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The Corporate Choice between Public Debt, Bank Loans, Traditional Private Debt Placements, and 144A Debt Issues

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Abstract

The main purpose of this study is to examine the determinants of the corporate choice between different forms of debt financing. By analyzing the most comprehensive sample of U.S. corporate debt issues to date, I find that firms that issue 144A debt have significantly lower credit quality and higher information asymmetry than firms that issue traditional non-bank private debt. Further, the study shows that traditional private placements, rather than bank loans, are the favorite private debt source for firms with good credit quality. I also show that the firm characteristics of traditional private debt issuers have significantly changed after 1990 through to 2003. My results suggest the following pecking order of debt choices which is conditional on credit quality. High credit quality firms prefer public bond offerings and small firms, with good credit quality, are more likely to issue traditional private debt. A large group of firms characterized by moderate credit quality make extensive use of bank loans and poor credit quality firms preferentially issue 144A debt.

JEL Classifications: G32; G21

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1. Introduction

Debt is the major source of capital for U.S. firms. In 2003 the aggregate amount of equity issued by U.S. firms was $106 billion while the aggregate amount of debt issued was $1.6 trillion, about fifteen times larger. Even after removing debt issues used to refinance old debt by assuming a new issue growth rate of five percent as suggested by Henderson et al. (2006), the amount of new debt issued in 2003 was approximately $460 billion.[1]

Moreover, in contrast to the equity market, the private debt market dominates the public debt market in size. Of the $106 billion of equity issued in 2003, only $19 billion was private (18%). Alternatively, of the $1.6 trillion of corporate debt issued in the same year, $1.1 trillion was private (69%). Within the private debt market firms can choose among different alternatives, such as bank loans, traditional private placements, and 144A issues.[2]

This study presents a thorough examination of the determinants of the firm choice between all these different types of private debt and public debt by making use of the most comprehensive sample of U.S. corporate debt issues to date. Throughout this analysis I present novel evidence that challenges the conventional view of non-bank traditional private placements as the source of funds for poor credit quality firms (e.g., Denis and Mihov (2003)).

Before the introduction of 144A debt in 1990, firms often placed high-yield private debt securities to a limited group of institutional investors, usually insurance companies, with an

[1] Results presented in previous studies confirm the predominance of debt over equity as source of capital for U.S. firms. For instance, Bhojraj and Sengupta (2003) report that the aggregate value of public debt issues in U.S. was $651 billion in 1996 and $1 trillion in 1998 while the value of new equity issues was $122 billion in 1996 and $126 billion in 1998.

[2] This study refers to Rule 506 and regulation D private placements as traditional private placements. I report a description of non-bank private debt characteristics in Section 2.1.

agreement to register the securities promptly and make them tradable (Johnson (1991)). However, the beginning of the 1990s experienced a drastic reduction of below-investment-grade private issues. This contraction in the availability of credit in the private debt market was due to a growing reluctance of insurance companies to invest in high-risk debt securities in a period when low-asset quality, a change in regulatory requirements, and runs on a few insurers raised concerns about the solvency of insurance companies (Carey et al. (1993)). Since the 144A debt market can be easily used to issue speculative-grade debt that can be subsequently registered (Fenn (2000)), 144A bonds might have replaced traditional private placements of low-quality, high-risk debt.

The results of this study show that firms which preferentially issue 144A debt are significantly different from firms that privately place debt securities without using the 144A rule. Firms that issue 144A debt are characterized by lower credit quality and higher information asymmetry than firms that issue traditional non-bank private debt. In addition, I show that firms issuing traditional private placements after the introduction of the 144A rule (i.e., after 1990) have significantly higher credit quality than firms issuing traditional private placements before the introduction of the 144A rule. Overall, the results of this study provide suggestive evidence that 144A debt might have replaced traditional private placements of high-risk debt after the credit crunch in the traditional private debt market for speculative-grade debt at the beginning of the 1990s.

Another main finding of the paper is that bank loans are not the preferred private debt source for good credit quality firms. I find that firms with good credit quality that do not access the public market mainly because of flotation costs and information asymmetry are more likely to use traditional private placements rather than bank loans. This finding is consistent with the hypothesis that traditional private debt investors might be willing to commit their capital only to

high credit quality firms with low risk of default since they cannot freely trade the debt securities for at least one year from the purchasing date, and in many cases they lend personal funds to the borrowing firm. An additional explanation for the difference in credit quality between bank borrowers and non-bank traditional private debt issuers is related to the ability of bank debt to potentially mitigate costs of information asymmetry better than traditional private debt. Banks tend to maintain long-term relationships with borrowing firms and accumulate soft information about these firms (Fama (1985), Diamond (1991)). Banks are also able to quickly renegotiate loans and therefore could have superior ability to contain financial losses in case of borrowers' financial distress than non-bank traditional private lenders.

Overall, the results of this study suggest the existence of a pecking order of debt choices conditional on credit quality which presents important differences from the one reported by Denis and Mihov (2003) who find that high credit quality firms are more likely to issue public debt while low credit quality firms preferentially issue non-bank private debt (traditional private debt along with 144A debt). High credit quality firms prefer public bond offerings, good credit quality firms that are not large enough to overcome the barrier created by flotation costs are more likely to raise capital through traditional private debt offerings, a large group of firms characterized by moderate credit quality make extensive use of bank loans, and poor credit quality firms preferentially issue 144A debt.

As in Denis and Mihov (2003), I analyze the incremental debt issue decision. This approach has several advantages. First, the incremental approach links the borrowing decision of the firm with variables measured just prior to the borrowing decision allowing the analysis of the effect of time-variation in firm characteristics on the debt choice. Second, the logistic analysis that derives from this approach mimics the incremental managerial decisional process in the context of capital structure decisions allowing a better assessment of the factors that influence the corporate debt choice. Finally, the analysis of incremental debt offerings does not require the

assumption that the firm is observed at its optimal debt mix at all times, and it provides meaningful results even when the incremental debt decision represents a deviation from the optimal mix of debt claims. On the other hand, this method is not the most appropriate for testing theories that analyze the optimal debt mix in relation to the asset mix of the firm, and should be regarded as a complement to studies on the optimal mix of debt claims which examine leverage instead of incremental debt choices.

This paper is organized as follows. Section 2 presents the hypotheses and describes the institutional characteristics of non-bank private placements. Section 3 describes the variables of interest and the sample construction process. Section 4 provides descriptive statistics and univariate tests. Section 5 examines the firm's choice between different types of debt in a multivariate setting. Section 6 presents additional tests including a robustness check. Section 7 concludes with a summary and a discussion of the results.

2. The choice between private and public debt

2.1 Characteristics of non-bank private placements and the evolution of the private debt placement market

Traditional private placements of debt securities are conducted pursuant to Section 4(2) of the 1933 Securities Act or to Rule 506 of regulation D. Under these rules, firms can issue an unlimited amount of securities to an unlimited number of accredited investors and up to 35 sophisticated investors.[3] Firms typically place debt privately with high net worth individual investors, private investment firms, insurance companies, and banks. Even though insurance companies are important players in the traditional private placement market, they are not as

[3] Accredited investors are investors with net worth of at least $2,500,000 or income of at least $250,000. Sophisticated investors are investors whom a company reasonably believes have adequate knowledge and experience in financial and business matters to evaluate the securities offered for sale.

dominant as they were before the private debt market credit crunch that took place at the beginning of the 1990s (Carey et al. (1993)). The broker who brings issuer and investors together is the placement agent. Placement agents are usually underwriting arms of universal banks or private investment firms. Private offerings are conducted on a best efforts, rather than on a firm commitment basis. The investors receive restricted securities, which cannot be sold for at least a year.[4]

Another form of private debt available to firms is 144A debt. The SEC introduced Rule 144A in 1990 to promote greater foreign participation in the U.S. debt market (Chaplinsky and Ramchand (2004)). In contrast to traditional private placements, 144A placements can be freely traded among qualified institutional buyers (QIBs) without any holding period.[5] The SEC lifted resale restrictions with the belief that QIBs are able to independently obtain and process information about 144A securities. Another unique characteristic of the 144A market is that 144A debt can be registered after 60 days from the issuance to be publicly traded among individual investors. As indicated by Fenn (2000), this rule unexpectedly encouraged U.S. high-yield issuers to participate in the private debt market. Since 144A placements can be subsequently registered, firms that issue this kind of debt can combine the rapid issuance of private debt with the eventual liquidity of public debt. The ability to issue debt quickly through the Rule 144A market has eased issuance procedures for junk-rated firms. Most speculative-rated firms do not meet the SEC requirements for shelf registration. The 144A rule provides similar benefits to the shelf registration 415 rule without its strict requirements. High-yield

[4] The holding period was two years until February 1997.

