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Galina Hale
Federal Reserve Bank of San Francisco

João A. C. Santos
Federal Reserve Bank of New York

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Galina Hale*
Research Department
Federal Reserve Bank of San Francisco
101 Market St. Ms 1130
San Francisco, CA 94105
E-mail: galina.b.hale@sf.frb.org

João A. C. Santos*
Research Department
Federal Reserve Bank of New York
33 Liberty St.
New York, NY 10045
E-mail: joao.santos@ny.frb.org

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Abstract

This paper investigates whether it is costly for non–financial firms to enter the public bond market, and whether firms benefit from their bond IPOs. We find that both gross spreads and ex-ante credit spreads are higher for IPO bonds, suggesting that firms pay higher underwriting costs on their first public bond. We also find that underpricing in the secondary market is higher for IPO bonds, further suggesting that it is costly to enter the public bond market. The costs of entering the public bond market are economically meaningful and are higher for risky firms. We investigate the benefits from entering the public bond market, by looking at the costs firms pay to raise external funding subsequently to their bond IPOs. Our results show that these benefits exist, but they accrue only to safe firms. These firms benefit from a reduction both in the interest rates they pay on bank loans and the costs they incur to issue private bonds after they enter the public bond market. Together with our the previous findings, these results lend support to the thesis that bond IPOs are unique.

1 Introduction

Researchers have devoted a great deal of attention to equity IPOs, but paid only limited attention to firms' IPOs of bonds. Yet, the bond market is a more important source of external funding for firms than the equity market, and some of the reasons that explain the uniqueness of equity IPOs are also likely to make a firm's first issue of public bonds unique. This paper attempts to close this gap in the literature by investigating whether it is costly for non–financial firms to access the public bond market for the first time, and by investigating potential benefits of this decision. Our results show that it is indeed costly to enter the public bond market. Firms pay higher underwriting costs on their IPO bonds, and these bonds are subject to more underpricing in the bond market. However, we find evidence that it is beneficial for firms to enter the public bond market as this leads to a reduction in their cost of external funding.

It is well established in the finance literature that it is costly to float equity. The main source of this cost is underpricing, but the direct compensation firms pay underwriters for taking them public also contributes to it. The closing market price on the first day of trading of an equity IPO is usually higher than the offer price. According to Ritter's (2003) survey of the literature on equity IPOs in 38 countries, the average initial return ranges from 5% in Denmark to 257% in China. As for the direct compensation firms pay underwriters, which is usually in the form of an underwriting discount or gross spread, according to Fernando, Gatchev, and Spindt (2004) there is a decline in the gross spread from firms' equity IPOs to their subsequent equity issues.

Researchers have suggested several rationales for the underpricing of equity IPOs. Benveniste and Spindt (1989), for example, shows that when there are both informed and uninformed investors, equity underpricing may be part of the optimal arrangement to induce informed investors to reveal their valuations.[1] Welch (1992) shows that underpricing may be useful to induce the first few potential investors to buy, and, through these purchases, create a cascade in which all subsequent investors want to buy irrespective of their own information. Allen and Faulhaber (1989), Grinblatt and Huang (1989) and Welch (1989), in turn, show that when issuing firms have private information about their value, underpricing may be a useful signaling device. Lastly, Hughes and Thakor (1992) show that equity underpricing may be an efficient method to reduce the cost of future class action lawsuits since only investors who lose money are entitled to damages, and Chemmanur (1993), Aggarwal, Krigman and Womack (2002), and Demmers and Lewellen (2003) explain underpricing as a marketing tool: Firms underprice because they benefit from the publicity that comes with a high first–day return.

[1] Rock (1986) also provides an explanation for underpricing that builds on the presence of both uninformed and informed investors but he focuses on the winner's curse problem that arises in fixed price offerings.

Bonds are different from equities, and the pricing and distribution methods of bonds are different from those used for equities. While the payoffs on equities are very sensitive to firm–specific information, and have substantial upside potential as well as downside risk, the relative yields on corporate bonds of a given maturity are greatly influenced by credit risk which is usually assessed by independent rating agencies. Despite these differences, it is apparent that some of the reasons researchers have put forward to explain the underpricing of equity IPOs are also likely to lead to the underpricing of bonds' IPOs, suggesting that may be costly to enter the public bond market. Entering this market may also be costly because of the compensation firms have to pay the underwriters of their IPO bonds. Firms have to pay underwriters both for the services they provide, including the production of information and the distribution services, and for the risk they carry in underwriting the firm's securities. The lack of a track record in the public bond market coupled with the absence of credit ratings and coverage of bond market analysts will make it more difficult for underwriters to perform their services and to pose a greater risk to them, suggesting further that it is costly for firms to first enter the public bond market.[2]

