1421.

Esty, B. C., and W. L. Megginson (2003). Creditor rights, enforcement, and debt ownership structure: Evidence from the global syndicated loan market, *Journal of Financial and Quantitative Analysis*, 38(1), 37-60

Gatev, E. and P. E. Strahan (2009). Liquidity risk and syndicate structure, *Journal of Financial Economics*, 93(3), 490–504.

Gaul, L. and P. Uysal (2013). Can equity volatility explain the global loan pricing puzzle? *Review of Financial Studies*, 26 (12), 3225-3265.

Giannetti, M., and L. Laeven (2012). The flight home effect: Evidence from the syndicated loan market during financial crises, *Journal of Financial Economics*, 104(1), 23-43.

Giannetti, M., and Y. Yafeh (2012). Do cultural differences between contracting parties matter? Evidence from syndicated bank loans, *Management Science*, 58(2), 365-383.

Gorton, G and F. A. Schmid (2000). Universal banking and the performance of German firms, *Journal of Financial Economics*, 58(1-2), 29-80.

Ivashina, V., and Z. Sun (2011). Institutional demand pressure and the cost of corporate loans, *Journal of Financial Economics*, 99(3), 500-522.

Jacobs, Michael Jr. (2008). An Empirical Analysis of Exposure at Default, Working Paper, Office of the Comptroller of the Currency.

Jiminez, G., J. A. Lopez, and J. Saurina (2009). Empirical Analysis of Corporate Credit Lines, *Review of Financial Studies*, 22(12), 5069-5098.

Kashyap, A. K., R. Rajan, and J. C. Stein (2002). Banks as liquidity providers: An explanation for the coexistence of lending and deposit-taking, *The Journal of Finance*, 57(1), 33-73.

Mian, A. and J. Santos (2012). Liquidity Risk, Maturity Management and the Business Cycle, Working Paper.

Nandy, D. and P. Shao (2010). Institutional Investment in Syndicated Loans, Working Paper.

**Figure 1**
**Credit Line Draw-Down Ratios over Time – US vs. Europe**

This figure shows the average credit line usage by country over time. Credit line usage is defined as *Drawn Revolving Credit/(Undrawn Revolving Credit + Drawn Revolving Credit)*. The sample comprises all public US and European firms contained in the Capital IQ database with non-missing *Undrawn Revolving Credit* and *Drawn Revolving Credit*.

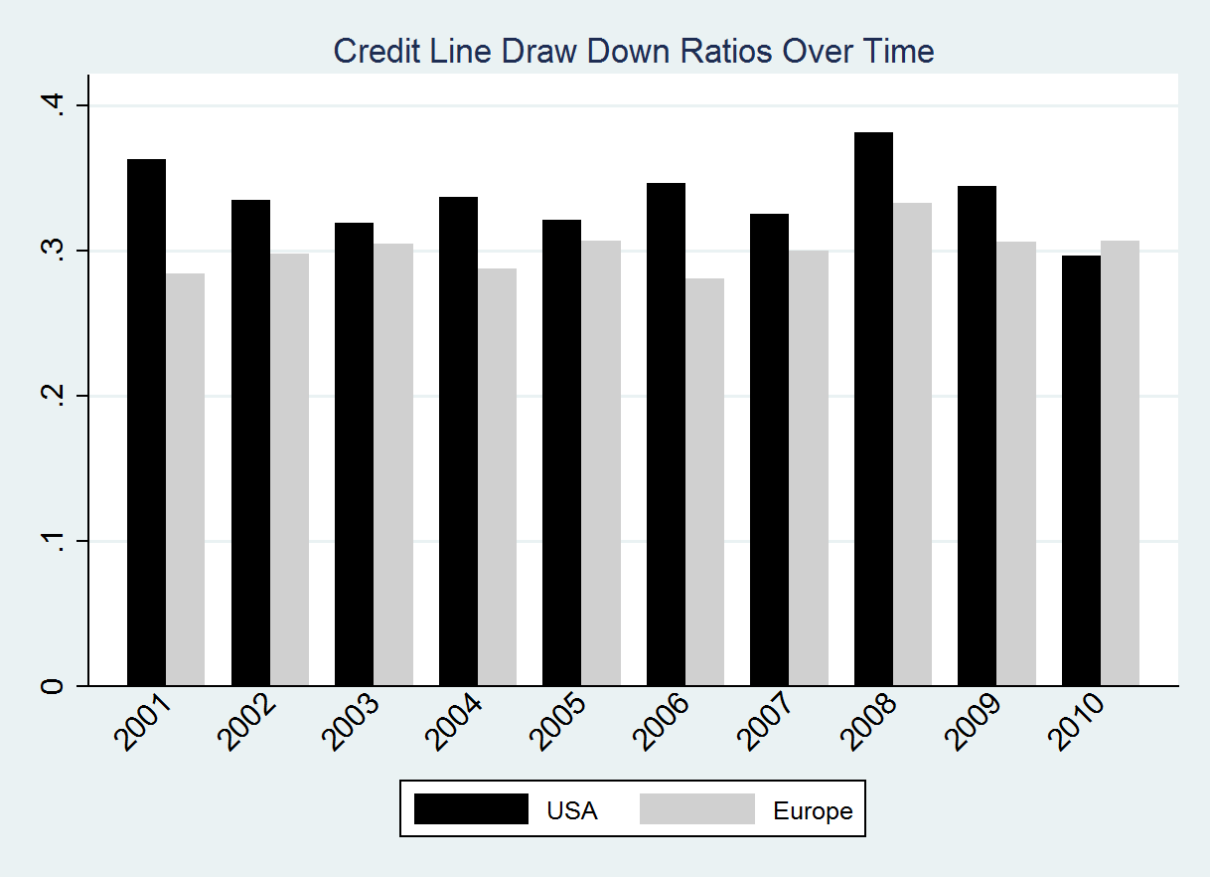


**Figure 2**
**Pricing Structure in the US and the European Loan Market: AISD versus AISU**

This figure shows the mean AISD and the mean AISU for lines of credit issued by European and US firms, distinguishing between firms that have an investment grade rating and firms that have a junk rating at the time of the loan origination.