[5] The following institutions qualify as QIBs. Institutions such as insurance firms or pension plans that own or invest at least $100 million in securities of nonaffiliates; banks or savings and loan (S&L) associations that have audited net worth of at least $25 million; brokers or dealers registered under the Exchange Act, acting for their own account or for that of QIBs that own and invest at least $10 million in securities of nonaffiliates; and entities whose equity holders are all QIBs.

issuers make use of the 144A rule to avoid lengthy registration requirements and subsequently register the issue making it similar to a public security.

2.2 Debt choice determinants and empirical questions

Firms that issue public debt face significant fixed costs which consist of registration, legal, trustee's and accountants' fees. Thus, small debt offerings are less likely to be public than large offerings. Small firms, which issue smaller quantity of debt, are less likely to issue public debt than large firms (Blackwell and Kidwell (1988), and Carey et al. (1993)).

Information asymmetry also affects a firm's debt choice. Creditors who cannot fully monitor the firm's activities require a higher yield to compensate for the risk associated with the moral hazard of asset substitution (Leland and Pyle (1977)). Firms with lower information asymmetry are less likely to substitute at bondholders' expense, and thus benefit from a lower cost of debt. Firms with higher information asymmetry can partially reduce the cost of debt by issuing debt privately (Krishnaswami et al. (1999)).

Problems associated with adverse selection are relevant for firms with high growth opportunities since these firms can more easily substitute low–risk projects with riskier ones (Myers (1977)). The monitoring provided by lending financial institutions reduces these problems. Firms that have proprietary, firm-specific information (usually positive private information on future cash flows) are characterized by higher information asymmetry and prefer to issue private debt so as to minimize the cost associated with adverse selection (Yosha (1995), and Hadlock and James (2002)). Firms with more growth options in their investment opportunity set are more likely to issue private debt (Krishnaswami et al. (1999)).

There is evidence that the firm's life cycle and credit quality also affect the corporate debt choice. The close monitoring and the covenants associated with bank debt and non-bank traditional private debt reduce the cost of debt for small firms that are early in their life cycle and have not had the opportunity to build a reputation about their credit quality yet (Berger and Udell (1998)). Firms in the early stages of their life cycle create credit reputation through bank loans; this reputation is later used to access the public debt market (Diamond (1991)). Indeed firm's age is positively related to the probability of issuing public instead of private debt (Johnson (1997)). Firms with high credit quality prefer public debt, firms with average credit quality tend to borrow from banks, and firms with poor credit quality rely mostly on non-bank private debt (Denis and Mihov (2003)).[6]

While controlling for all these factors, this study mainly focuses on two empirical questions. The first empirical question is related to the introduction of 144A debt in 1990 and the role that 144A debt has played among different corporate debt choices for US firms after its introduction. Firms issue 144A debt without contractual obligations such as covenants or collateral. Moreover, contrary to traditional private debt placements, 144A debt is usually subordinated and monitoring by investors is practically non-existent. The main benefits of 144A debt are speed of issuance due to the absence of an initial registration requirement, and high liquidity due to the possibility to essentially convert the issue into a public bond at a later date Fenn (2000)). Before the introduction of 144A issues in 1990, in many cases traditional private debt securities were sold to a limited group of institutional investors, usually insurance

[6] Event studies and long-term performance studies following debt placements provide complementary evidence to debt choice studies. Dichev and Piotroski (1999) report non-significant long-term returns following public straight debt issues but positive long-term returns following private debt issues. Chandra and Nayar (2008) further investigate this issue and find positive returns at the time of the announcement of private debt, but a negative long-term performance following issuance of private debt. Chang et al. (2007) show that low-quality firms can improve debt announcement returns by issuing secured debt.

companies, with an agreement to register the securities promptly (Johnson (1991)). Since 144A securities work essentially in the same way, they might have replaced traditional private placements of high-risk debt after the credit crunch in the traditional private debt market for speculative-grade debt at the beginning of the 1990s.

According to this hypothesis, firms that preferentially issue 144A debt should be significantly different not only from bank borrowers but also from firms that privately place debt securities without using the 144A rule. Firms that issue 144A debt should be characterized by lower credit quality and higher information asymmetry than firms that issue traditional non-bank private debt.

The second empirical question concerns the quality of traditional private debt issuers in comparison to bank borrowers. Banks are able to reduce the risk of their lending arrangements through diversification (Diamond (1984)). Since banks entertain relationships with many borrowing firms, even when some borrowers default, banks regularly receive enough cash from the remaining borrowers to secure payment to lenders. In contrast, the accredited and sophisticated investors that participate in the traditional private debt market cannot freely trade the debt securities for at least one year from the purchasing date, and unlike banks they often lend personal funds to the borrowing firm. As a consequence, traditional private debt investors might be willing to commit their capital only to high credit quality firms with low risk of default.

The credit quality of bank borrowers and traditional private debt issuers might differ for additional reasons. Bank debt potentially mitigates costs of information asymmetry better than traditional private debt because banks tend to maintain long-term relationships with borrowing firms and accumulate soft information about these firms (Fama (1985), Diamond (1991)). In addition, banks are able to quickly renegotiate loans and therefore could have superior ability to

contain financial losses in case of borrowers' financial distress than non-bank traditional private lenders. Finally, most publicly-traded firms make large use of syndicated loans.[7] As each bank in the syndicate holds only a portion of the loan, the borrowing firm's credit risk is shared among the syndicate members. Consistent with this argument, Angbazo et al. (1998) find that leveraged syndicated loans have lower yield spreads than other leveraged borrowing arrangements. As a consequence, firms with lower credit quality might more easily borrow through syndicated loans than traditional non-bank private debt.

According to this hypothesis bank loans should not be the preferred private debt source for good credit quality firms. Smaller firms with good credit quality that prefer not to access the public market because of high flotation costs and information asymmetry should be more likely to use traditional private placements rather than bank loans. Section 4 and 5 present the univariate and multivariate tests of these hypotheses.

3. Sample and variables

3.1 Sample selection and formation

I collect issue characteristics from SDC Global Issues, stock information from CRSP, and accounting data from Compustat. Since the SDC coverage of bank loans is not complete before 1995, I only consider debt issues by non-financial U.S. firms from 1995 to 2003. The total number of debt issues by non-financial U.S. firms during this period is 33,663. Private issues represent 71% of the sample. Among private issues, bank loans represent the largest portion. Out of 24,022 private issues by U.S. firms between 1995 and 2003, 14,000 (58%) are bank loans.

I then eliminate short-term debt (debt with maturity less or equal to one year), issues by firms that are not covered by CRSP or Compustat, and issues of financial subsidiaries of

[7] The majority of loans in the sample of this study consists of syndicated loans.

manufacturing firms (e.g., GE Mortgage Services, and GMAC). After these screenings the sample consists of 17,499 issues and 3,532 unique firms.

Since firms often borrow from banks using multiple tranches the same day, I aggregate all tranches into a single issue by adding up the principals of the tranches as in Gomes and Phillips (2007). Moreover, since firms place debt securities with the same characteristics within a limited period (Denis and Mihov (2003)), I aggregate debt issues of the same type by firm by quarter. In related studies, Gomes and Phillips (2007) aggregate debt issues by type within each month, Denis and Mihov (2003) aggregate within each year, and Arena and Howe (2009) aggregate within each quarter. Aggregating by quarter reduces statistical dependency without significantly losing statistical power.[8]

The principal of the aggregated debt is the sum of the principals of the single debt issues, while the maturity and yield of the aggregated debt is the weighted average of maturities and yields of the single issues. After this sample selection procedure, the sample consists of 2,170 firms and a total of 9,478 debt issues. I present the distribution of debt issues after 3-month aggregation by year and type in Table 1. Private issues represent the majority of the debt issues in the sample (78.58%). Among private issues, bank loans contribute 56.71 percent of the sample, 144A private placements 14.60 percent, and traditional private placements 7.27 percent. The year with the smallest amount of debt issues is 2000. Aside from 1995, 144A placements are more numerous than traditional private placements.