Given that bond financing is more important for firms than equity financing in terms of the dollar value of funds they raise, it is surprising that researchers have devoted a great deal of attention to the costs of entering the equity market and paid only limited attention to the costs of entering the public bond market. There is a vast literature on the price/yield determinants of new corporate bonds, but most of these studies do not attempt to investigate the pricing of bond IPOs. For example, studies of the credit spreads of new bonds, including Blackwell and Kidwell (1988), Collin-Dufresne, Goldstein and Martin (2001), and Elton, Gruber, Agrawal and Mann (2001), do not distinguish IPO bonds from bonds of seasoned issuers. The same is true of studies, including Ederington (1974), Lindvall (1977), Weinstein (1978), Sorensen (1982), Fung and Rudd (1986), Sorensen (1982), and Wasserfallen and Wydler (1988), that attempt to explain why new bonds carry higher yields than similar seasoned bonds, that is, bonds that have been outstanding for some time. Datta, Iskandar-Datta and Patel (1999) consider a sample of bond IPOs, but they only investigate if the existence of bank debt lowers the ex ante credit spreads on these bonds.

Only recently, researchers started to investigate the pricing of IPO bonds. Consistent with the idea that it is costly to first enter the public bond market, Cai, Helwege and Warga (2005) find that IPO bonds are subject to more underpricing than bonds of seasoned issuers while investigating the initial trading day return on these bonds (which is not necessarily the

[2]Firms usually do not get a rating from a major credit rating agency or coverage from bond analysts until they start issuing in the public bond market.

day after the issue date since not all bonds trade every day).[3] Cai, Helwege and Warga (2005), however, focus on underpricing in the bond market and do not investigate the underwriting costs firms incur to get the services of investment banks. These costs appear to exist: Gande, Puri, Saunders, and Walter (1997) and Gande, Puri and Saunders (1999) find that IPO bonds carry higher gross spreads and ex-ante credit spreads than bonds of seasoned issuers in their investigation of the competitive implications of US commercial banks' reentry the investment banking business in the 1990s. Fenn (2000) also finds that IPO bonds carry higher ex-ante credit spreads than bonds of seasoned issuers while investigating the pricing of Rule 144A speculative grade bonds in the primary market. However, these papers unveil these results based on pooled regressions, making it unclear whether the pricing differences they detect for IPO bonds are firm specific or driven by differences in unobserved firm characteristics. In contrast to Cai et al., neither of these studies investigates the other source of the cost to enter the public bond market – underpricing.

Our paper is related to this literature in that we also investigate the costs to enter the public bond market for the first time, but it adds to it in several important ways.[4] First, we look at both the compensation that firms have to pay underwriters and the underpricing of their IPO bonds in the market. To this end, we investigate the gross spreads and ex-ante credit spreads of IPO bonds as well as the underpricing of these bonds by comparing their ex-ante yield spreads with their yield spreads when they first trade in the bond market. We think that it is important to look at these three measures because they all affect the cost of accessing the public bond market and are potentially interrelated. For instance, underwriters may try to offset the extra costs of bringing IPO bonds to the market by raising their yields (and lowering the prices paid to the issuers) in order to increase the probability that they will sell out these issues. Also, if investors demand a higher yield to buy IPO bonds than equivalent bonds of seasoned issuers, this will be reflected in the price that underwriters guarantee the issuers, adding to the cost of first accessing the public bond market.

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[3]Datta, Iskandar-Datta and Patel (1997) and Helwege and Kleiman (1998) also find that IPO bonds are subject to underpricing but they do not compare it to the initial day return on bonds of seasoned issuers.

[4]The way we identify IPO bonds does not perfectly match the identification criteria used in this literature. Gande et. al (1999) identify IPO bonds by selecting the first public bond each firm has in the SDC database. Cai, Helwege and Warga (2005), in turn, also consider Rule 144A bonds when identifying firms' IPO bonds. Our criteria to identify IPO bonds is closer to Gande et. al's (1999) criteria. However, given that SDC's database starts in 1970, to minimize the misclassification problem that will arise with firms that issued public bonds prior to 1970, we limit our sample to firms that first appeared in Compustat on or after 1969. We opted for not considering Rule 144a bonds as public bonds in part because this rule was introduced during our sample period (Rule 144A was adopted by SEC in April 1990), and also because these bonds while different from "pure" private bonds are still distinct from public issues because individual (retail) investors cannot participate directly in the market for these securities.

