Chapter 14

LOAN CONTRACT TERMS

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Abstract

Loan contract terms refer to the price and nonprice terms associated with a corporate loan deal between a borrower and a lender or a syndicate of lenders. The specification of loan contract terms differs across loans. These differences are attributable to the tradeoffs between values of loan contract terms that the borrower chooses when negotiating the loan contract, as well as the purpose of the loan and borrower and lending syndicate characteristics. Methodological issues that arise when investigating the relations between loan contract terms include allowing for loan contract terms that are determined simultaneously and accurately estimating credit risk.

Keywords: loan contract terms; corporate loans; syndicated loans; loan pricing corporation; maturity; collateral; credit spread; syndicate size; simultaneity; credit risk

14.1. Introduction

Loan Contract Terms refer to the price and nonprice terms associated with a corporate loan deal between a borrower and a lender or a syndicate of lenders.[1] Corporate loan deals are composed of one or more loans, designated *loan facilities*, and loan contract terms can vary across facilities. Price terms include the rate spread over the risk-free rate, typically the prime rate or LIBOR, and fees such as upfront, annual, cancellation, and commitment fees. Nonprice terms include deal and facility size, maturity, collateral, financial and nonfinancial covenants, and performance pricing covenants. Other characteristics across which loans differ include whether the loan is a revolver or term loan, the seniority of the loan, and the size and concentration of the lending syndicate, among others.[2]

The specification of loan contract terms differs across loans. These differences are attributable to the tradeoffs between values of loan contract terms that the borrower chooses when negotiating the loan contract, as well as the purpose of the loan and borrower and lending syndicate characteristics.[3] Melnik and Plaut (1986) model loan commitment contracts as a ''package'' of negotiated terms.[4] In their model, the loan commitment contract is described by the vector $B[\boldsymbol{L}^*, \boldsymbol{T}, \boldsymbol{m}, \boldsymbol{k}, \boldsymbol{C}]$ where $\boldsymbol{L}^*$is the amount of credit the lender is willing to provide, $\boldsymbol{T}$ is the maturity of the contract, $\boldsymbol{m}$ is the rate spread, $\boldsymbol{k}$ is the loan commitment fee rate, and $\boldsymbol{C}$ is the collateral. Borrowers can choose to tradeoff less favorable specification of some contract terms in exchange for more favorable specification of other contract terms. Melnik and Plaut (1986) empirically test for the existence of such tradeoffs through investigating whether loan commitment size is related to other loan contract features, and find support for the hypotheses that lenders are willing to provide a larger loan commitment in exchange for a higher

spread or more collateral. They also find support for the hypothesis that lenders are willing to provide larger loan commitments in exchange for a continuing customer relationship. As well, Melnik and Plaut (1986) identify a positive relation between loan commitment size and firm characteristics such as proxies for firm credit rating and firm size.

While Melnik and Plaut's (1986) study provides important early insight into the relation between loan contract terms, subsequent studies contribute to a more complete understanding. One relation that has received attention is the relation between loan spreads and maturity. Two competing hypotheses explain the nature of the relation. The *tradeoff hypothesis* forecasts a positive relation between corporate loan spreads and maturity, while the *credit quality hypothesis* forecasts a negative relation. The positive relation forecasted by the tradeoff hypothesis is based on the observation that, *ceteris parabis*, borrowers prefer to borrow for longer periods to avoid the costs associated with liquidation at maturity, while lenders prefer to lend for shorter periods to avoid agency problems.[5] The negative relation forecasted by the credit quality hypothesis is based on the argument that lenders direct riskier borrowers to shorter-maturity loans, and less-risky borrowers to longer-maturity loans. Because less-risky borrowers are less likely to default, the corporate loan spreads they pay are lower than the spreads paid by riskier borrowers, hence the relation between loan spreads and maturity is forecasted to be negative.[6]

Some empirical evidence identifies a negative relation between loan spreads and maturity, which supports the credit quality hypothesis. Strahan (1999) performs regression estimation of measures of spread against maturity and other regressors, and identifies a statistically significant negative coefficient associated with his measure of maturity for both lines of credit and term loans. Dennis et al. (2000) identify a negative relation as well.[7] But there is also evidence that longer maturity loans are associated with higher spreads (Helwege and Turner, 1999; Coleman et al., 2002), supportive of the tradeoff hypothesis. Gottesman and Roberts (2004) argue that both hypotheses can coexist: the credit quality hypothesis at the portfolio level, and the tradeoff hypothesis at the individual firm level. Gottesman and Roberts (2004) test a matched pair sample consisting of longer and shorter maturity loan facilities between identical lender syndicates and individual borrowers. Both loan facility elements of each matched pair are segments of identical larger loan deals; hence firm and temporal characteristics are controlled. Through the use of these controls any effects associated with the credit quality hypothesis are eliminated, as both elements of each matched pair are associated with the same firm, and, therefore, are characterized by identical credit quality. Gottesman and Roberts (2004) identify a positive relation between loan spreads and maturity using their methodology, and argue that the tradeoff hypothesis is supported at the firm level, while the credit quality hypothesis describes reality at the loan portfolio level.