To my knowledge, this sample is the largest to date among multivariate studies which aggregate debt. By way of comparison, Denis and Mihov (2003) analyze 1,560 issues during 1995 and 1996. The sample of this study has 2,017 issues for the years 1995 and 1996. Even after aggregating debt financings within one year as Denis and Mihov (2003), the sample

[8] The main results of this study do not change if debt is aggregated by year or by month.

consists of 1,817 issues for 1995-1996. Moreover, the sample of this study is not only larger in the cross-section but also across time, spanning over nine years, from 1995 to 2003.[9]

In addition to the main sample, in section 6 I also consider a longer time-series sample of traditional private debt issuers from 1981 to 2003 to investigate in a univariate setting the change in firm characteristics of traditional private debt issuers before and after the introduction of the 144A rule. This sample consists of a total of 6,080 firm-issues, 3,220 before 1990 and 2,860 after 1990.[10]

3.2 Variables

Appendix A describes the variables and their sources. I use firm size and issue size as proxies for flotation costs. I use both the firm's market capitalization (*Marketcap*) and the total assets (*Assets*) calculated at the end of the fiscal year preceding the issue as proxies for firm size. I calculate the size of the issue as the principal of the debt issue (*Principal*) obtained by adding the principals of the issues aggregated every quarter, as described in Section 3.1.

I calculate firm age (*Age*) as the number of years between the CRSP listing date and the issue date. I use age both to test Diamond's (1991) life cycle theory and to control for unobservable credit risk as in Johnson (1997). [11]

I use *Q* and capital expenditures (*Capexp_ta)* as proxies for growth opportunities. As in Smith and Watts (1992), I calculate *Q* as the ratio of the market value of equity minus the book

[9] The sample of this study is also about 12% larger than the Gomes and Phillips (2007) debt sample. The difference in size would be even larger if in this study debt were aggregated within one month as in Gomes and Phillips (2007) instead of three months. Eckbo et al. (2007) report descriptive statistics on a longitudinally larger sample.

[10] This sample starts in 1981 because SDC starts full coverage of U.S. traditional private placements in that year.

[11] For the t-tests and multivariate analysis I use the natural logarithm of firm size, issue size, and firm age.

value of equity plus the book value of assets to the book value of assets. I calculate *Capexp_ta* as capital expenditures (item 128 on Compustat) divided by assets.

As in Denis and Mihov (2003) I use credit rating as a proxy for credit quality. This study considers both the rating of the issuer and the rating of each issue since rating agencies not only rate issuers but also single debt obligations. Issuer credit ratings are opinions on a firm's capacity to meet its overall financial obligations. Issue credit ratings are instead opinions of the creditworthiness of a firm with respect to a specific financial obligation and take into account the terms and conditions of the obligation as well as the creditworthiness of guarantors, insurers, and the presence of other forms of credit enhancement.[12] I convert ratings into numbers using the numeric transformation of Klock et al. (2005) as reported in Appendix B. I create the issue rating variable by converting Moody's and S&P issue ratings reported on SDC – Global Issues into numbers and then averaging them. In the event that only one of the two rating agencies covers a specific issue, I use the corresponding number. To construct the issuer rating variable I follow a similar method with the only difference that I merge the S&P ratings provided by SDC and Compustat to augment the sample size. Overall I have 4,959 out of 9,478 issues with ratings (52.3%), and 7,634 out of 9,478 issues with issuer ratings (80.5%).

As in Faulkender and Petersen (2006), I create an indicator variable equal to one when neither S&P or Moody's rate the issuing firm (*Missing_rating*). This indicator controls for the firm's access to public debt. While the other variables in this study are possible determinants of the corporate choice among different types of debt (demand side), the *Missing_rating* variable serves as a proxy for the constraints on a firm's ability to issue public rather than private debt (supply side).

[12] Bank loans were not rated before 1995. As indicated by Yi and Mullineaux (2006), in 1995 rating agencies started rating syndicated loans.

As shown by Kaplan and Urwitz (1979) and Ziebart and Reiter (1992), accounting and financial information can predict about two-thirds of the variability of credit ratings. Private insider information that rating agencies receive from firms that solicit ratings are partly responsible for the unexplained one-third of credit rating variability (Fairchild et al. (2009)). Following previous studies on the explanatory power of credit ratings I consider variables that are related to credit ratings and that proxy for interest coverage, capital structure, profitability, size, debt subordination status, and stability.[13]

The interest coverage variable, *Int_cov*, is equal to operating income before depreciation divided by interest expense. I calculate *Leverage* as total debt divided by total assets. As a measure of profitability I calculate return on assets (*ROA*). I measure *ROA* as net income before extraordinary items divided by total assets. As an alternative proxy of profitability, I construct an indicator equal to one if the net income before extraordinary items is negative in the fiscal year prior to the issue, and zero otherwise (*Loss*). As a measure of the subordination status of debt, I create an indicator variable equal to one when the firm has subordinated debt outstanding, and zero otherwise *(Subord*). I use fixed assets (*Fixed_assets*) and idiosyncratic volatility (*Ivol*) as measures of stability. I calculate *Fixed_assets* as gross PPE divided by total assets. *Ivol* is the monthly percentage idiosyncratic volatility of the firm, calculated as the standard deviation of the residuals of the Fama and French (1993) model obtained by regressing daily returns from month -15 to month -3 before the issue, and multiplied by the square root of 22.[14] Idiosyncratic volatility is a measure of stability of cash flows since it is strictly related to the volatility of future expected cash flows. I use *Ivol* also as a proxy for information asymmetry about firm-

[13] Butera and Faff (2006) provide an overview on how banks use firm characteristics to estimate credit ratings.
[14] When I estimate *Ivol* using the market model my results do not significantly change.

specific information as in Krishnaswami et al. (1999). If investors and managers are equally informed about market-wide risk, then residual volatility captures information asymmetry.

Another measure of credit quality based on accounting ratios is Altman (1977) Z. I calculate Altman's Z as 1.2 (Working Capital/Total Assets) + 1.4 (Retained Earnings/Total Assets) + 3.3 (Earnings Before Interest and Taxes/Total Assets) + 0.6 (Market Value of Equity/Book Value of Long-Term Debt) + (Net Sales/Total Assets). I create an indicator variable equal to one when Altman's Z is smaller than 1.81 (*Altman*), that is when the firm is at risk of bankruptcy.

In addition to issue size, I consider two other issue characteristics: years to maturity and yield spread to maturity. I calculate years to maturity of the three-month aggregated debt as the duration weighted maturity of all the aggregated issues (*Years_m*). Yield spread to maturity (*Yield_m*) is the offer yield spread to maturity of the 3-month aggregated debt over the Treasury security of similar maturity.

4. Univariate analysis

4.1 Issuer and issue characteristics

Table 2 presents the means and medians of issue and firm characteristics for firms that issue public securities, bank loans, 144A securities, and traditional private debt securities. The mean (median) total assets of public issuers are $15,086 million ($6,434 million), while the mean (median) market capitalization is $15,925 million ($5,185 million). Consistent with previous studies on the corporate choice between private and public debt, the sample firms that issue public bonds are on average larger and older than firms that issue private debt. The mean (median) total assets of private issuers are $4,989 million ($1,063 million), while the mean

(median) market capitalization is $4,426 million ($731 million). Among private issuers, bank borrowers are the smallest (mean total assets of $ 4,038 million, and mean market capitalization of $ 3,944 million).

Public issues have an average size of $557 million, average maturity of 12.4 years, and average yield spread to maturity of 4.8 percent. Consistent with previous studies, private issues are smaller, have shorter maturity, and offer a greater yield. Private issues have an average size of $377 million, average maturity of 6.1 years, and average yield spread to maturity of 6.5 percent. The average credit rating of public debt issuers and issues corresponds to BBB+ (Baa1), while the average credit rating of private issuers and issues correspond to BB+ (Ba1) and BB (Ba2) respectively.

Among private issuers, firms that issue 144A debt have the largest leverage, the lowest *Q*, the lowest return on assets, are more likely to have posted a net loss the year preceding the issue, have the lowest interest coverage, are the most likely to have subordinated debt outstanding and Altman's Z below 1.81, and are those with the lowest issuer credit ratings. These results suggest that 144A issuers are on average lower-quality and higher-risk firms compared to other private issuers.

4.2 Differences between issuers of different debt claims

Table 3 presents a series of two sample tests between the different types of debt financing. Since the same firm can issue different types of debt at different times, this analysis is affected by dependency among different debt groups. To control for this dependency I calculate the p-values of the difference of the means by way of an unbalanced mixed model of variance with random firm and year effects.

Private issuers are significantly smaller, younger, have a larger proportion of debt in their capital structure, are significantly less profitable, are more likely to have posted a net loss the year before the placement, are more likely to have subordinated debt outstanding, are more likely to have an Altman's Z below 1.81, are characterized by larger information asymmetry, and have a significant lower issuer credit rating. These results are consistent with the view that private issuers are characterized by lower credit quality than public issuers. The two-sample tests of issue characteristics show that private issues are significantly smaller, have shorter maturity, and offer higher yields than public issues.