Second, in addition to an investigation of the cross section determinants of bond spreads, we also investigate if the differences in spreads for IPO bonds are firm specific. In other words, we investigate if firms pay a higher compensation to the underwriters of their IPOs than to the underwriters of their subsequent public bond issues, using only within firm variation in spreads for identification. Third, we control for the fundamentals of bond issuers in addition to the credit rating of their bonds while the existing studies rely exclusively on the credit rating of bonds to control for the risk of issuers.

Lastly, we complement the existing literature on the costs of IPO bonds with an investigation on the potential benefits of entering the public bond market. The equity IPO literature points to various benefits to firms from listing their stock including the increase in the liquidity of pre-IPO shareholders' portfolios (Ritter 2003); the access to a funding source that does not carry the liquidity premium demanded by investors in private firms (Chemmanur and Fulghieri 1999); and the opportunity it gives entrepreneurs of startups financed by venture capitalists to regain control following the venture capitalist's distribution of the firm's shares to its partners (Black and Gilson 1998).

With the exception of Diamond's (1991) reputational theory, the theoretical literature on public debt does not specifically address firms' decisions to enter the public bond market for the first time.[5] The advantages of public debt financing that this literature assumes, however, are likely to play a role in firms' decision to undertake their public debt IPO. Some of these advantages derive from the attributes of public debt financing, including its lower monitoring costs and renegotiation possibilities, as well as fewer restrictive covenants compared to bank loans, and from the bargaining power that comes with the firm's ability to raise funding in the public bond market. Other advantages yet derive from the information firms need to release to enter the public debt market, which is likely to reduce banks' informational advantage and consequently decrease their ability to extract rents from firms (Sharpe 1990 and Rajan 1992).[6]

The empirical literature on firms' use of public debt financing has also devoted little attention to firms' decisions to enter the public bond market for the first time. An important strand of this literature investigates firms' choices of bank and bond financing based on cross sections of firm data.[7] Existing studies of firms' marginal financing decisions, on the other hand,

[5]See Rajan (1992), Besanko and Kanatas (1993), Chemmanur and Fulghieri (1994), Yosha (1995), Bhattacharya and Chiesa (1995), Boot and Thakor (1997), Holmstrom and Tirole (1997), Repullo and Suarez (1998), Bolton and Freixas (2000) and Carey and Rosen (2001) for theories on public debt.

[6]The reduction in informational asymmetries arises because of the information firms have to produce for their SEC registration and the additional scrutiny of rating agencies and investors once the firms enter the public bond market. Moody's and S&P, for example, have the policy of rating public corporate bond issuers even when issuing firms do not apply for their ratings.

[7]See Blackwell and Kidwell (1988), Easterwood and Kadapakkam (1991), Carey et al. (1993), Houston and

do not take into account firms' bond issuance history and, consequently, do not investigate firms' decisions to enter the public bond market.[8] The same is true of studies of the impact of firms' use of public debt financing on the cost of bank funding.[9] A notable exception is Datta, Iskandar-Datta and Patel's (2000) investigation of the stock market response to firms' announcements of their bond IPOs. They find that bond IPO announcements convey a negative signal to the stock market. This result, they argue, is consistent with debt ownership theories premised on information superiority of banks over public debtholders (Campbell and Kracaw 1980, and Fama 1985) and the signaling theories of debt maturity choice (Flannery 1986, and Kale and Noe 1990), but inconsistent with the bank hold–up theory (Sharpe 1990 and Rajan 1992).

Like Datta et. al (2000), we are interested in the effects of firms' bond IPOs. We focus, however, on the effects that firms' bond IPOs may have on the cost of external funding, particularly on bank borrowing. The bargaining power that comes with firms' ability to raise funding in the public bond market together with the new information firms need to release to first access this market and the new scrutiny that comes with this access, is likely to reduce banks' ability to extract informational rents and consequently reduce the cost of bank funding. To investigate this hypothesis, we compare the spreads on bank loans that firms pay after they enter the public bond market with the spreads they used to pay beforehand, controlling for both loan covenants and firm characteristics.

The results of our investigation on the costs of issuing the first bond in the public bond market show that it is indeed costly to enter this market. We obtain these results controlling for firm fixed effects and time–varying firm fundamentals. Firms do pay higher gross spreads on their IPO bonds than on the public bonds they issue afterwards. Further, we do not find evidence that firms are compensated for these higher underwriting costs by obtaining from underwriters a more favorable guaranteed price on their IPO bonds. In fact, our investigation of ex ante credit spreads suggests otherwise, because we find that firms pay higher ex ante credit spreads on their IPO bonds than on the public bonds they issue afterwards. Our investigation of bond prices in the secondary market also shows that it is costly to enter the public bond market because IPO bonds are subject to more underpricing than non–IPO bonds. These results are robust to controlling for firm, bond and market characteristics that are known to

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James (1996), Johnson (1997), and Krishnaswami, Spindt and Subramaniam (1999).