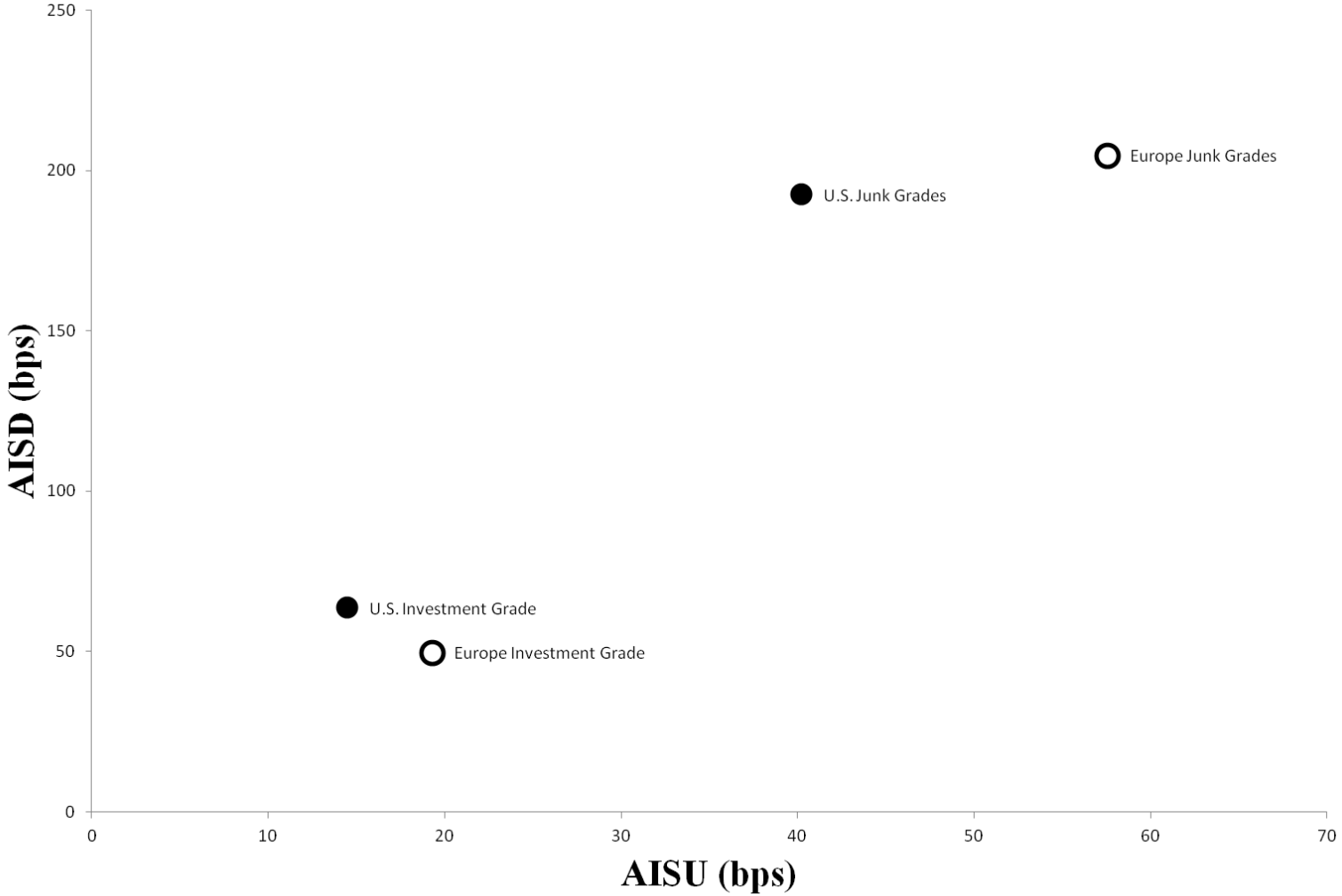
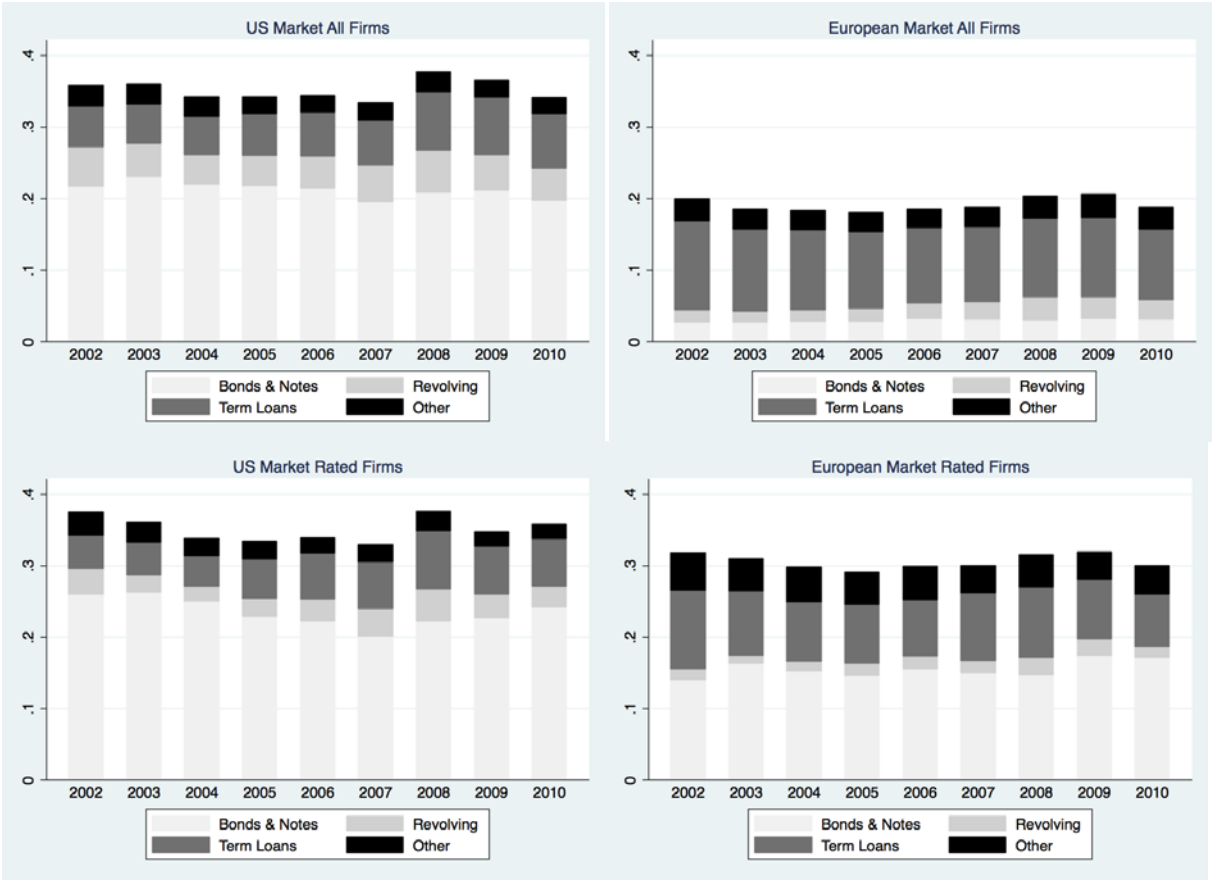


**Figure 3**
**Debt Structure – US versus European Firms**

This figure shows the time series of average firm-level debt structures for public US and European firms. All debt items are depicted as a fraction of total assets.



## Figure 4
## Term Loan Market Participation by Revolver Spread and Pricing Regression Residual

This figure shows the fraction of credit line tranches that are jointly (+/– 30 days) issued with (at least) one term loan tranche. The sample is split by quartiles of credit line TCB in Figure 3.1. The sample is split by quartiles of the residual from a credit line market pricing regression using TCB as the dependent variable (see Table V column 4) in Figure 3.2. A positive (negative) residual implies that the firm pays a larger (lower) spread than predicted by the model, which includes the credit rating and other observable firm and loan characteristics.