The growth opportunities measure, *Q* (market-to-book), is significantly larger for public issuers. Even though this result appears to be inconsistent with Yosha (1995), it might be driven by firms in financial distress. The market value of equity of firms in financial distress is usually close to their book value, and therefore their *Q* is close to one. This result is thus consistent with private issuers having lower quality than public issuers and corroborates the result presented in Table 2: 144A issuers, usually high-yield issuers, are the ones with the lowest *Q*. An alternative explanation for this result is related to the agency problem of free-cash flows (Jensen (1986)). High investment firms (firms with larger *Q*) are not as affected by free-cash flow problems and are less dependent on the disciplinary role of debt (Jensen (1986)). These firms will be in less need to subject themselves to the monitoring of banks or traditional private investors to reduce debt financing costs. Consistent with this argument, Chen and Zhao (2006) find that firms with higher market-to-book ratios (more growth opportunities) face significantly lower public debt costs (lower spreads), ceteris paribus.

The central column of Table 3 shows that 144A issues are significantly different from traditional non-bank private placements across many characteristics. Firms that issue 144A debt

are significantly younger, with more leverage, and a lower proportion of fixed assets. More importantly, 144A issuers have significantly lower credit quality and higher information asymmetry than firms that issue traditional non-bank private debt. Specifically, firms that issue 144A debt are significantly more likely to have posted a net loss the year prior to the placement, are significantly more likely to have subordinated debt outstanding, are more likely to have an Altman's Z below 1.81, are characterized by a significantly higher firm-specific risk (i.e., idiosyncratic volatility), and have a significant lower credit rating. Firms that issue 144A debt are also more likely to have a Moody's or S&P credit rating than traditional private debt issuers. This result suggests that while many firms issue traditional private debt because they do not have access to the public market, most 144A issuers intentionally choose 144A debt over public debt.

Overall, the significant differences in credit ratings and other proxies for credit quality, such as the presence of subordinated debt and the likelihood to have posted a negative income in the year preceding the issue, suggest the following pecking order of debt financing source by issuer quality: (1) public bond offerings, (2) traditional private offerings, (3) bank loans, and (4) 144A placements. Issuers of traditional private placements have better credit quality than other private issuers. Their credit quality, however, is not as good as that of public issuers. Firms that issue traditional private debt might choose not to issue debt publicly both because of credit quality and information asymmetry considerations and the barrier constituted by flotation costs. Traditional private issuers are indeed on average $8,554 million smaller than public issuers and place on average $475 million less than public issuers.

This pecking order is different from the one reported by Denis and Mihov (2003) who find that firms that issue non-bank private placements have lower credit quality than bank borrowers. Denis and Mihov (2003) group 144A debt and traditional private placement together. Since, as

shown in Table 1, 144A debt issues are more numerous than traditional private placements, it is possible that Denis and Mihov's result is driven by the low credit quality of 144A issuers. I investigate this possibility in section 6.

The results of Table 3 suggest that after the credit crunch in the private placement market (Carey et al. (1993)) and the introduction of 144A issues at the beginning of the 1990s, 144A debt replaced traditional private debt placements for low credit quality firms. The results of Table 3 also show that traditional private debt issuers have better credit quality than firms that make use of bank loans. As argued by Diamond (1984), banks reduce the risk of their lending arrangements through diversification. Alternatively, the accredited and sophisticated investors that participate in the traditional private debt market cannot trade the debt securities for at least one year from the purchasing date, and unlike banks they sometimes lend personal funds to the borrowing firm. Consistent with this difference between banks and traditional private debt lenders, the results presented in Table 3 show that traditional private debt investors are willing to commit their capital only to high credit quality firms with low risk of default.

4.3 Credit ratings

While issuer credit ratings depend on the firm's capacity to meet its overall financial obligations, issue credit ratings depend also on the terms and conditions and other forms of credit enhancement of that specific debt obligation. I analyze both types of ratings to provide descriptive information on what form of debt firms can issue to enhance creditor protection so as to benefit from a lower yield.

In order to compare issue ratings with issuer ratings, in this section I consider only the 4,662 debt issues for which I have information about both ratings. The average bond issuer has a

credit rating of 14.88 that corresponds to Moody's Baa1, while bond issues on average have a rating of 15.10 (Baa1). The average bank borrower has a rating of 11.38 that corresponds to Moody's Ba2. Bank loans have on average a rating of 11.51 (Ba2). The average 144A issuer has a rating of 10.83 that corresponds to Moody's Ba2, while 144A issues on average have a rating of 10.01 (Ba3). The average private placement issuer has a rating of 14.20 that corresponds to Moody's Baa2, while private placements on average have a rating of 14.55 (Baa1).

Table 4 presents the pair t-tests for issue and issuer ratings by type of debt financing. The ratings of public bonds and bank loans are significantly higher than the ratings of their issuers, while the ratings of 144A issues are significantly lower than the ratings of their issuers. Bank covenants and bank monitoring improve creditor protection and therefore increase the bank loan credit rating compared to the credit rating of the borrowing firm. Conversely, firms make use of the 144A market to rapidly issue speculative-grade bonds (Fenn (2000)). The result presented in Table 4 is a direct consequence of the contractual differences between 144A debt and other forms of corporate debt. As stated by Fenn (2000), in contrast to other types of private placements and public bonds, 144A debt securities lack specific contractual terms and conditions that firms usually put in place to decrease the probability of default and the cost of debt.

5. Multivariate analysis

5.1 Choice among different forms of debt financing

I analyze the firm characteristics that influence the firm's choice between different forms of debt by means of a two-stage multinomial logistic regression with year and firm random effects to control for the longitudinal nature of my sample. As shown by Kaplan and Urwitz (1979) and

Ziebart and Reiter (1992), credit ratings are related to several firm characteristics that are also important determinants of the corporate decision on the type of debt to be issued. Therefore regressing credit ratings along with other firm characteristics would generate multicollinearity and erroneously affect the significance of the regression coefficients. To avoid multicollinearity I implement a two-step procedure. In the first step I regress issuer credit ratings on variables that have been found to be related to ratings to calculate the residuals. The residual variable created this way is highly correlated with the issuer credit rating variable, but is orthogonal to the other explanatory variables. In the second step I estimate a random-effect multinomial logistic regression with four dependent outcomes (public, bank, traditional private, and 144A) and the residuals of the first regression and several firm and issue characteristics as independent variables. The orthogonality between the rating residual variable and the other independent variables assures a correct estimation of the coefficients in the multinomial logistic regression.[15]

In the second step I estimate the debt choice regression using firm and year random effects. Firm random effects allow to control for unobserved firm cross-sectional differences while year random effects allow to control for the longitudinal structure of the sample. The random effects estimation uses both within and between firm variation of firm characteristics but does not treat observations for a given firm as independent. Standard errors are adjusted to reflect the cross-correlation between observations due to common firm components. The random effect approach is also supported by the Hausman test which does not reject the null hypothesis that random effects are efficient and consistent.[16] To avoid dropping observations with missing ratings I apply a method often used to avoid losing observations with missing Compustat variables (e.g.,

[15] Altman's Z is another variable that is potentially correlated to other financial accounting variables used in the regression. However, the variance inflation factor (VIF) of Altman's Z is less than 2, revealing that there is no multicollinearity between Altman's Z and the other independent variables.

[16] The result of Hausman test suggests that the firm and year effects are uncorrelated with the independent variables, confirming that random effects is the appropriate approach.

Palia (2001) and Fama and French (2002)). This method consists of setting the missing ratings to zero and introducing an indicator variable (*Missing_rating*) that is set to unity for the missing observations. The variable *Missing_rating* also controls for the firm's access to public markets as in Faulkender and Petersen (2006).

Panel A of Table 5 presents the result of the OLS regression used to calculate the rating residuals. All firm characteristics but interest coverage are significantly related to issuer credit rating. As shown by the large value of the adjusted R-squared (0.70), variables related to firm size, age, profitability, and stability explain a great portion of the credit rating variability. This result is consistent with previous studies on the relation between accounting and financial measures and credit ratings (e.g., Kaplan and Urwitz (1979)).[17]

Panel B of Table 5 presents the results of the multinomial logistic regressions with random effects. Consistent with previous studies, firms that issue public debt are larger and issue a larger amount of debt than firms that issue private debt of any type. Public issuers are also characterized by lower information asymmetry. Consistent with Denis and Mihov (2003) public issuers have better credit ratings than private issuers even after controlling for other firm characteristics. Firms with larger *Q* are more likely to issue public debt. This result might be driven by firms in financial distress that preferentially issue 144A debt. Another possible reason for this result is that high investment firms (firms with larger *Q*) are less affected by the Jensen (1986) free cash flow agency problem and do not need to submit to the monitoring of banks and traditional private investors to contain debt financing costs.