Another relation that has received attention is the relation between loan spreads and collateralization. There is extensive evidence that loans that are collateralized are associated with higher spreads than noncollateralized loans (Berger and Udell, 1990, 1995; Dennis et al., 2000; John et al., 2003; Gottesman and Roberts, 2005). Superficially, these finding are odd: shouldn't collateralization reduce the risk associated with the loan, and therefore lead to lower spreads? One explanation for the existence of higher spreads for collateralized loans is that riskier borrowers are more likely to be forced by lenders to collateralize than less risky borrowers, as suggested in theoretical models and empirical papers.[8] Hence, the higher spreads associated with collateralized loans arise because of the riskier nature of these borrowers, even after the risk-reducing effects of collateralization (Berger and Udell, 1990; Pozzolo, 2002). An alternative explanation for the higher spreads associated with collateralized loans is unrelated to the risk characteristics of the borrower; instead, John et al.'s

(2003) management-consumption hypothesis argues that the higher spreads are the result of agency problem associated with collateralized debt. Support for this hypothesis comes from empirical evidence of higher *ex ante* spreads (e.g. John et al., 2003; Gottesman and Roberts, 2005).

Empirical tests identify a number of additional relations between loan contract terms. For example, there is evidence that larger and less leveraged firms are more likely to borrow revolving loans rather than term loan (Coleman, A.D.F., Esho, N., and Sharpe, I.G. 2002). Further, loans that include a performance-pricing covenant have significant lower spreads than loans without such a covenant (Asquith et al., 2002), though there is also evidence that this result is limited to accounting-based performance pricing covenants (Panyagometh et al., 2004). Accounting-based performance-pricing covenants are associated with collateralization, longer maturity, and riskier loans (Doyle, 2003). There is evidence of a complementary pattern between performance pricing and other covenant provisions, though performance-pricing covenants are designed to deal with the scenario where the borrower's credit improves, while other covenants are designed for scenarios where credit deteriorates (Beatty et al., 2002).

14.2. Characteristics of the Lending Syndicate

Corporate loans are provided by either a sole lender or by a syndicate of lenders; indeed, syndicates of lenders provide a large proportion of corporate loans. The characteristics of the lending syndicate are important to both the lender and the borrower, and a lending syndicate structure that is optimal for the lenders maybe suboptimal for the borrower. We therefore expect tradeoffs between the syndicate structure and other loan contract terms. The arranging bank in a syndicate plays an important role in influencing syndicate size, concentration, and negotiated loan contract terms. As Lee and Mullineaux (2001) discuss, arranging banks control the size and concentration of the syndicate in a number of ways. First, the arranger chooses which lenders to invite into the syndicate. Second, the arranger specifies participation bracket size and fee. Third, the arranger can close the syndication before the end of the offering period.

Lee and Mullineaux (2001) provide arguments as to why syndicate size is important. Larger syndicates can be costly, as unanimous agreement by all participants is required to permit change to the original loan agreement. Hence, should the borrower face financial distress, larger syndicates require costlier renegotiations and are more likely to result in failure to reach unanimous agreement. Because riskier firms are more likely to face financial distress, smaller syndicates are highly desirable for loans to riskier borrowers. Yet the arranging bank may prefer larger syndicates as it allows them to provide participation opportunities to other lenders.

Borrowers may prefer syndicated loans to avoid situations where a sole-lender monopolizes proprietary information about the borrower. As Boot (2000) notes, banks can use their monopoly over proprietary information about the borrower to charge a higher rate than would be expected in a competitive environment (the hold-up problem).[9] One solution for the borrower is to engage in multiple bank relationships and to ensure the availability of competing sources of loans (von Thadden, 1992).[10] Syndicated loans can be perceived as a source of multiple relationships. Note, however, that the more the lenders, the more likely that the proprietary information will be leaked. Therefore, Bhattcharya and Chiesa (1995) contend that a firm will form less relationships if it holds valuable proprietary information that it does not wish to leak.[11] Hence, there are tradeoffs associated with multiple banking relationships as well. Empirical evidence suggests that a relationship with a single lender is associated with superior credit availability. There is also mixed empirical evidence regarding the interaction between loan rates and the number of bank relationships in which the borrower is engaged.[12] As for concentration, concentrated loan share gives participants the incentives to monitor

and renegotiate in good faith, and is less likely to result in free riding. This suggests that concentrated syndicates are particularly desirable when there are information asymmetries and potential agency issues that require monitoring. Yet participants may wish to limit their exposure, particularly for loans to risky borrowers.