**Figure 4.1 – Term Loan Market Participation by Revolver Spread**

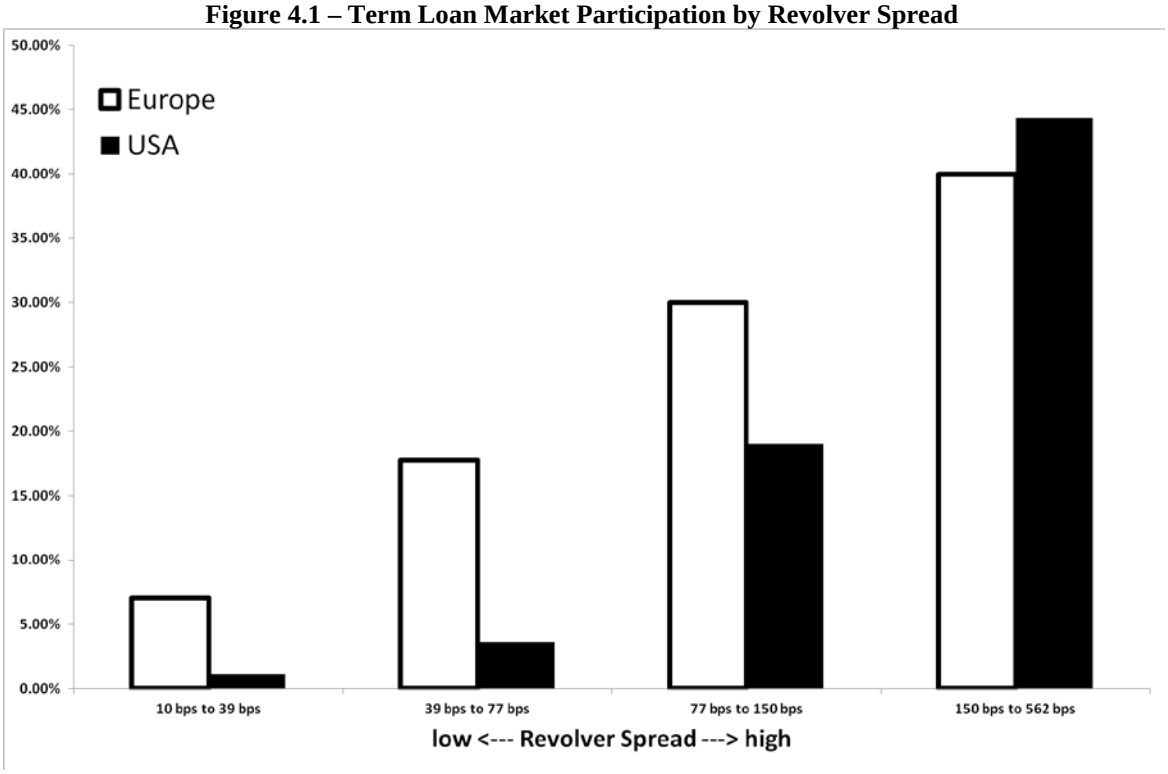
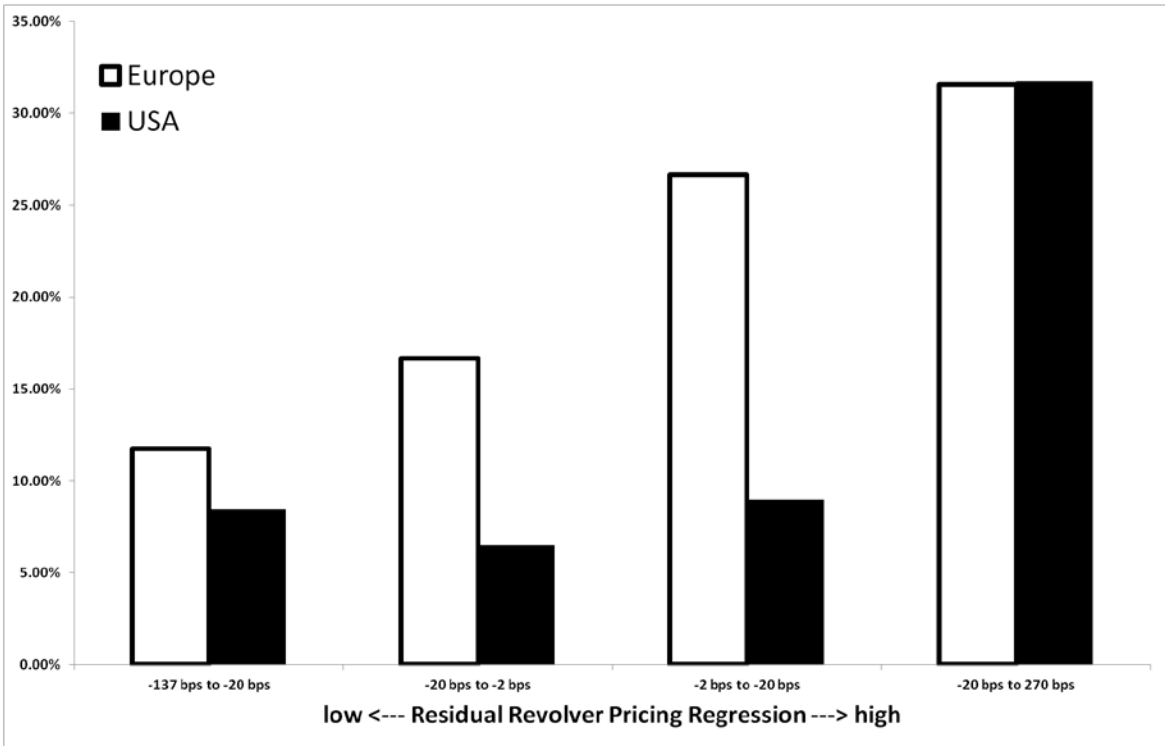



**Figure 4.2 – Term Loan Market Participation by Pricing Regression Residual**



## Table I
## Descriptive Statistics

This table provides summary statistics for loan and borrower characteristics for a sample of loans issued between 1992 and 2002. Panel A reports loan characteristics, Panel B reports borrower characteristics. For variable definitions see Appendix A.