[8]See Helwege and Liang (1996), Cantillo and Wright (2000), Denis and Mihov (2002), and Hadlock and James (2002).

[9]Booth (1992), for instance, investigates whether the presence of public debt in the balance sheet affects the interest rate the firm pays on its bank loans while Santos and Winton (2005) investigates whether prior issuance of public bonds affects the interest rate the firms pays of its bank loans.

affect underwriting costs and bond pricing. We find that the costs of entering the public bond market are present for all the firms, but are more pronounced for those firms that enter the market with a bond rated below investment grade. Firms that enter this market with a bond rated investment grade also pay a premium on the gross spreads on their IPO bonds, but these bonds are not subject to more underpricing in the bond market.

The results of our investigation into the benefits from bond IPOs show that firms that enter the public bond market with a bond rated investment grade benefit from a reduction in the spreads they pay on their loans afterwards. The difference in loan spreads is both statistically significant and economically meaningful, even when we control for firm fixed effects and time–varying firm fundamentals. In contrast, firms that enter the public bond market with a bond rated below investment grade do not benefit from these savings. This difference in the benefits from entering the public bond market is consistent with Rajan's (1992) hold–up theory. The information that firms reveal to issue their first public bond is likely to attract attention from banks and consequently more competition for the loans they take out afterwards. Given the winner's curse problem, the surge in competition is likely to affect predominantly safer firms, thereby explaining why these firms benefit from a reduction in their loan spreads but riskier firms do not benefit from a similar reduction.

The remainder of our paper is organized as follows. The next section presents our methodology, data, and characterizes our sample of bond IPO firms. Section 3 presents our findings on the cost of entering the public bond market, and section 4 shows how entering this market affects the cost of raising external funding. Section 5 concludes the paper.

2 Methodology, data, and sample characterization

2.1 Methodology

The methodology we adopt in this paper has two parts. The first part attempts to investigate the costs of entering the public bond market. In this part, we first investigate if underwriting costs are higher for IPO bonds. Specifically, we investigate if IPO bonds carry higher gross spreads and ex ante credit spreads than public bonds of seasoned issuers. We then proceed with our investigation of the costs of entering the public bond market by looking at another source of these costs: underpricing in the bond market. To this end, we compare the *ex–ante* yields on IPO bonds with the yields on these bonds when they first trade in the secondary market.

In the second part, we investigate if firms' entry to the public bond market is beneficial to them. Specifically, we investigate if firms are able to borrow in the private bond market and from banks at lower interest rates after they enter the public bond market. We describe next

the tests we use to investigate each of these issues.

Costs: Gross spreads

We start our analysis of the costs of entering the public bond market by investigating whether IPO bonds carry higher gross spreads. To this end, we estimate the following model

$$GROSS\ SPREAD_{ijt} = \alpha_i + \beta\ IPO_{ijt} + X'_{it-1}\,\psi + Y1'_{ijt}\,\nu + Y2'_{ijt}\,\mu + Z'_t\,\eta + \epsilon_{ijt}. \qquad (1)$$

where $GROSS\ SPREAD_{ijt}$ is the underwriting spread of bond j issued by firm i in year t, measured as the difference between the offered amount and the proceeds to the issuer, expressed as a percentage of the offered amount (issue size). This is a standard measure of the costs of bond issuance which is due to underwriters. IPO is a dummy variable that takes the value 1 for the IPO bonds. This is our main variable of interest as it tells us whether the gross spreads of IPO bonds are different from those observed in seasoned public issues. In some specifications, we further add the dummy variable $SECOND$, which takes the value 1 for the second public bond issued by our bond IPO firms, to investigate if underpricing persists beyond the IPO bond. We also investigate if underpricing varies with the credit rating of the IPO bond. To this end we add to our model a dummy variable $IGRADE$, which takes the value 1 for the investment–grade bonds, and the interaction of this variable with our IPO variable.