Most firm characteristics related to credit quality that are significantly different between public issuers and 144A issuers or bank borrowers (i.e., probability of bankruptcy, net loss the

[17] The first-step of this analysis is an OLS regression instead of an ordinal logit because logit regressions do not provide residuals. It is important to notice that when an ordered logit is estimated instead of an OLS regression, the magnitude, sign, and significance of the coefficients are very similar to those presented in panel A of Table 6.

year before the issue, outstanding subordinated debt, and leverage) are not significantly different between public issuers and firms that place traditional private debt. The lack of access to the debt public market (measured by *Missing_rating*) is instead a significant determinant of the probability of issuing traditional private debt. These results support the view that firms that place traditional private debt securities are characterized by good credit quality and do not issue public debt mainly because of the constraints imposed by flotation costs and information asymmetry.

The difference between traditional private placements and 144A placements is evident in the column that presents the coefficients of the regression that has as dependent variable the log-odds ratio of the probability of issuing traditional private debt versus 144A debt. Firms that place traditional private debt securities to accredited and sophisticated investors are significantly larger but place significantly less debt. They have lower information asymmetry, are less likely to post a net loss the year before the placement, have a significantly lower probability of bankruptcy, have a larger percentage of fixed assets to total assets, smaller leverage, and are less likely to have subordinated debt outstanding. Even though the two groups do not significantly differ in the unexplained portion of credit rating, the significant coefficients suggest that these two types of placements are significantly different and better quality firms are more likely to issue traditional private placements.[18]

In unreported multinomial logit regressions I add three macroeconomic variables as suggested by Blackwell and Kidwell (1988) and Cantillo and Wright (2000): standard deviations

[18] As shown in Table 2, only 46% of the firms that issue traditional private placements are rated by either Moody's or S&P. The lack of significance of the difference in credit rating between private issuers and 144A issuers might be caused by the absence of credit ratings for many companies that issue traditional private placements. However, missing ratings do not decrease the sample size. I avoid dropping observations with missing ratings by setting the missing ratings to zero and introducing an indicator variable (*Missing_rating*) that is set to unity for the missing observations (a similar approach for missing data is used by Fama and French (2002) and Palia (2001)).

of the daily 10-year constant maturity treasury bond rate over the 20 days prior to the issue, aggregate intermediary earnings, and the risk-free rate. These variables are not significant while the other variables do not change in significance when compared to the reported results.[19]

Table 6 presents the change in the implied probability of issuing a particular form of debt when the value of each variable of the multinomial logistic regressions presented in Table 5 increases from the 25th to the 75th percentile (or from zero to one for indicator variables) while all the other variables retain their median values. Firm size, measured as logarithm of total assets, is the variable with the greatest economic significance. When firm size increases from the 25th to the 75th percentile, the probability of issuing public debt increases by 20.6 percent while the probability of issuing bank loans decreases by 34.3 percent. Proxies of financial distress, such as *Altman* and *Subord*, are characterized by large implied probabilities of opposite sign for public debt and 144A issues. The unexplained portion of credit ratings is large and positive for public bonds and large and negative for 144A issues. An increase of the credit rating residual variable equal to its interquartile range increases the probability of issuing public debt by 6.8 percent, while decreases the probability of issuing 144A debt by 5.6 percent. The probability of issuing bank loans or traditional private placements is only marginally influenced by credit rating residuals (-0.8% and -0.4%). These results are consistent with the pecking order among different debt claims: low-risk firms are more likely to issue public debt while high-risk firms are more likely to participate in the 144A market.

Another economically significant variable is idiosyncratic volatility (*Ivol*). An increase in idiosyncratic volatility equal to its interquartile range decreases the probability of issuing public debt by 12.0 percent, while it increases the probability of issuing bank loans by 7.0 percent and

[19] These regressions are available upon request from the author.

the probability of issuing 144A debt by 5.3 percent. Leverage (measured before the debt issue) has a large influence on the probability of borrowing from banks. An increase of leverage equal to its interquartile range, decreases the probability of issuing bank loans by 10.2 percent, while increases the probability of issuing 144A debt by 6.9 percent. Even though *Q* is statistically significant in three out of the six specifications presented in Panel B of Table 5, it has little economic significance.

Table 6 also shows how, aside from firm size and the absence of credit rating (*Missing_rating*), no issuer characteristic has economic significance on the probability to choose traditional private placements. The low values of these implied probability changes and the large and opposite values for public debt and 144A debt suggest that traditional private placements lie in between public debt and other sources of private debt. This result is consistent with the evidence presented in previous tables.

6. Additional tests and robustness check

6.1. Are the Denis and Mihov (2003) results on non-bank private debt driven by 144A issues?

The results presented in Section 5 show that traditional private debt issuers differ significantly from 144A debt issuers. Denis and Mihov (2003) merge traditional private debt issuers and 144A debt issuers together and show that these firms have lower credit quality than bank borrowers. In order to verify that firms that issue 144A debt drive their result, I repeat the regression presented in Panel B of Table 5 merging 144A and traditional private debt issuers into the same group. The results of these multinomial regressions are presented in Table 7. The sign and significance of the coefficients of the credit quality variables clearly show that the non-bank private issuers (144A and traditional private debt issuers together) have lower credit quality than

bank borrowers consistent with Denis and Mihov (2003). The results of Table 5 and Table 7, when interpreted jointly, show that 144A debt issuers are the main cause of the non-bank private issuers result in Denis and Mihov (2003) and provide evidence of the different role played by 144A debt in debt markets in comparison to traditional private debt.

6.2 Suggestive evidence on the evolution in the traditional private debt market at the beginning of the 1990s

As shown in section 5, firms that issue traditional private debt are characterized by better credit quality than 144A debt issuers. As observed in the introduction, the implementation of 144A debt in 1990 might have created a new outlet for low credit quality firms raising debt capital. In this section I provide suggestive evidence of this conjecture by comparing firm characteristics of traditional private placement issuers before and after 1990 in a univariate setting. Table 8 presents the results. With the exception of ROA, all the firm characteristics related to credit quality of traditional private debt issuers are significantly different before and after 1990. Firms that issued traditional private debt after 1990 have lower leverage, are less likely to have Altman's Z lower than 1.81, are less likely to have posted a loss in the previous year, and are less likely to have subordinated debt outstanding than firms that issued traditional private debt before 1990.

The results on credit ratings are a further confirmation of the change in the characteristics of traditional private debt issuers in the wake of the 144A debt introduction. After 1990 the average traditional private debt issuer has a credit rating of A- (15.98), compared to a credit rating between BBB and BBB+ (14.42) before 1990. Moreover, before 1990 the majority of rated private debt issuers are speculative grade (rated BB+ or lower) while after 1990 the majority of rated traditional private debt issuers are investment grade. The decrease in the

average numbers of issues per year after 1990 offers additional support to the view that the good credit quality of traditional private debt issuers in recent years might be due to the use of the 144A market by private debt issuers in junk status. Chandra and Nayar (2008) find that negative long-term stock performance following the issuance of traditional private debt. The results of this study are consistent with theirs. Their sample starts in 1981 and ends in 1999. More than half of the debt issues in their sample predate the introduction of 144A debt in 1990.

6.3 Multinomial debt choice regressions without rating residual regression step

As described in the previous section, Panel B of Table 5 presents the results of multinomial logit regressions that include a rating residual variable obtained by a first-step rating regression. Denis and Mihov (2003) do not use a two-step procedure, but rather control for credit quality by simply using a credit rating indicator variable equal to one for investment grade firms and zero otherwise. For sake of comparability, Table 9 presents the results of multinomial logit regressions in which the rating residual variable is substituted by the investment-grade rating dummy. The sign and significance of the coefficients are consistent with those presented in Table 5. The only exception is the *Rating_dummy* variable being positive and significant for traditional private debt versus 144A debt. This result is consistent with the sign and significance of the other credit quality variables both in Table 5 and Table 9.