| | US Market | | | | European Market | | | |
|---|---|---|---|---|---|---|---|---|
| Variable | **Observations** | **Mean** | **Median** | **Std** | **Observations** | **Mean** | **Median** | **Std** |
| **Panel A: Loan Characteristics** | | | | | | | | |
| AISD | 7,294 | 136.87 | 100.00 | 116.74 | 443 | 103.32 | 50.00 | 112.80 |
| Facility Amount (million USD) | 7,294 | 484.46 | 250.00 | 667.55 | 443 | 801.41 | 472.80 | 941.68 |
| Maturity 1-3yr (0/1) | 7,294 | 0.36 | 0.00 | 0.48 | 443 | 0.28 | 0.00 | 0.45 |
| Maturity 3-6yr (0/1) | 7,294 | 0.48 | 0.00 | 0.49 | 443 | 0.42 | 0.00 | 0.49 |
| Maturity >6yr (0/1) | 7,294 | 0.11 | 0.00 | 0.31 | 443 | 0.26 | 0.00 | 0.44 |
| Purpose: Takeover (0/1) | 7,294 | 0.14 | 0.00 | 0.34 | 443 | 0.13 | 0.00 | 0.34 |
| Purpose: Ship, Plane, or SPV Finance (0/1) | 7,294 | 0.00 | 0.00 | 0.00 | 443 | 0.00 | 0.00 | 0.00 |
| Purpose: Project Finance (0/1) | 7,294 | 0.00 | 0.00 | 0.07 | 443 | 0.02 | 0.00 | 0.16 |
| Purpose: CP Backup (0/1) | 7,294 | 0.19 | 0.00 | 0.39 | 443 | 0.05 | 0.00 | 0.23 |
| Secured (0/1) | 7,294 | 0.34 | 0.00 | 0.47 | 443 | 0.14 | 0.00 | 0.35 |
| **Panel B: Borrower Characteristics** | | | | | | | | |
| Rating: AAA (0/1) | 7,294 | 0.01 | 0.00 | 0.10 | 443 | 0.04 | 0.00 | 0.20 |
| Rating: AA (0/1) | 7,294 | 0.05 | 0.00 | 0.22 | 443 | 0.17 | 0.00 | 0.38 |
| Rating: A (0/1) | 7,294 | 0.23 | 0.00 | 0.42 | 443 | 0.30 | 0.00 | 0.45 |
| Rating: BBB (0/1) | 7,294 | 0.29 | 0.00 | 0.45 | 443 | 0.23 | 0.00 | 0.42 |
| Rating: BB (0/1) | 7,294 | 0.21 | 0.00 | 0.41 | 443 | 0.10 | 0.00 | 0.31 |
| Rating: B (0/1) | 7,294 | 0.15 | 0.00 | 0.36 | 443 | 0.05 | 0.00 | 0.23 |

## Table II
## Base Factor Model Specification

This table provides results of a linear regression of AISD on European market dummies and control variables. For variable definitions see Appendix A. Fixed effects for year, two-digit SIC code, and borrower credit rating are not shown. We report t-values based on standard errors clustered at the borrowing firm in parentheses. ***, **, * denote significance at the 1, 5 and 10 % level, respectively.

| | **All Types All Grades** | **All Types Inv. Grade** | **All Types Junk Grades** | **Term Loans All Grades** | **Revolver All Grades** |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| Variable | AISD | AISD | AISD | AISD | AISD |
| **Europe (1992-2002) (0/1)** | -16.04*** | -18.47*** | -30.75** | -40.89*** | -13.12*** |
| | (-2.82) | (-3.68) | (-2.24) | (-3.69) | (-2.70) |
| **ln(Facility Amount)** | -10.22*** | -6.47*** | -12.91*** | -12.11*** | -9.37*** |
| | (-8.20) | (-4.86) | (-5.67) | (-4.22) | (-8.98) |
| **Maturity 1-3yr (0/1)** | 32.65*** | 18.34*** | 47.28*** | 48.63*** | 3.76 |
| | (4.38) | (2.72) | (2.59) | (2.92) | (0.83) |
| **Maturity 3-6yr (0/1)** | -3.81 | -4.30 | 3.09 | 7.61 | -28.65*** |
| | (-0.47) | (-0.51) | (0.17) | (0.49) | (-4.49) |
| **Maturity >6yr (0/1)** | 5.26 | 23.90** | 5.17 | 12.69 | -13.78* |
| | (0.56) | (2.11) | (0.26) | (0.78) | (-1.83) |
| **Secured (0/1)** | 57.78*** | 74.23*** | 39.52*** | 46.42*** | 63.90*** |
| | (15.30) | (12.57) | (8.89) | (7.08) | (17.06) |
| Time FE | Yes | Yes | Yes | Yes | Yes |
| Industry FE | Yes | Yes | Yes | Yes | Yes |
| Credit Rating FE | Yes | Yes | Yes | Yes | Yes |
| Loan Purpose FE | Yes | Yes | Yes | Yes | Yes |
| Loan Type FE | Yes | Yes | Yes | Yes | Yes |
| Observations | 7,737 | 4,663 | 2,819 | 1,656 | 5,741 |
| Adjusted $R^2$ | 0.68 | 0.59 | 0.52 | 0.52 | 0.69 |

## Table III
## Credit Lines: AISD vs. AISU – Univariate Results

This table provides summary statistics for credit line price terms separately for the US and the European market. Panel A reports statistics for borrowers that have an investment grade rating at the time of the loan issue. Panel B reports statistics for borrowers that have a junk rating at the time of the loan issue. For variable definitions see Appendix A. ***, **, * denote significance at the 1, 5 and 10 % level, respectively.

| | US Market | | European Market | | |
|---|---|---|---|---|---|
| Variable | **Mean** | **Obs.** | **Mean** | **Obs.** | **Diff** |
| **Panel A: Investment Grade** | | | | | |
| AISD | 63.51 | 3,733 | 49.70 | 228 | 13.81*** |
| AISU | 14.47 | 3,733 | 19.26 | 228 | -4.79*** |
| Usage Weighted Spread (45%) | 36.54 | 3,733 | 32.96 | 228 | 3.57 |
| TCB (45%) | 51.33 | 3,733 | 54.08 | 228 | -2.74 |
| **Panel B: Junk Grades** | | | | | |
| AISD | 192.51 | 1,750 | 204.66 | 30 | -12.15 |
| AISU | 40.19 | 1,750 | 57.55 | 30 | -17.35*** |
| Usage Weighted Spread (45%) | 108.73 | 1,750 | 123.75 | 30 | -15.01 |
| TCB (45%) | 127.89 | 1,750 | 152.74 | 30 | -24.84* |

## Table IV
## Credit Lines: AISD vs. AISU – Multivariate Results

This table provides results of a linear regression of loan price terms on European market dummies and control variables. For variable definitions see Appendix A. Fixed effects for year, two-digit SIC code, and borrower credit rating as well as other loan characteristics are included but not shown. We report t-values based on standard errors clustered at the borrowing firm in parentheses. ***, **, * denote significance at the 1, 5 and 10 % level, respectively.

| **Sample** | **Revolver** | **Revolver** | **Revolver** | **Revolver** | **Revolver** | **Revolver** |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Variable | AISD | AISU | UWS(35%) | UWS(45%) | UWS(55%) | TCB(45%) |
| **Europe (1992-2002) (0/1)** | -13.12*** | 5.87*** | -0.78 | -2.68 | -4.58 | 5.30 |
| | (-2.70) | (4.36) | (-0.32) | (-0.97) | (-1.46) | (1.41) |
| Loan Characteristics | Yes | Yes | Yes | Yes | Yes | Yes |
| Time FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Credit Rating FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Loan Purpose FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 5,741 | 5,741 | 5,741 | 5,741 | 5,741 | 5,741 |
| Adjusted $R^2$ | 0.69 | 0.65 | 0.70 | 0.70 | 0.70 | 0.71 |