We investigate if IPO bonds pay higher gross spreads controlling for a set of firm–specific variables measured the year before the bond IPO, X, that are likely to determine the risks of the firm. These risks affect the underwriter's chances of success and consequently the cost the underwriter will charge the firm to bring its IPO bond to the market. A subset of these variables, which includes AGE, the firm's age in years, and $ASSETS$, the firm's real assets (in millions of 1980 dollars computed with the CPI deflator), attempts to control for the risk of the firm's overall risk. The next subset of variables attempts to control for the risk of the firm's *debt*. It includes the firm's ROA, the return on assets (net income divided by assets); $INTEREST\ COV$, the interest coverage, which is a more direct measure of the firm's ability to service debt ($EBITDA$ divided by interest expense); $LEVERAGE$, the leverage ratio (debt over total assets); and $EARNINGS\ VOL$, the earnings volatility (the standard deviation of the firm's quarterly return on assets over the last three years). The next subset of variables, which includes $TANGIBLES$, the firm's tangible assets (inventories plus plant, property, and equipment over total assets), and $ADVERTISING + R\&D$, the firm's expenses with advertising and R&D scaled by the firm's sales, in turn, control for the size and quality of the asset base that debt holders can draw on in default.[10] We also control for $INVESTMENTS$,

[10]Given that tangible assets lose less of their value in default than do intangible assets such as brand equity,

the firm's investments scaled by its assets, to proxy for the value the firm is expected to gain by future growth.[11] Lastly, we control for the firm's industry as defined by its 1-digit SIC code because each industry may face additional risks that are not captured by the list of control variables presented above.

Following Gande, Puri and Saunders (1999), we also consider in our model on gross spreads a set of bond features, *Y1*, including the size of the issue, $AMOUNT$, and the maturity of the issue, $MATURITY$, which are likely to affect underwriting costs. If economies of scale are prevalent in the underwriting business, we would expect larger issues to pay lower underwriting costs. In contrast, the additional risk of longer maturity bonds may lead banks to demand a higher compensation to underwrite these bonds.

In addition, we control for a set of bank–related variables, *Y2*. Following Yasuda's (2004) finding that firms which have lending relationships with their bond underwriters pay lower gross spreads, we include in our model $BK\ RELATIONSHIP$, which is dummy variable that takes the value 1 if the bond IPO underwriter also acquired the firm's last private placement or extended the firm its last loan prior to its IPO bond. Following the finding of Livingston and Miller (2000), Yasuda (2004), and others, that high reputation underwriters charge lower bond underwriting fees, we control for the reputation of the underwriter by adding to our model the variable $BK\ MKT\ SHARE$, which measure the market share of the underwriter.

Lastly, we control for a set of other variables, Z_t, which are unrelated to the firm or bond characteristics, but vary over time and are likely to affect the costs of underwriting. Following Gande, Puri and Saunders' (1999) finding that banks' entry to the bond underwriting business in the late 1980s lowered the costs of bond underwriting, we include in our model the dummy variable $AFTER$ 1988, which takes the value one for the bonds issued in the period post 1988.[12] We also include a dummy variable, $RECESSION$, which takes the value 1 if the bond was issued during a recession, as the additional difficulties of placing bonds during recessions may lead underwriters to demand a higher compensation from firms that issue during downturns, and a time trend, $TIME\ TREND$, to control for a possible secular decline in gross spreads.

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we expect the former variable to have a negative effect on spreads and the latter one to possibly have a positive effect on spreads.

[11] Although growth opportunities are vulnerable to financial distress, we already have controls for the tangibility of book value assets. Thus, this variable could have a negative effect on spreads if it represents additional value (over and above book value) that debt holders can in part access in the event of default.

[12] The restrictions in the Glass–Steagall Act which prohibited commercial banks from offering underwriting services began to erode in late 1988 with the Fed's permission for bank holding companies to offer bond underwriting services through a nonbank subsidiary provided the revenue of these services did not exceed 10% of the subsidiary's total revenue.

Given that controls that account for bond characteristics, Y_{ijt}, may be jointly determined with the bond's gross spreads, we estimate our model of gross spreads with and without these controls. Finally, because the gross spreads on IPO bonds may vary across firms, we estimate our models both with a pooled regression and with firm fixed effects, α_i.

Costs: Ex ante credit spreads

We proceed to investigate if IPO bonds have higher ex ante credit spreads. We investigate these spreads out of concerns that underwriters may choose to compensate for the extra costs of bringing an IPO bond to the market by increasing their yields, which will imply a reduction in the guaranteed price to the issuer. To this end we estimate the following model of ex ante credit spreads

$$CREDIT\ SPREAD_{ijt} = \alpha_i + \beta\, IPO_{ijt} + X'_{it-1}\,\psi + Y1'_{ijt}\,\nu + Y2'_{ijt}\,\mu + Z'_t\,\eta + \epsilon_{ijt}. \qquad (2)$$

where $CREDIT\ SPREAD_{ijt}$ is the percentage point difference between the ex ante yield to maturity of the bond j issued by firm i in year t and the yield on an equivalent maturity US Treasury bond. We estimate this model following the same approach that we used in our investigation of the gross spreads of bonds. We also account for the same set of firm–specific controls, X_{it-1}, that we used to investigate these spreads. In our investigation of ex ante credit spreads, we expand the set of bond controls, $Y1_{ijt}$, that we used before and include dummy variables for: callable bonds, $CALLABLE$; bonds with a sinking fund, $SINKING\ FUND$; shelf issues, $SHELF$; and bonds with a put option, $PUT\ OPTION$. We further account for our bank–related control variables, $Y2_{ijt}$, as defined above because Fang (2004) finds that reputable banks obtain lower ex-ante yields on the bonds they underwrite, and because firms' relationships with banks will likely alleviate information frictions and consequently make it easier for underwriters to place these firms' bonds.