7. Conclusions

The results of this study reexamine the conventional view of non-bank private placements as a source of funds for poor credit quality firms. Even though the conventional view might have

been valid for private debt issues until the beginning of the 1990s, I show that for the sample period considered in this study (1995-2003) the pecking order of debt choices conditional on credit quality is different from previous studies. I found that high credit quality firms generally prefer public bond offerings. In addition, good credit quality firms, which are not large enough to overcome the barrier constituted by flotation costs and information asymmetry, are more likely to raise capital through traditional private offerings. A large group of firms characterized by moderate credit quality make extensive use of bank loans, and poor credit quality, high-risk firms preferentially issue 144A debt.

Traditional private placements are issued on average by firms characterized by better credit quality than bank borrowers. The introduction of the 144A debt market in 1990 has created an outlet for speculative-grade issuers at practically the same time in which these firms saw their traditional investors (i.e., insurance companies) shy away due to the worsening of insurance companies' financial conditions. A possible explanation for the evidence presented in this study is that the credit crunch in the speculative-grade private placement market might have shifted the traditional private placement market towards better credit quality firms with limited access to the public debt market.

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Appendix A: Variable definitions and sources

This table lists and describes the variables ordered by source. All firm characteristics are measured for the fiscal year preceding the debt issue.

Variable	Definition	Source
Altman	Indicator variable equal to one when Altman's (1977) Z is smaller than 1.81. Altman's Z is calculated as 1.2 (Working Capital/Total Assets) + 1.4 (Retained Earnings/Total Assets) + 3.3 (Earnings Before Interest and Taxes/Total Assets) + 0.6 (Market Value of Equity/Book Value of Long-Term Debt) + (Net Sales/Total Assets)	Compustat
Assets	Total assets of the firm expressed in millions of dollars	Compustat
Capexp_ta	Capital expenditures divided by total assets	Compustat
Fixed_assets	Fraction of fixed assets calculated as gross PPE divided by total assets	Compustat
Int_cov	Interest coverage calculated as earnings before interest, taxes, amortization and depreciation divided by interest expense	Compustat
Leverage	Total debt divided by total assets before the dent issue	Compustat
Lnassets	Natural logarithm of *Assets*	Compustat
Loss	Indicator variable equal to one if the net income before extraordinary item is negative, and zero otherwise	Compustat
Q	Ratio of the market value of equity minus the book value of equity plus the book value of assets to the book value of assets	Compustat
Rating_dummy	Indicator variable equal to one when the firm is rated investment grade, and zero otherwise	Compustat
Rating_issuer	Numerical conversion (see Appendix B) of S&P and Moody's issuer credit ratings	Compustat
Rating_res	See Table 6 and Table 7 headers	Compustat
Missing_rating	Indicator variable equal to one when the firm is not rated by S&P or Moody's, and zero otherwise	Compustat and SDC
ROA	Net income before extraordinary items divided by total assets	Compustat
Subord	Indicator variable equal to one when the firm has subordinated debt, and zero otherwise	Compustat
Age	Number of years from the CRSP listing date to the offering date	CRSP

Appendix A - Continued

Variable	Definition	Source
Ivol	Monthly percent idiosyncratic volatility three months before the issue calculated as the standard deviation of the residuals of the Fama and French (1993) model obtained by regressing daily returns from month -15 to month -3 before the issue	CRSP
Marketcap	Market capitalization of the firm three months before the debt issue	CRSP
Years_m	Years to final maturity of the debt issue	SDC
Yield_m	Yield spread to maturity of the debt issue over the Treasury security of similar maturity	SDC
Principal	Size of the debt offering expressed in millions of dollars	SDC
Public	Indicator equal to 1 when the debt issue is a public bond	SDC
Bank	Indicator equal to 1 when the debt issue is a bank loan	SDC
144A	Indicator equal to 1 when the debt issue is a 144A debt placement	SDC
Traditional private	Indicator equal to 1 when the debt issue is a traditional private placement	SDC

Appendix B: Credit rating numerical conversions

This table presents the conversion numbers of Moody's and S&P ratings used in this study for both univariate and multivariate analyses.

Conversion Number	Moody's Ratings	S&P Ratings
22	Aaa	AAA
21	Aa1	AA+
20	Aa2	AA
19	Aa3	AA-
18	A1	A+
17	A2	A
16	A3	A-
15	Baa1	BBB+
14	Baa2	BBB
13	Baa3	BBB-
12	Ba1	BB+
11	Ba2	BB
10	Ba3	BB-
9	B1	B+
8	B2	B
7	B3	B-
6	Caa1	CCC+
5	Caa2	CCC
4	Caa3	CCC-
3	Ca	CC
2	C	C
1	D	D

Table 1
Sample Debt Issues after 3-Month Aggregation

Year	All Issues	Public	Private	Private Issues		
				Bank Loans	144A	Traditional Private
1995	956	262	694	506	53	135
1996	1061	273	788	594	107	87
1997	1370	264	1106	824	199	83
1998	1341	299	1042	689	258	95
1999	999	212	787	536	167	84
2000	818	142	676	563	63	50
2001	979	205	774	513	202	59
2002	932	201	731	559	130	42
2003	1022	172	850	591	205	54
Total	9478	2030	7448	5375	1384	689
Percentage		21.42%	78.58%	56.71%	14.60%	7.27%

This table reports long-term debt issues from 1995 to 2003 for U.S. non-financial firms covered by both CRSP and Compustat. I aggregate offerings of the same type every three months. “Traditional Private” consists of traditional private placements to accredited and sophisticated investors.

Table 2
Descriptive Statistics – Firm and Issue Characteristics

	Public Bonds	Private Offerings	Bank Loans	144A Issues	Traditional Private
Assets	15086.46	4989.20	4037.74	7926.07	6532.72
	(6434.07)	(1062.64)	(910.82)	(1596.90)	(1137.51)
Marketcap	15925.85	4426.27	3944.47	5430.82	6187.36
	(5185.05)	(730.52)	(683.70)	(872.48)	(925.56)
Age	24.98	15.79	15.50	15.51	18.58
	(29.62)	(10.88)	(10.46)	(9.98)	(16.30)
Leverage	0.37	0.40	0.38	0.51	0.34
	(0.34)	(0.37)	(0.35)	(0.49)	(0.32)
Q	1.81	1.63	1.66	1.52	1.64
	(1.49)	(1.37)	(1.38)	(1.28)	(1.41)
ROA	0.04	0.02	0.02	0.00	0.04
	(0.04)	(0.03)	(0.03)	(0.01)	(0.04)
Loss	0.12	0.26	0.25	0.36	0.12
	(0)	(0)	(0)	(0)	(0)
Fixed_assets	0.71	0.58	0.58	0.57	0.63
	(0.67)	(0.52)	(0.51)	(0.52)	(0.58)
Capexp_ta	0.08	0.08	0.07	0.09	0.08
	(0.06)	(0.05)	(0.05)	(0.05)	(0.06)
Int_cov	8.56	12.50	14.67	4.48	11.86
	(6.05)	(4.66)	(5.01)	(2.99)	(6.27)
Subord	0.20	0.30	0.27	0.49	0.18
	(0)	(0)	(0)	(0)	(0)
Altman	0.14	0.19	0.16	0.24	0.14
	(0)	(0)	(0)	(0)	(0)
Ivol	9.41	13.88	14.02	14.41	11.78
	(8.69)	(12.43)	(12.57)	(13.30)	(10.33)
Rating_issuer	15.04	11.79	11.92	10.90	13.95
	(15)	(11)	(11)	(10)	(14)
Rating_issue	15.05	10.88	11.46	9.95	14.51
	(15)	(10)	(11)	(8.5)	(14)
Missing_rating	0.03	0.34	0.37	0.09	0.54
	(0)	(0)	(0)	(0)	(1)
Principal	557.38	376.88	428.50	322.83	82.71
	(300)	(200)	(218.8)	(200)	(55)
Years_m	12.38	6.14	4.79	9.60	9.84
	(10.14)	(5.01)	(5.00)	(10.13)	(8.62)
Yield_m	4.78	6.54	7.56	6.78	4.99
	(4.66)	(6.27)	(7.09)	(6.78)	(4.91)

This table presents the means (medians) of firm and issue characteristics of firms that issue public debt (public bonds), private debt (private offerings), and different types of private debt (bank loans, 144A issues, and traditional private issues). The sample is formed by 9,478 firm-issues from 1995 to 2003. Appendix A contains definitions of all variables.