## Table V
## Term Loans: Controlling for the Residual from the Revolver Market Regression

This table provides results of a linear regression of AISD or TCB on European market dummies and control variables. For variable definitions see Appendix A. Fixed effects for year, two-digit SIC code, and borrower credit rating as well as other loan characteristics are included but not shown. We report t-values based on standard errors clustered at the borrowing firm in parentheses. ***, **, * denote significance at the 1, 5 and 10 % level, respectively.

| **Sample** | **Term Loans** | **Term Loans** | **Term Loans** | **Term Loans** |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Variable | AISD | AISD | TCB(45%) | TCB(45%) |
| **Europe (1992-2002) (0/1)** | -47.69*** | -22.25** | -44.41** | -3.44 |
| | (-2.60) | (-2.58) | (-2.22) | (-0.31) |
| **Revolver Residual** | | 1.71*** | | 1.50*** |
| | | (23.63) | | (23.46) |
| Loan Characteristics | Yes | Yes | Yes | Yes |
| Time FE | Yes | Yes | Yes | Yes |
| Industry FE | Yes | Yes | Yes | Yes |
| Credit Rating FE | Yes | Yes | Yes | Yes |
| Loan Purpose FE | Yes | Yes | Yes | Yes |
| Observations | 1,126 | 1,126 | 1,126 | 1,126 |
| Adjusted $R^2$ | 0.50 | 0.81 | 0.49 | 0.79 |

## Table VI
## Credit Lines – Controlling for Borrower Characteristics

This table provides results of a linear regression of loan price terms on European market dummies and control variables. For variable definitions see Appendix A. Fixed effects for year, two-digit SIC code, and borrower credit rating as well as other loan characteristics are included but not shown. We report t-values based on standard errors clustered at the borrowing firm in parentheses. ***, **, * denote significance at the 1, 5 and 10 % level, respectively.

| **Sample** | **Revolver** | **Revolver** | **Revolver** | **Revolver** | **Revolver** | **Revolver** |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Variable | AISD | AISU | UWS(35%) | UWS(45%) | UWS(55%) | TCB(45%) |
| **Europe (1992-2002) (0/1)** | -21.39*** | 4.79*** | -4.37 | -6.99** | -9.61*** | 1.17 |
| | (-3.71) | (3.24) | (-1.56) | (-2.16) | (-2.61) | (0.27) |
| **ln(Total Assets)** | 5.14*** | 1.11*** | 2.52*** | 2.92*** | 3.33*** | 3.67*** |
| | (3.68) | (3.68) | (3.83) | (3.80) | (3.77) | (4.33) |
| **Market-to-Book** | -8.60*** | -1.03*** | -3.68*** | -4.44*** | -5.20*** | -4.06*** |
| | (-6.60) | (-3.24) | (-5.89) | (-6.11) | (-6.27) | (-4.97) |
| **Leverage** | 39.38*** | 6.18*** | 17.80*** | 21.12*** | 24.44*** | 18.84*** |
| | (4.91) | (3.77) | (4.91) | (4.93) | (4.94) | (4.08) |
| **Profitability** | -31.10*** | -3.36* | -13.07*** | -15.84*** | -18.62*** | -15.31*** |
| | (-3.45) | (-1.72) | (-3.17) | (-3.26) | (-3.33) | (-2.80) |
| Loan Characteristics | Yes | Yes | Yes | Yes | Yes | Yes |
| Time FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Credit Rating FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Loan Purpose FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 4,933 | 4,933 | 4,933 | 4,933 | 4,933 | 4,933 |
| Adjusted $R^2$ | 0.68 | 0.65 | 0.70 | 0.70 | 0.70 | 0.71 |

## Table VII
## Term Loans: Residual from the Revolver Market Regression – Controlling for Borrower Characteristics

This table provides results of a linear regression of AISD or TCB on European market dummies and control variables. For variable definitions see Appendix A. Fixed effects for year, two-digit SIC code, and borrower credit rating as well as other loan characteristics are included but not shown. We report t-values based on standard errors clustered at the borrowing firm in parentheses. ***, **, * denote significance at the 1, 5 and 10 % level, respectively.

| **Sample** | **Term Loans** | **Term Loans** | **Term Loans** | **Term Loans** |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Variable | AISD | AISD | TCB(45%) | TCB(45%) |
| **Europe (1992-2002) (0/1)** | -44.16* | -12.60 | -42.42 | 6.50 |
| | (-1.87) | (-1.15) | (-1.63) | (0.47) |
| **Revolver Residual** | | 1.64*** | | 1.45*** |
| | | (18.77) | | (17.46) |
| **ln(Total Assets)** | 1.84 | -3.55 | 3.72 | -2.26 |
| | (0.44) | (-1.31) | (0.86) | (-0.83) |
| **Market-to-Book** | -12.71*** | -9.53*** | -10.28** | -10.40*** |
| | (-2.63) | (-3.53) | (-2.07) | (-3.49) |
| **Leverage** | -8.64 | -6.14 | -12.66 | 0.34 |
| | (-0.50) | (-0.58) | (-0.73) | (0.03) |
| **Profitability** | -40.12 | 7.43 | -49.57 | 2.40 |
| | (-1.42) | (0.47) | (-1.61) | (0.14) |
| Loan Characteristics | Yes | Yes | Yes | Yes |
| Time FE | Yes | Yes | Yes | Yes |
| Industry FE | Yes | Yes | Yes | Yes |
| Credit Rating FE | Yes | Yes | Yes | Yes |
| Loan Purpose FE | Yes | Yes | Yes | Yes |
| Observations | 878 | 878 | 878 | 878 |
| Adjusted $R^2$ | 0.54 | 0.81 | 0.53 | 0.79 |

## Table VIII
## Credit Lines – 1992 to 2007

This table provides results of a linear regression of loan price terms on European market dummies and control variables. For variable definitions see Appendix A. Fixed effects for year, two-digit SIC code, and borrower credit rating as well as other loan characteristics are included but not shown. We report t-values based on standard errors clustered at the borrowing firm in parentheses. ***, **, * denote significance at the 1, 5 and 10 % level, respectively.

| **Sample** | **Revolver** | **Revolver** | **Revolver** | **Revolver** | **Revolver** | **Revolver** |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Variable | AISD | AISU | UWS(35%) | UWS(45%) | UWS(55%) | TCB(45%) |
| **Europe (1992-2007) (0/1)** | -26.14*** | 2.80*** | -7.33*** | -10.22*** | -13.12*** | -7.70*** |
| | (-6.81) | (2.62) | (-3.89) | (-4.71) | (-5.32) | (-2.86) |
| Loan Characteristics | Yes | Yes | Yes | Yes | Yes | Yes |
| Borrower Characteristics | Yes | Yes | Yes | Yes | Yes | Yes |
| Time FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Credit Rating FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Loan Purpose FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 8,171 | 8,171 | 8,171 | 8,171 | 8,171 | 8,171 |
| Adjusted $R^2$ | 0.69 | 0.65 | 0.70 | 0.70 | 0.70 | 0.71 |

## Table IX
## Term Loans: Residual from the Revolver Market Regression – 1992 to 2007

This table provides results of a linear regression of AISD or TCB on European market dummies and control variables. For variable definitions see Appendix A. Fixed effects for year, two-digit SIC code, and borrower credit rating as well as other loan characteristics are included but not shown. We report t-values based on standard errors clustered at the borrowing firm in parentheses. ***, **, * denote significance at the 1, 5 and 10 % level, respectively.