Lastly, as before, we account for a set of variables, Z_t, that are unrelated to firm and bond characteristics but which are likely to affect bonds' ex-ante credit spreads. We include in this set $AAA\ YIELD$ (Moody's index on the yield of triple-A rated bonds) and $BBB-AAA\ SPREAD$ (difference between the Moody's indexes on the yields of triple-A and triple-B rated bonds) to account for the state of the bond market at the time of the debt IPO. We also include in this set the $TREASURY\ SLOPE$ (the difference between the yields of Treasuries with 30 year and 5 year maturity) to account for the state of the economy at the time of the debt IPO. Following the finding of Fama and French (1989), Santos (2005), and others, that recessions increase the credit spreads of bonds we include in our model the dummy variable $RECESSION$, which takes the value 1 if the bond was issued during a recession.

As in the case of the gross spreads, and for the same reasons, we estimate our model of ex-ante credit spreads with and without the controls that account for bond characteristics, *Y1*. We also estimate these models both with a pooled regression and firm fixed effects.

Costs: Abnormal credit spreads

The last segment of our methodology to investigate if it is costly to enter the public bond market for the first time is designed to detect another source of the cost that firms incur to accessing this market: underpricing at the time the bond is introduced in the market. In order to investigate if IPO bonds suffer from more underpricing than public bonds of seasoned issuers, we started by computing the yields on public bonds in the secondary market when they first trade and then compared these yields with the bonds' ex–ante yields. To this end, we estimate the following model

$$ABN\ SPREAD_{ijt} = c + \beta\ IPO_{ijt} + X'_{it-1}\,\psi + Y1'_{ijt}\,\nu + Y2'_{ijt}\,\mu + Z'_t\,\eta + \epsilon_{ijt}. \tag{3}$$

where $ABN\ SPREAD_{ijt}$ is the percentage point difference between the ex ante yield spread on the bond j issued by firm i in year t, and the secondary market yield spread on this bond when it first trades, provided this occurs within one month from the issuance date. These spreads are computed over the Moody's daily bond yield index with the same rating of the bond.

We estimate this model following the same approach and controlling for the same set of firm, bond and other variables that we used in our model of ex ante credit spreads. Given that our spreads are now computed over an index of bond yields with the same rating of the bond, however, we do not control in this test for the yields of triple-A rated bonds, $AAA\,YIELD$.

As before, we investigate the underpricing of IPO bonds with and without bond characteristics covenants *Y1*. In contrast to our previous tests, because our data source on market yields starts only in the mid-1990s and because not all bonds trade within one month after their issuance date (at least according to our data source), we do not have enough observations to investigate if the underpricing of bond IPOs is different from the underpricing of public bonds subsequently issued by the same firms. In other words, we do not have enough observations to identify our key variables with firm fixed effects. For this reason, when we investigate the underpricing of IPO bonds we rely only on pooled regressions.

Benefits: loan spreads

In contrast to the first part of our methodology, which focuses on the costs of entering the public bond market, the second part of our methodology focus on a potential benefits to firms

from entering this market. Specifically, we investigate if firms' entry to the public bond market lowers the cost they pay to raise funding in the private bond market or from banks. Because, firms issue a reduced number of private bonds after they enter the public bond market, in this case we limit our investigation to a univariate analysis of the costs that firms incur to issue private bonds after their bond IPOs with the costs they use to pay beforehand. To investigate the impact of entering the public bond market on the cost of borrowing from banks, in addition to a similar univariate analysis, we also estimate the following model of loan spreads

$$LOAN\ SPREAD_{ijt} = \alpha_i + \beta AFTER\ IPO_{ijt} + X'_{it-1}\,\psi + Y3'_{ijt}\,\nu + Y4'_{ijt}\,\mu + Z'_t\,\eta + \epsilon_{ijt}. \quad (4)$$

where $LOAN\ SPREAD_{ijt}$ is the spread over Libor at issue date for loan j issued to firm i in year t, which is a standard measure of loan pricing. $AFTER\ IPO$ is a dummy variable that takes the value 1 for the loans that firm i takes out after it undertakes its bond IPO. In some specifications, we replace this dummy variable with dummy variables that account for the credit rating of the firm's IPO bond in order to investigate if the benefits from entering the public bond market vary with the risk of the firm. To this end, we add the dummy variables $AFTER\ IGRADE\ IPO$ and $AFTER\ BGRADE\ IPO$, which take the value 1 for the loans after the IPO of firms that enter the bond market with an investment grade and below grade rated bond, respectively. Lastly, in some specifications, we limit our sample of the post IPO loans to those loans firms take out in the year immediately after them entering the bond market in an attempt to isolate the effects of debt IPO from other developments that could potentially affect the cost of bank credit for these firms.