Table 3
Differences in Firm and Issue Characteristics between Different Debt Offerings

	All Private vs. Public	144A vs. Bank Loan	144A vs. Traditional Private	Bank Loan vs. Traditional Private	Traditional Private vs. Public
Total_assets	**-10097.26**	**3888.33**	1393.35	**-2494.98**	**-8553.74**
	(0.001)	(0.003)	(0.389)	(0.010)	(0.004)
Marketcap	**-11499.58**	**1486.32**	-756.57	**-2242.89**	**-9738.50**
	(0.000)	(0.038)	(0.642)	(0.012)	(0.002)
Age	**-9.187**	0.011	**-3.068**	**-3.078**	**-6.396**
	(0.005)	(0.983)	(0.009)	(0.008)	(0.024)
Leverage	**0.032**	**0.132**	**0.170**	0.038	**-0.026**
	(0.048)	(0.087)	(0.089)	(0.134)	(0.056)
Q	**-0.180**	-0.137	-0.118	0.019	-0.172
	(0.089)	(0.156)	(0.116)	(0.785)	(0.103)
ROA	**-0.026**	**-0.021**	**-0.040**	**-0.019**	-0.004
	(0.033)	(0.057)	(0.024)	(0.066)	(0.413)
Loss	**0.138**	**0.109**	**0.232**	**0.123**	0.007
	(0.021)	(0.034)	(0.013)	(0.041)	(0.778)
Fixed_assets	**-0.127**	-0.007	**-0.060**	**-0.053**	**-0.078**
	(0.008)	(0.753)	(0.051)	(0.079)	(0.012)
Capexp_ta	**-0.006**	**0.011**	0.004	-0.008	-0.001
	(0.079)	(0.062)	(0.555)	(0.245)	(0.906)
Int_cov	**3.950**	**-10.194**	-7.384	**2.810**	3.309
	(0.037)	(0.064)	(0.234)	(0.070)	(0.189)
Subord	**0.106**	**0.224**	**0.310**	**0.086**	-0.013
	(0.009)	(0.014)	(0.024)	(0.049)	(0.688)
Altman	**0.05**	**0.08**	**0.10**	0.02	-0.01
	(0.097)	(0.078)	(0.065)	(0.843)	(0.198)
Ivol	**4.472**	**0.394**	**2.627**	**2.233**	**2.377**
	(0.003)	(0.059)	(0.012)	(0.011)	(0.009)
Rating_issuer	**-3.248**	**-1.017**	**-3.044**	**-2.027**	**-1.092**
	(0.000)	(0.005)	(0.003)	(0.004)	(0.035)
Rating_issue	**-4.165**	**-1.507**	**-2.457**	**-3.057**	-0.534
	(0.000)	(0.004)	(0.002)	(0.001)	(0.148)
Missing_rating	**0.31**	**-0.28**	**-0.45**	**-0.17**	**0.51**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Principal	**-180.50**	**-105.67**	**240.12**	**345.79**	**-474.67**
	(0.008)	(0.023)	(0.000)	(0.000)	(0.000)
Years_m	**-6.244**	**4.807**	-0.241	**-5.048**	**-2.541**
	(0.000)	(0.012)	(0.568)	(0.005)	(0.023)
Yield_m	**1.761**	**-0.784**	**1.790**	**2.256**	**0.214**
	(0.000)	(0.049)	(0.008)	(0.008)	(0.078)

This table presents the difference of the means of firm and issue characteristics for firms that issue public debt (private bonds), private debt (private offerings), and different types of private debt (bank loans, 144A issues, and traditional private issues). The sample is formed by 9,478 firm-issues from 1995 to 2003. The p-values are obtained with an unbalanced mixed model of variance with random firm and year effects to control for dependency among different debt groups. Appendix A contains definitions of all variables. P-values are reported in parenthesis. Significance at a minimum of 10% is reported in bold.

Table 4
Difference between issue and issuer ratings – Univariate analysis

Security	Mean	St Dev	t-stat	p-value	N
Public	**0.22**	1.98	4.73	<0.001	1836
Loan	**0.16**	1.33	4.50	<0.001	1429
144A	**-0.95**	2.30	-12.95	<0.001	1313
Traditional Private	0.24	1.73	1.26	0.212	84

This table presents pair t-tests between issue and issuer ratings by issue type (public bonds, bank loans, 144A debt placements, and traditional private placements). I obtain the numerical rating by using the conversion scheme presented in Appendix B and averaging Moody's and S&P ratings for companies covered by both rating agencies. Significance at a minimum of 10% is reported in bold.

Table 5
Two-Step Multinomial Logistic Regressions of Sources of Debt

Panel A: OLS regression to calculate rating residuals (Rating_res)

	Coefficient	p-value
Intercept	0.038	0.919
Lnassets	**0.276**	0.000
Lnmarketcap	**0.690**	0.000
Lnage	**0.289**	0.000
Leverage	**-1.252**	0.000
ROA	**1.626**	0.000
Q	**0.380**	0.000
Loss	**-0.556**	0.000
Int_cov	0.001	0.212
Subord	**-0.626**	0.000
Fixed_assets	**0.288**	0.000
Capexp_ta	**-0.891**	0.014
Ivol	**-0.126**	0.000
Altman	**-0.710**	0.000
Adjusted R^2	0.701	

Panel B: Multinomial Logistic Regression

	pub_vs_144a	loan_vs_144a	priv_vs_144a	pub_vs_loan	priv_vs_loan	pub_vs_priv
Intercept	**-2.007**	**4.542**	**-1.740**	**-6.536**	**-6.244**	-0.060
	(0.002)	(0.000)	(0.036)	(0.000)	(0.000)	(0.939)
Lnassets	**0.273**	**-0.478**	**0.421**	**0.896**	**0.748**	**0.166**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)
Principal	**0.001**	**0.001**	**-0.014**	**0.001**	**-0.015**	**0.015**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Q	**0.135**	0.062	-0.004	**0.074**	-0.065	**0.120**
	(0.017)	(0.198)	(0.961)	(0.074)	(0.276)	(0.063)
Altman	**-0.556**	**-0.329**	**-0.457**	**-0.224**	-0.128	-0.059
	(0.000)	(0.001)	(0.017)	(0.045)	(0.475)	(0.762)
Fixed_assets	**0.718**	**0.596**	**0.324**	0.125	**-0.269**	**0.409**
	(0.000)	(0.000)	(0.078)	(0.239)	(0.094)	(0.02)
Capexp_ta	0.248	**-2.358**	-0.898	**2.585**	**1.432**	1.199
	(0.646)	(0.000)	(0.214)	(0.000)	(0.033)	(0.118)
Int_cov	0.000	**0.010**	0.004	**-0.010**	**-0.007**	-0.004
	(0.998)	(0.026)	(0.471)	(0.002)	(0.009)	(0.388)
Ivol	**-0.119**	**-0.018**	**-0.050**	**-0.100**	**-0.032**	**-0.068**
	(0.000)	(0.005)	(0.000)	(0.000)	(0.005)	(0.000)
Leverage	**-0.573**	**-1.909**	**-0.908**	**1.335**	**1.001**	0.114
	(0.040)	(0.000)	(0.023)	(0.000)	(0.006)	(0.777)
Lnage	**0.145**	**0.069**	0.063	**0.076**	-0.009	0.078
	(0.003)	(0.071)	(0.335)	(0.056)	(0.879)	(0.229)
Loss	**-0.279**	-0.017	**-0.376**	**-0.253**	**-0.355**	0.033
	(0.039)	(0.867)	(0.055)	(0.033)	(0.048)	(0.869)
ROA	0.271	-0.713	-0.268	0.972	0.429	0.414
	(0.68)	(0.103)	(0.748)	(0.116)	(0.577)	(0.656)
Subord	**-0.692**	**-0.386**	**-0.485**	**-0.306**	-0.104	-0.168
	(0.000)	(0.000)	(0.002)	(0.001)	(0.475)	(0.291)
Rating_res	**0.255**	**0.102**	0.044	**0.153**	-0.057	**0.224**
	(0.000)	(0.000)	(0.298)	(0.000)	(0.148)	(0.000)
Missing_rating	-0.630	**1.810**	**3.208**	**-2.439**	**1.398**	**-3.836**
	(0.128)	(0.000)	(0.000)	(0.000)	(0.042)	(0.000)
Pseudo R^2	0.38					

Panel A presents the results of an OLS regression in which the dependent variable is *Rating_issuer*, the numerical credit rating obtained by using the conversion scheme presented in Appendix B and averaging issuer ratings offered by Moody's and S&P. Panel B presents the results of six multinomial logistic regressions with firm and year random effects in which the dependent variables are the log-odds ratio of the probability of issuing (1) public bonds versus 144A issues, (2) bank loans versus 144A issues, (3) traditional private debt versus 144A issues, (4) public bonds versus bank loans, (5) traditional private debt versus banks loans, and (6) public bonds versus traditional private placements. *Rating_res* are the residuals of the OLS presented in Panel A. Appendix A contains definitions of all other variables. P-values are reported in parenthesis. Significance at a minimum of 10% is reported in bold.