| **Sample** | **Term Loans** | **Term Loans** | **Term Loans** | **Term Loans** |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Variable | AISD | AISD | TCB(45%) | TCB(45%) |
| **Europe (1992-2007) (0/1)** | -35.35* | -15.56* | -35.31* | -7.79 |
| | (-1.93) | (-1.90) | (-1.75) | (-0.81) |
| **Revolver Residual** | | 1.83*** | | 1.67*** |
| | | (26.76) | | (24.92) |
| Loan Characteristics | Yes | Yes | Yes | Yes |
| Borrower Characteristics | Yes | Yes | Yes | Yes |
| Time FE | Yes | Yes | Yes | Yes |
| Industry FE | Yes | Yes | Yes | Yes |
| Credit Rating FE | Yes | Yes | Yes | Yes |
| Loan Purpose FE | Yes | Yes | Yes | Yes |
| Observations | 1,730 | 1,730 | 1,730 | 1,730 |
| Adjusted $R^2$ | 0.40 | 0.70 | 0.41 | 0.69 |

## Table X
## Credit Lines – Instrumented Equity Volatility

This table provides results of OLS and IV regressions of AISD or TCB on European market dummies and control variables. In the IV specifications the standard deviation of the ratio of borrowers' quarterly book equity to assets ratio, and the standard deviation of the ratio of borrowers' quarterly cash and short-term investment to assets are used as instruments for the borrowers' stock return volatility (first stage results not reported). For variable definitions see Appendix A. Fixed effects for year, two-digit SIC code, and borrower credit rating as well as other loan and borrower characteristics are included but not shown. We report t-values based on standard errors clustered at the borrowing firm in parentheses. ***, **, * denote significance at the 1, 5 and 10 % level, respectively.

| **Sample** | **Revolver** | **Revolver** | **Revolver** | **Revolver** | **Revolver** |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| Variable | AISD | AISD | AISD | USW(45%) | TCB(45%) |
| **Europe (1992-2007) (0/1)** | -26.14*** | -24.80*** | -24.43*** | -9.35*** | -7.03** |
| | (-6.81) | (-6.37) | (-5.46) | (-3.87) | (-2.43) |
| **Equity Volatility** | | 1.18*** | | | |
| | | (13.61) | | | |
| **Predicted Equity Volatility** | | | -0.37 | 0.10 | 0.14 |
| | | | (-0.28) | (0.14) | (0.19) |
| Loan Characteristics | Yes | Yes | Yes | Yes | Yes |
| Borrower Characteristics | Yes | Yes | Yes | Yes | Yes |
| Time Fixed Effects | Yes | Yes | Yes | Yes | Yes |
| Industry Fixed Effects | Yes | Yes | Yes | Yes | Yes |
| Credit Rating Fixed Effects | Yes | Yes | Yes | Yes | Yes |
| Loan Purpose Fixed Effects | Yes | Yes | Yes | Yes | Yes |
| Observations | 8,171 | 6,259 | 6,209 | 6,209 | 6,209 |
| Adjusted $R^2$ | 0.69 | 0.73 | 0.68 | 0.72 | 0.73 |
| Specification | OLS | OLS | IV ($2^{nd}$ stage) | IV ($2^{nd}$ stage) | IV ($2^{nd}$ stage) |

## Table XI
## Term Loans: Residual from the Revolver Market Regression – Instrumented Equity Volatility

This table provides results of OLS and IV regressions of AISD or TCB on European market dummies and control variables. In the IV specifications the standard deviation of the ratio of borrowers' quarterly book equity to assets ratio, and the standard deviation of the ratio of borrowers' quarterly cash and short-term investment to assets are used as instruments for the borrowers' stock return volatility (first stage results not reported). For variable definitions see Appendix A. Fixed effects for year, two-digit SIC code, and borrower credit rating as well as other loan and borrower characteristics are included but not shown. We report t-values based on standard errors clustered at the borrowing firm in parentheses. ***, **, * denote significance at the 1, 5 and 10 % level, respectively.

| **Sample** | **Term Loans** | **Term Loans** | **Term Loans** | **Term Loans** | **Term Loans** |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| Variable | AISD | AISD | AISD | AISD | TCB(45%) |
| **Europe (1992-2007) (0/1)** | -35.35* | -29.60* | -24.16 | -13.50 | -2.37 |
| | (-1.93) | (-1.66) | (-1.25) | (-1.31) | (-0.20) |
| **Equity Volatility** | | 1.50*** | | | |
| | | (7.14) | | | |
| **Predicted Equity Volatility** | | | 3.19* | 1.15 | 1.33 |
| | | | (1.74) | (0.81) | (0.93) |
| **Revolver Regression Residual** | | | | 1.73*** | 1.59*** |
| | | | | (9.91) | (9.29) |
| Loan Characteristics | Yes | Yes | Yes | Yes | Yes |
| Borrower Characteristics | Yes | Yes | Yes | Yes | Yes |
| Time Fixed Effects | Yes | Yes | Yes | Yes | Yes |
| Industry Fixed Effects | Yes | Yes | Yes | Yes | Yes |
| Credit Rating Fixed Effects | Yes | Yes | Yes | Yes | Yes |
| Loan Purpose Fixed Effects | Yes | Yes | Yes | Yes | Yes |
| Observations | 1,730 | 1,347 | 1,327 | 1,327 | 1,327 |
| Adjusted $R^2$ | 0.40 | 0.42 | 0.36 | 0.69 | 0.68 |
| Specification | OLS | OLS | IV ($2^{nd}$ stage) | IV ($2^{nd}$ stage) | IV ($2^{nd}$ stage) |