We estimate the effects of entering the public bond market on loan spreads, controlling for the set of firm–specific variables, X_{it-1}, that we used before, and for the set of controls Z_t, which are unrelated to firms and loans but that are likely to play a role on loan spreads. Also as before, we include bank–related controls $Y3_{ijt}$. In this case, we use only one variable $LRELATIONSHIP$, lending relationship, which is equal to 1 if one of the lead managers of a syndicated loan was a lead manager on a prior loan to the same firm in a last year.[13] We focus on this variable because several studies, including Petersen and Rajan (1994), Berger and Udell (1995) and Santos and Winton (2005), find that lending relationships affect the interest rates banks charge their borrowers.

Finally, we control for the set $Y4_{ijt}$ of loan features that are likely to affect loan interest rates. This set includes the loan amount in 1980 dollars, $AMOUNT$; the loan maturity in years, $MATURITY$; dummy variables for secured loans, $SECURED$, senior loans, $SENIOR$, loans to borrowers that face dividend restrictions in connection with the loan, $DIVIDEND\ REST$, loans to borrowers with a guarantor, $GUARANTOR$, and loans to borrowers with a sponsor,

[13] Our results do not change if we consider the last three years instead.

$SPONSOR$. This set also includes dummy variables for loans that are a renewal of an existing loan, $RENEWAL$, and for syndicated loans, $SYNDICATED$. This set further includes dummy variables to control for the loan purpose (corporate purpose, $CORPORATE\ PURP$; repay existing debt, $REFINANCE$; finance a takeover, $TAKEOVER$; and working capital purpose, $WORKING\ CAP$) and dummy variables to control for the type of the loan contract (line of credit, $CREDIT\ LINE$; term loan, $TERM\ LOAN$; and bridge loan, $BRIDGE\ LOAN$).

We estimate our models of loan spreads both with and without our set of loan controls because some of these controls may be jointly determined with loan spreads. Finally, as in our investigation on the costs of bond underwriting, and for the same reasons, we estimate our model of loan spreads first based on a pooled regression and subsequently with firm fixed effects.

2.2 Data

The data for this project came from several sources. We use the Securities Data Corporation's (SDC) Domestic New Bond Issuances database to identify the nonfinancial firms that issued bonds in the United States since 1970, and to select the first nonconvertible public bond issued by these firms, that is, their IPO bonds. This database contains information on virtually all public bonds issued in the United States since 1970. We also use this database to identify which of these firms issued private bonds prior to their bond IPOs, and to gather information on the bonds relevant to our study, including their date of issue, their gross and ex ante yield spreads, their maturity and credit rating, and their underwriters. Lastly, we use the SDC database to identify firms' investment banking relationships with the underwriters of their IPO bonds.

We obtain secondary market bond prices from the National Association of Insurance Commissioners (NAIC). This database includes prices of all purchases and sales of publicly traded bonds by insurance companies since 1995. Researchers increasingly use this database to investigate the pricing of bonds because it only reports secondary market prices, not trader quotes.[14] A potential concern with the NAIC database is that it only includes the prices of transactions done by insurance companies. However, insurance companies are important participants in the corporate bond market. According to Campbell and Taksler (2003) insurance companies hold about a third of all corporate bonds.

We use the Loan Pricing Corporation's (LPC) Dealscan database to identify the firms in our sample that borrow from banks during our sample period. This database contains information on some non-syndicated loans, but most of its entries are syndicated loans. It goes

[14]See Campbell and Taksler (2003), Krishnan, Ritchken, and Thomson (2005), and Cai, Helwege, and Warga (2005) for other studies of bond prices that use the NAIC data.

as far back as the beginning of the 1980s. In the first part of that decade the database has a somewhat reduced number of entries but its comprehensiveness has increased steadily over time. We also use this database to obtain information on individual loans, including their date, purpose and type, spread over Libor, maturity and seniority status, and to collect information on the lending syndicate, including the identity and number of banks in the syndicate. Lastly, we rely on the LPC database to identify firms' bank lending relationships.