Lee and Mullineaux (2001) perform empirical tests and find that syndicate size is positively related to the information available about the borrower, the term to maturity, and the arranging bank's reputation. Syndicate concentration is positively related to information asymmetry and to the presence of security. Concentration is negatively related to borrower credit quality and lead bank reputation. As well, syndicate size is larger when resale activities are limited and less concentrated. Dennis and Mullineaux (2000) and Jones et al. (2000) find that the share of the syndicated loan held by the arranging bank is negatively related to loan quality. Esty and Megginson (2003) find that syndicate size is larger and more diffused in countries where lenders cannot rely on legal enforcement mechanisms.

14.3. Methodological Issues

14.3.1. Simultaneity

Dennis et al. (2000) criticize the empirical literature on loan contract terms, arguing that studies that focus on single contract features ignore the econometric issues that arise if contract features are determined simultaneously. For example, Dennis et al. (2000) note that maturity and collateral may be related to common exogenous factors such as credit quality or agency costs. While the simultaneity issue can be resolved through excluding other loan contract terms from OLS estimation, such an approach does not permit analysis of the tradeoff across loan contract terms. To account for simultaneity, Dennis et al. (2000) perform their tests through estimating a simultaneous equation model using two-stage least squares (2SLS) estimation, for a sample of revolver loans, specified as follows:

$$\text{Duration} = \gamma_{\text{DS}}\text{Secured} + \beta_1 \text{X}_1 + e_1 \tag{14.1}$$

$$\text{Secured} = {}_{\gamma\text{SD}}\ \text{Duration} + \beta_2 \text{X}_2 + e_2 \tag{14.2}$$

$$\begin{aligned}\text{All-In-Spread} &= \gamma_{\text{AD}}\text{Duration} \\ &+ \gamma_{\text{AS}}\text{Secured} + \gamma_{\text{AC}}\text{Comfee} + \beta_3 \text{X}_3 + e_3\end{aligned} \tag{14.3}$$

$$\begin{aligned}\text{Comfee} &= \gamma_{\text{CD}}\text{Duration} + \gamma_{\text{CS}}\text{Secured} \\ &+ \gamma_{\text{CA}}\text{All-In-Spread} + \beta_4 \mathbf{X}_4 + e_4\end{aligned} \tag{14.4}$$

where *duration* is maturity; *secured* is a collateralization dummy; *all-in-spread* is the basis point coupon spread over LIBOR plus the annual fee and upfront fee, spread over the life of the loan; *comfee* is the commitment fee; and **X** is a vector of other control variables that measure firm characteristics such as risk and size, and loan characteristics such as loan purpose and structure. This model captures the tradeoffs suggested by Melnik and Plaut (1986) through two bi-directional relations: between duration and security, and between spreads and fees. It also allows the values of duration and security to influence spreads and fees.

The 2SLS estimation performed by Dennis et al. (2000) provides evidence of a positive relation between maturity and collateralization, and between all-in-spreads and commitment fees. As noted earlier, they also find evidence that spreads are negatively related to maturity and positively related to collateralization. To demonstrate that accounting for simultaneity is critical, Dennis et al. (2000) repeat their estimation using single equation estimation and fail to find evidence of the relation between maturity and collateralization. Further, single equation estimation results in evidence of a positive relation between commitment fee and both maturity and collateralization. These results differ from the results when 2SLS estimation is used. Dennis et al. (2000) use the differences between the results for single equation and 2SLS estimation as evidence that ignoring simultaneity can "... produce potentially biased and inconsistent estimates of the relationships." (p. 107).

14.3.2. Measures of Risk

The credit riskiness of the borrower strongly influences the negotiated package of terms. Most obviously, we expect a lender to demand a higher spread from a borrower with a higher probability of default, to compensate for the additional risk with which the lender is burdened. Riskiness also influences important loan contract terms such as maturity and collateralization, as discussed earlier. The influence of credit riskiness on loan contract terms requires that it be controlled when relating loan contract terms to each other; yet riskiness of the borrower is often difficult to estimate.