## Appendix A
## Explanation of Variables

| Variable | Source | Description |
|---|---|---|
| **General** | | |
| Term Loan (0/1) | Dealscan | Loans with type "Revolver/Line < 1 Yr.", "Revolver/Line >= 1 Yr.", "364-Day Facility", "Limited Line" or "Revolver /Term Loan" as indicated in the facility table in DealScan. |
| Revolver (0/1) | Dealscan | Loans with type "Term Loan", "Term Loan A"-"Term Loan H" or "Delay Draw Term Loan" as indicated in the facility table in DealScan. |
| Other Loan (0/1) | Dealscan | Loans that are not classified as either term loans or revolver. |
| Purpose: Takeover (0/1) | Dealscan | Loans with purpose "Takeover" as indicated in the facility table in DealScan. |
| Purpose: Ship, Plane, or SPV Finance (0/1) | Dealscan | Loans with purpose "Aircraft finance" or "Ship finance" as indicated in the facility table in DealScan. |
| Purpose: Project Finance (0/1) | Dealscan | Loans with purpose "Proj. finance" as indicated in the facility table in DealScan. |
| Purpose: CP Backup (0/1) | Dealscan | Loans with purpose "CP backup" as indicated in the facility table in DealScan. |
| **Price Terms** | | |
| AISD | Dealscan | All-In-Spread-Drawn, defined as the sum of the spread over LIBOR or EURIBOR plus the facility fee. |
| AISU | Dealscan | All-In-Spread-Undrawn, defined as the sum of the facility fee and the commitment fee. |
| Spread | Dealscan | Spread over LIBOR, paid on drawn amounts on credit lines |
| Facility Fee | Dealscan | Fee paid on the entire committed amount, regardless of usage. |
| Commitment Fee | Dealscan | Fee paid on the unused amount of loan commitments. |
| Upfront Fee/UF | Dealscan | Fee paid upon completion of a syndicated loan. |
| Utilization fee/UTF | Dealscan | Fee paid on the entire drawn amount once a certain usage threshold has been exceeded |
| Cancellation fee/CAF | Dealscan | Fee paid if the syndicated loan is cancelled before maturity |
| Usage Weighted Spread/UWS | Dealscan | Weighted average of AISD and AISU. |
| Total Cost of Borrowing/TCB | Dealscan | Total cost of borrowing taking into account the spread, the facility fee, the commitment fee, the letter of credit fee, the utilization fee, the cancellation fee and the upfront fee |
| **Non-Price Terms** | | |
| Facility Amount | Dealscan | Facility amount in USD mn as indicated in the field *FacilityAmt* in the facility table in DealScan. |
| Maturity 1-3yr (0/1) | Dealscan | A dummy variable which equals one if the loan maturity is between 1 and 3 years and zero otherwise. |
| Maturity 3-6yr (0/1) | Dealscan | A dummy variable which equals one if the loan maturity is between 3 and 6 years and zero otherwise. |
| Maturity > 6yr (0/1) | Dealscan | A dummy variable which equals one if the loan maturity larger than 6 years and zero otherwise. |
| Secured (0/1) | Dealscan | Indicates whether the loan is secured by collateral. |
| **Borrower characteristics** | | |
| Total assets | Compustat | Total assets in USD mn. |
| Leverage | Compustat | Ratio of book value of total debt to the book value of assets. |
| Profitability | Compustat | Ratio of EBITDA to sales. |
| Market-to-book | Compustat | Ratio of (book value of assets – book value of equity + market value of equity) to book value of assets. |
| Europe (0/1) | Dealscan | A dummy variable which equals one if the borrower is a European firm and zero otherwise. |
| Equity Volatility | Datastream, CRSP | Annualized standard deviation of firms' weekly stock returns for each calendar year. |
| Book Equity Volatility | Compustat | The standard deviation of the ratio of borrowers' quarterly book equity to assets ratio. Calculated using a rolling window of eight quarters. |
| Cash & STI Volatility | Compustat | The standard deviation of the ratio of borrowers' quarterly cash and short term investment to assets. Calculated using a rolling window of eight quarters. |
| Rating: AAA…B | S&P | A dummy variable which equals one if the borrower has an S&P rating of AAA ... B at the time of the loan issue. |

## Appendix B
## Fees in the US and the European Loan Market

### B.I. Descriptive Statistics

This table provides summary statistics for loan price terms separately for the US and the European market. Panel A reports statistics for borrowers that have an investment grade rating at the time of the loan issue. Panel B reports statistics for borrowers that have a junk rating at the time of the loan issue. For variable definitions see Appendix A.

| | Revolver | | | |
|---|---|---|---|---|
| | US Market | | European Market | |
| Variable | Observations | Mean | Observations | Mean |
| **Panel A: Investment Grade** | | | | |
| AISD | 63.51 | 3,733 | 49.70 | 228 |
| AISU | 14.47 | 3,733 | 19.26 | 228 |
| Commitment Fee | 23.72 | 769 | 19.59 | 215 |
| Facility Fee | 11.77 | 3,029 | 10.44 | 13 |
| Utilization Fee | 12.02 | 1,013 | 4.80 | 99 |
| Cancellation Fee | 130.55 | 9 | #NA | #NA |
| Upfront Fee | 24.27 | 3,733 | 36.42 | 228 |
| **Panel B: Junk Grades** | | | | |
| AISD | 192.51 | 1,750 | 204.66 | 30 |
| AISU | 40.19 | 1,750 | 57.55 | 30 |
| Commitment Fee | 41.45 | 1,509 | 56.56 | 25 |
| Facility Fee | 26.51 | 285 | 51.78 | 7 |
| Utilization Fee | 19.41 | 43 | 15.00 | 3 |
| Cancellation Fee | 149.52 | 98 | #NA | #NA |
| Upfront Fee | 51.73 | 1,750 | 89.32 | 30 |

### B.II. Total Cost of Borrowing Definition

$$TCB = \text{Upfront Fee / Loan Maturity in Years} \quad (B.1)$$

$$+ \text{Facility Fee} + (1\text{-PDD}) \times \text{Commitment Fee} + \text{PDD} \times \text{Spread} \quad (B.2)$$

$$+ \text{PDD} \times \text{Prob}(\text{Utilization} > \text{UtilizationThreshhold} \mid \text{Usage} > 0) \times \text{Utilization Fee} \quad (B.3)$$

$$+ \text{Prob}(\text{Cancellation}) \times \text{Cancellation Fee} \quad (B.4)$$

The first term annualizes the one-time upfront fee using the contractual maturity of the loan. Using the contractual maturity provides a conservative estimate of the annualized impact of the upfront fee on the total cost of borrowing, given that a large fraction of loans are refinanced prior to the contractual maturity. The second term is a weighted average of the AISU (annual facility fee plus annual commitment fee) and the AISD (annual facility fee plus annual spread). As discussed in Section X, we use a PDD of 45%. The third term adds the

annual utilization fee a borrower has to pay if usage exceeds a certain threshold, usually either 33% or 50% of the credit limit. The utilization fee has to be paid on the whole used amount of the credit line and not just on the utilization part above the threshold. Following BSS (2013), we calibrate our model assuming that there is a 90% likelihood that a dollar drawn is subject to the utilization fee using statistics provided by Mian and Santos (2012). Finally, the last term reflects the cost of cancellation weighted by the annual probability that a cancellation occurs and in our examples we set this probability equal to 0.5%.

BSS (2013) report, that the only fee type with an inaccurate coverage of fees in the Dealscan database is the upfront fee. In the US over 80% of loan contracts contain an upfront fee, while this fraction is significantly lower in the Dealscan database.[14] However, BSS (2013) also report that the information on the upfront fee is accurate if it is reported in Dealscan. We follow BSS (2013) and deal with this issue in two ways: (i) we predict the upfront fee if it is missing in Dealscan using all control variables from Table II column (1); (ii) we only use observations with a non-missing upfront fee. We report the results using the predicted upfront fee, however, the results are qualitatively similar if we restrict our analysis to all loans with a non-missing upfront fee if not explicitly stated otherwise.[15] We treat missing observations as zero for the other fee types in the following analysis.

[14] See BSS (2013) who compare SEC filings to DealScan and find this discrepancy.
[15] These results are available from the authors upon request.