Table 6
Economic Significance of the Multinomial Logit Coefficients

	Public	Loan	Traditional private	144A
Lnassets	20.60	-34.30	4.00	9.70
Principal	0.60	15.00	-10.70	-5.00
Q	1.00	0.00	-0.10	-0.90
Altman	-5.00	-0.50	-0.40	5.80
Fixed_assets	2.40	3.60	-0.20	-5.70
Capexp_ta	2.00	-3.80	0.10	1.70
Int_cov	-0.70	1.50	0.00	-0.70
Ivol	-12.00	7.00	-0.40	5.30
Leverage	3.10	-10.20	0.20	6.90
Lnage	2.30	0.30	-0.10	-2.50
Loss	-3.50	2.40	-0.60	1.80
ROA	0.60	-1.10	0.00	0.50
Subord	-5.60	-2.90	-0.30	8.80
Rating_res	6.80	-0.80	-0.40	-5.60
Missing_rating	-16.40	21.60	11.40	-16.60

This table presents changes in probability of issuing public bonds, bank loans, 144A issues, and traditional private debt implied by the multinomial logit presented in Panel B of Table 5. The change in probability is calculated by assuming that the value of each variable increases from the 25^{th} to the 75^{th} percentile (or from zero to one for indicator variables) while all the other variables retain their median values. *Rating_res* are the residuals of the OLS regression presented in Panel A of Table 5. Appendix A contains definitions of all other variables. P-values are reported in parenthesis.

Table 7

Multinomial Logistic Regressions of Sources of Debt when 144A Debt Issuers and Traditional Private Issuers are Considered Jointly

	public_vs_allpriv	loan_vs_allpriv	public_vs_loan
Intercept	**-4.364**	**1.276**	**-5.640**
	(0.000)	(0.000)	(0.000)
Lnassets	**0.278**	**-0.622**	**0.910**
	(0.000)	(0.000)	(0.000)
Principal	**0.007**	**0.004**	**0.001**
	(0.000)	(0.000)	(0.000)
Q	**0.185**	0.051	**0.135**
	(0.000)	(0.127)	(0.000)
Altman	**-0.434**	**-0.224**	**-0.211**
	(0.000)	(0.006)	(0.097)
Fixed_assets	**0.575**	**0.245**	**0.331**
	(0.000)	(0.003)	(0.001)
Capexp_ta	0.053	**-1.897**	**1.951**
	(0.906)	(0.000)	(0.000)
Int_cov	-0.001	**0.003**	**-0.004**
	(0.227)	(0.039)	(0.004)
Ivol	**-0.103**	**-0.023**	**-0.08**
	(0.000)	(0.004)	(0.000)
Leverage	**-0.718**	**-1.885**	**1.169**
	(0.001)	(0.000)	(0.000)
Lnage	**0.099**	**0.056**	**0.043**
	(0.006)	(0.082)	(0.061)
Loss	**-0.550**	-0.012	**-0.538**
	(0.000)	(0.881)	(0.000)
ROA	0.002	-0.853	0.855
	(0.994)	(0.143)	(0.137)
Subord	**-0.656**	**-0.371**	**-0.286**
	(0.000)	(0.000)	(0.000)
Rating_res	**0.280**	**0.085**	**0.195**
	(0.000)	(0.000)	(0.000)
Missing_rating	**-2.002**	**0.342**	**-2.344**
	(0.000)	(0.000)	(0.000)
Pseudo R^2	0.25		

This table presents the results of three multinomial logistic regressions with firm and year random effects in which the dependent variables are the log-odds ratio of the probability of issuing (1) public bonds versus non-bank private debt issues, (2) bank loans versus non-bank private debt issues, and (3) public bonds versus bank loans. *Rating_res* are the residuals of the OLS presented in Panel A of Table 5. Appendix A contains definitions of all other variables. P-values are reported in parenthesis. Significance at a minimum of 10% is reported in bold.

Table 8
Characteristics of traditional private issuers before and after 1990

	1981-1989	1991-2003	t-stat	p-value
Lnassets	7.37	8.00	11.99	0.000
Q	1.26	1.50	9.97	0.000
Altman	0.67	0.62	-4.18	0.000
Fixed_assets	0.75	0.66	-8.49	0.000
Int_cov	6.33	9.37	3.78	0.000
Leverage	0.39	0.37	-2.88	0.004
Loss	0.16	0.12	-4.35	0.000
ROA	0.03	0.03	-0.05	0.958
Subord	0.33	0.23	-8.18	0.000
Rating	14.42	15.98	6.60	0.000
			chi-square	p-value
% speculative-grade issuers	61.16%	43.36%	211.55	0.000
Average n. issues per year	428	287		

This table presents two samples t-tests and a chi-square test for firm characteristics related to credit quality of firms which issued traditional private debt before and after 1990. Appendix A contains definitions of all the variables.

Table 9

Multinomial Logistic Regressions of Sources of Debt with Investment-Grade Rating Indicator Variable

	pub_vs_144a	loan_vs_144a	priv_vs_144a	pub_vs_loan	priv_vs_loan	pub_vs_priv
Intercept	**-2.750**	**2.477**	**-0.344**	**-4.875**	**-2.313**	**-2.578**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Lnassets	**0.223**	**-0.552**	**0.478**	**0.752**	**0.548**	**0.208**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Principal	**0.001**	**0.001**	**-0.013**	**0.001**	**-0.016**	**0.016**
	(0.000)	(0.098)	(0.000)	(0.000)	(0.000)	(0000)
Q	**0.094**	0.006	-0.072	**0.096**	0.002	**0.095**
	(0.048)	(0.886)	(0.279)	(0.006)	(0.971)	(0.046)
Altman	**-0.325**	**-0.220**	**-0.413**	**-0.142**	0.082	-0.028
	(0.006)	(0.012)	(0.023)	(0.085)	(0.336)	(0.648)
Fixed_assets	**0.516**	**0.312**	**0.444**	0.184	**-0.325**	**0.511**
	(0.000)	(0.001)	(0.004)	(0.153)	(0.000)	(0.000)
Capexp_ta	-0.060	**-2.211**	-1.533	**2.281**	**2.248**	0.007
	(0.897)	(0.000)	(0.115)	(0.000)	(0.000)	(0.987)
Int_cov	0.000	**0.006**	0.003	**-0.006**	**-0.006**	0.000
	(0.932)	(0.035)	(0.451)	(0.021)	(0.047)	(0.968)
Ivol	**-0.113**	**-0.019**	**-0.041**	**-0.122**	**-0.037**	**-0.071**
	(0.000)	(0.004)	(0.001)	(0.000)	(0.005)	(0.000)
Leverage	**-0.242**	**-1.705**	**-0.234**	**1.507**	**1.658**	-0.147
	(0.087)	(0.000)	(0.088)	(0.000)	(0.000)	(0.538)
Lnage	**0.135**	**0.061**	0.063	**0.067**	-0.004	0.072
	(0.004)	(0.077)	(0.335)	(0.059)	(0.911)	(0.256)
Loss	**-0.314**	-0.026	**-0.396**	**-0.261**	**-0.214**	-0.091
	(0.005)	(0.756)	(0.000)	(0.012)	(0.082)	(0.210)
ROA	-0.053	-0.990	-0.289	0.765	0.808	-0.049
	(0.847)	(0.102)	(0.463)	(0.137)	(0.212)	(0.856)
Subord	**-0.419**	**-0.314**	**-0.538**	**-0.197**	0.123	-0.221
	(0.000)	(0.000)	(0.000)	(0.053)	(0.342)	(0.208)
Rating_dummy	**1.910**	**0.755**	**0.909**	**1.182**	-0.141	**1.913**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.189)	(0.000)
Missing_rating	-0.259	**1.569**	**3.080**	**-1.937**	**1.635**	**-3.512**
	(0.254)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Pseudo R^2	0.29					

This table presents the results of six multinomial logistic regressions with firm and year random effects in which the dependent variables are the log-odds ratio of the probability of issuing (1) public bonds versus 144A issues, (2) bank loans versus 144A issues, (3) traditional private debt versus 144A issues, (4) public bonds versus bank loans, (5) traditional private debt versus banks loans, and (6) public bonds versus traditional private placements. Appendix A contains definitions of all other variables. P-values are reported in parenthesis. Significance at a minimum of 10% is reported in bold.