One measure that is frequently used to control for the borrower's riskiness is the borrower's credit rating. However, credit ratings are an inadequate control for risk, as they do not provide useful information about short-and medium-term likelihood of default. Ratings tend to overestimate risk when the economy is strong and underestimate risk when the economy is weak, due to systematic variations in the relation between ratings and risk. This effect is further exacerbated by change in the risk-free rate of interest as the economy changes.[13] Other measures of credit risk based on long-term averages, such as the variance of earnings, are also inadequate for similar reasons.

One alternative is to use an options theoretic approach to estimate default risk in the spirit of Merton (1974). A relatively easy-to-implement method of estimating the implied probability of default is described by Saunders and Allen (2002, Chapter 4) and Allen and Peristiani (2004). The implied default probability is $N(-\mathbf{DD}_{it})$, where

$$\mathbf{DD}_{it} = \frac{\ln\left(\frac{\mathbf{V}_{Ait}}{\mathbf{L}_{it}}\right) + \mathbf{T}\left(\mathbf{r}_t + 0.5\sigma_{Ait}^2\right)}{\sigma_{Ait}\sqrt{\mathbf{T}}}. \tag{14.5}$$

In this equation, borrower i's asset value and asset volatility at time t, V_{Ait} and σ_{Ait}, are identified through solving the following system of nonlinear equations:

$$\mathbf{V}_{Eit} = \mathbf{V}_{Ait}N(\mathbf{DD}_{it}) - \mathrm{e}^{-r_t T}\boldsymbol{L}_{it}N(\mathbf{DD}_{it} - \sigma_{Ait}\sqrt{\mathbf{T}}), \tag{14.6}$$

$$\sigma_{Eit} = \frac{V_{Ait}}{\mathbf{V}_{Eit}}N(\mathbf{DD}_{it})\sigma_{Ait}, \tag{14.7}$$

where $\mathbf{V}_{Eit}$ is the market value of borrower i's equity at time t, $\mathbf{L}_{it}$ the borrower's debt, $\mathbf{r}_t$ the risk-free rate, σ_{Eit} the borrower i's equity volatility at time t, T the period, and $N(\ )$ the normal distribution. Allen and Peristiani note that the implied default probability estimated using the above methodology does not exactly correspond to the actual probability due to the normality assumption. However, they argue that this measure reflects variations in the probability of default. These characteristics make it a useful companion to measures of average long-term risk such as credit ratings.

NOTES

1. We primarily focus on the literature related to private loans in this discussion.
2. Many studies use data from the Loan Pricing Corporation's (LPC) Dealscan database, which details price and nonprice loan contract terms associated with syndicated loans. The LPC Dealscan database reports a number of measures of spread for each loan facility including the prime spread; the LIBOR spread; and measures that combine spread and fees.
3. The values of loan contract terms can also be influenced by macroeconomic factors, as well as loan market factors such as regulation and competitiveness. For example, see Berger and Hannan (1989), Petersen and Rajan (1995), Hannan (1997), Covitz and Heitfield (1999), Boot and Thakor (2000), Beck et al. (2004), among many others.
4. Other early papers that relate demand for credit to loan contract terms include Azzi and Cox (1976), Arzac et al. (1981), and Koskela (1983).
5. Agency problems associated with longer maturity loans include asset substitution and underinvestment. See Myers (1977) and Barnea et al. (1980). Also see signaling arguments in Flannery (1986) and Kale and Noe (1990), which suggest that less risky borrowers will choose shorter loans.
6. Dennis et al. (2000) review and develop a number of hypotheses that relate maturity and collateral to other borrower characteristics besides credit quality; for example, their tax hypothesis predicts that maturity is inversely related to the firm's marginal tax rate, and positively related to the slope of the yield curve.

7. Also see Berger and Udell (1990) and Guedes and Opler (1996).
8. See Boot et al. (1991), Bester (1994), Coco (1999), Hester (1979), Berger and Udell (1990, 1995), Carey et al. (1998), and Harhoff and Korting (1998). Note that others argue that less risky borrowers are more likely to collateralize. See Bester (1987, 1985), Chan and Kanatas (1985) and Besanko and Thakor (1987).
9. Also see Rajan (1992).
10. Degryse and Ongena (2001) empirically investigated publicly listed Norwegian firms, and found that firm profitability is negatively related to the number of relationships that the firm has with banks. They interpret this to suggest that young firms begin with bilateral relationships, and remain with the bank if successful. Mediocre firms, on the other hand, develop multiple banking relationships.
11. Also see Bolton and Scharfstein (1996) and Detragiache et al. (2000).
12. See Degryse and Ongena (2001).
13. See Standard and Poor's (2004) and Treacy and Carey (1998).

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