## B.III. AISD vs. TCB Decomposition

This table provides results of a linear regression of price terms on European market dummy and control variables. For variable definitions see Appendix A. Fixed effects for year, one-digit SIC code, and borrower credit rating as well as other loan characteristics are included but not shown. We report t-values based on standard errors clustered at the borrowing firm in parentheses. ***, **, * denote significance at the 1, 5 and 10 % level, respectively.

| **Sample** | **Revolver** | **Revolver** | **Revolver** | **Revolver** | **Revolver** |
|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) |
| Variable | **TCB(45%)/ AISD** | **AISU/ AISD** | **UF/ AISD** | **UTF/ AISD** | **CAF/ AISD** |
| **Europe (1992-2002) (0/1)** | 0.33*** | 0.14*** | 0.28** | -0.01 | -0.00 |
| | (3.42) | (13.94) | (2.28) | (-1.43) | (-1.07) |
| Loan Characteristics | Yes | Yes | Yes | Yes | Yes |
| Time FE | Yes | Yes | Yes | Yes | Yes |
| Industry FE | Yes | Yes | Yes | Yes | Yes |
| Credit Rating FE | Yes | Yes | Yes | Yes | Yes |
| Loan Purpose FE | Yes | Yes | Yes | Yes | Yes |
| Observations | 5,741 | 5,741 | 5,741 | 5,741 | 5,741 |
| Adjusted $R^2$ | 0.33 | 0.36 | 0.36 | 0.18 | 0.08 |

Table B.III. reports the results of multivariate regressions of the TCB components on a European-dummy and covariates associated with the riskiness of loans and borrowers to analyze which components explain the difference between TBC and AISD. Column 2 shows that the AISU is significantly higher for European loans also in a multivariate analysis (14% with a t-stat of 14). Column 3 shows that the upfront fees are approximately 30% higher in the European market. Column 4 and column 5 show that the utilization and the cancellation fees are, if anything, lower in the European market, hence they cannot explain the difference between AISD and TCB.

## Appendix C
## Instrumented Equity Volatility: Rated vs. Non-Rated Companies

### C.I. Revolver Sample

This table provides results of OLS and IV regressions of AISD on European market dummies and control variables. In the IV specifications the standard deviation of the ratio of borrowers' quarterly book equity to assets ratio, *Book Equity Volatility*, and the standard deviation of the ratio of borrowers' quarterly cash and short-term investment to assets, *Cash & STI Volatility*, are used as instruments for the borrowers' stock return volatility. For variable definitions see Appendix A. Fixed effects for year, two-digit SIC code, and borrower credit rating as well as other loan and borrower characteristics are included but not shown. We report t-values based on standard errors clustered at the borrowing firm in parentheses. ***, **, * denote significance at the 1, 5 and 10 % level, respectively.

| | **Rated Companies** | | | | **Non-Rated Companies** | | | |
|---|---|---|---|---|---|---|---|---|
| **Sample** | **Revolver** | **Revolver** | **Revolver** | **Revolver** | **Revolver** | **Revolver** | **Revolver** | **Revolver** |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Variable | AISD | AISD | Equity Volatility | AISD | AISD | AISD | Equity Volatility | AISD |
| **Europe (1992-2007) (0/1)** | -26.14*** | -24.80*** | -0.43 | -24.43*** | -37.18*** | -30.94*** | -0.20 | -31.18*** |
| | (-6.81) | (-6.37) | (-0.39) | (-5.46) | (-10.75) | (-7.89) | (-0.15) | (-5.59) |
| **Equity Volatility** | | 1.18*** | | | | 0.95*** | | |
| | | (13.61) | | | | (14.67) | | |
| **Predicted Equity Vola** | | | | -0.37 | | | | 3.30*** |
| | | | | (-0.28) | | | | (5.44) |
| **Book Equity Volatility** | | | 0.05 | | | | 0.07*** | |
| | | | (1.45) | | | | (3.60) | |
| **Cash & STI Volatility** | | | 0.10* | | | | 0.21*** | |
| | | | (1.74) | | | | (5.08) | |
| Loan Characteristics | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Borrower Characteristics | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Time Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Credit Rating Fixed Effects | Yes | Yes | Yes | Yes | No | No | No | No |
| Loan Purpose Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 8,171 | 6,259 | 6,209 | 6,209 | 9,004 | 6,670 | 6,347 | 6,347 |
| Adjusted $R^2$ | 0.69 | 0.73 | 0.54 | 0.68 | 0.52 | 0.55 | 0.43 | 0.33 |
| Specification | OLS | OLS | IV (1st stage) | IV (2nd stage) | OLS | OLS | IV (1st stage) | IV (2nd stage) |

## C.II. Term Loan Sample

This table provides results of OLS and IV regressions of AISD on European market dummies and control variables. In the IV specifications the standard deviation of the ratio of borrowers' quarterly book equity to assets ratio, *Book Equity Volatility*, and the standard deviation of the ratio of borrowers' quarterly cash and short-term investment to assets, *Cash & STI Volatility*, are used as instruments for the borrowers' stock return volatility. For variable definitions see Appendix A. Fixed effects for year, two-digit SIC code, and borrower credit rating as well as other loan and borrower characteristics are included but not shown. We report t-values based on standard errors clustered at the borrowing firm in parentheses. ***, **, * denote significance at the 1, 5 and 10 % level, respectively.

| | **Rated Companies** | | | | **Non-Rated Companies** | | | |
|---|---|---|---|---|---|---|---|---|
| **Sample** | **Term Loans** | **Term Loans** | **Term Loans** | **Term Loans** | **Term Loans** | **Term Loans** | **Term Loans** | **Term Loans** |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Variable | AISD | AISD | Equity Volatility | AISD | AISD | AISD | Equity Volatility | AISD |
| **Europe (1992-2007) (0/1)** | -21.23* | -19.95* | -1.42 | -21.44* | -75.46*** | -68.61*** | -8.81*** | -37.18* |
| | (-1.88) | (-1.71) | (-0.67) | (-1.69) | (-10.58) | (-8.20) | (-4.11) | (-1.86) |
| **Equity Volatility** | | 1.64*** | | | | 0.82*** | | |
| | | (8.56) | | | | (7.65) | | |
| **Predicted Equity Vola** | | | | 0.32 | | | | 5.30*** |
| | | | | (0.22) | | | | (3.26) |
| **Book Equity Volatility** | | | 0.07* | | | | 0.10*** | |
| | | | (1.66) | | | | (3.02) | |
| **Cash & STI Volatility** | | | 0.19* | | | | 0.15** | |
| | | | (1.89) | | | | (2.18) | |
| Loan Characteristics | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Borrower Characteristics | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Time Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Credit Rating Fixed Effects | Yes | Yes | Yes | Yes | No | No | No | No |
| Loan Purpose Fixed Effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 2,860 | 2,204 | 2,167 | 2,167 | 4,667 | 3,139 | 2,872 | 2,872 |
| Adjusted $R^2$ | 0.39 | 0.42 | 0.48 | 0.39 | 0.35 | 0.39 | 0.42 | 0.37 |
| Specification | OLS | OLS | IV ($1^{st}$ stage) | IV ($2^{nd}$ stage) | OLS | OLS | IV ($1^{st}$ stage) | IV ($2^{nd}$ stage) |