We use Compustat to gather information on firms' balance sheets, and to identify firms' industries, as defined by their 1-digit SIC codes. We use the firm's most prevalent SIC code for firms that switched industries during our sample period. We also rely on Compustat to determine firm's age at time of their bond IPOs. We determine this age by subtracting the date when the firm first appeared in Compustat from the date when it issued its first public bond. Compustat is fairly comprehensive on publicly listed firms, but it does not report data on private firms. For this reason we drop private firms from our sample. We also exclude financial firms and firms for which our control variables are missing in Compustat.

We use the Center for Research on Securities Prices's (CRSP) data to link companies and subsidiaries that are part of the same firm, and to link companies over time that went through mergers, acquisitions or name changes. We then use these links to merge the LPC-SDC-Compustat databases.[15]

Finally, we use the Moody's yield indices on seasoned corporate bonds to control for pricing changes in the bond market, and the Stock-Watson Experimental Coincident Recession Index to control for the state of the economy at the time of bond IPOs. The Moody's indices track the performance of US-dollar denominated corporate debt issued in the US domestic bond market. The Stock-Watson index is a monthly index which measures the probability that the economy is in a recession.[16]

[15]The CRSP database is first used to obtain CUSIPs for the companies in LPC where this information was missing through a name-matching procedure. With a CUSIP, LPC could then be linked to both SDC and Compustat, which are CUSIP based datasets. We proceed by using the PERMCO variable from CRSP to group companies across CUSIPs, since that variable tracks the same company across CUSIP and ticker changes. We adopt a conservative criteria in this matching process by dropping the companies that could not be reasonably linked.

[16]Because we want to control for important recessions, as opposed to just short periods of slow output growth, we identify recessions as any period of time of four (or more) consecutive quarters with a quarterly Stock-Watson index larger than the index's life-time mean (this index started in 1959). This resulted in three recessions during our sample period: 1981:2 – 1983:1; 1990:3 – 1991:2 and 2000:4 – 2002:1. These recessions overlap with the three recessions that existed during that period according to the National Bureau of Economic Research Business Cycle Dating Committee. See Stock and Watson (1989) for further details on this index.

2.3 Sample characterization

Table 1 characterizes our sample of firms. The top panel compares our sample of 817 bond-IPO firms the year before they issue their first public bond with these same firms one year after the IPO. The bottom panel compares instead our sample of bond IPO firms at the end of sample period (2002) with a set of firms that by then had not undertaken their bond IPOs yet.

As we can see from the top panel of the table, subsequent to firms' entry to the public bond market, their assets and sales grow significantly. Bond IPOs also seem to have a negative impact on firms' risk. These IPOs increase firms' leverage and reduce their interest coverage. They further increase these firms' earnings volatility and lower their returns on assets, though, by amounts that are not statistically different from zero.

Insert table 1 about here

Given these changes, our results in the bottom panel of table 1 showing that by the end of the sample period bond IPO firms are larger (both in assets and sales) than firms which had not undergone their bond IPOs yet is not surprising. In contrast with the changes we detected at the time of the bond IPO, by the end of the sample period firms that underwent their bond IPOs have higher returns on assets and lower earnings volatility than firms that are yet to issue their first bond the in the public bond market. Overall these results seem to suggest that firms which enter the public bond market do so to finance growth, but as a result they become riskier. Their profitability increases in the long run, but not immediately after their bond IPOs.

3 Are bond IPOs costly to firms?

In order to determine if it is costly for firms to enter the public bond market, we begin by investigating if underwriting costs are higher for IPO bonds. We attempt to answer this question by investigating the gross spreads and ex ante credit spreads of IPO bonds. We then investigate another source of the cost to issue in the public bond market: underpricing. Specifically, we investigate if underpricing is higher for IPO bonds. We test these hypotheses first through a univariate analysis, and subsequently through a multivariate analysis.

3.1 Univariate analysis

Table 2 presents the results of our univariate analysis. The top panel investigates the cost of entering the public bond market by comparing the gross spreads on IPO bonds with the gross spreads on the public bonds that our bond IPO firms issue afterwards. The left side of the top panel limits this comparison to the IPO bond and the first bond that firms issue after their

bond IPOs. The right panel, in turn, considers all of the public bonds firms issue after their bond IPOs. No matter which control group we use, the results show that IPO bonds carry higher gross spreads. The results also show that the difference in gross spreads is largest for firms that enter the public bond market with a bond rated below investment grade.

The mid panel of Table 2 reports the results of similar comparisons, but this time for the ex ante credit spreads, computed as the difference between the primary market yield spreads and the Treasury with the same maturity of the bond. Note the similarities between the two top panels of Table 2. As with the gross spreads, we find that, on average, IPO bonds carry higher ex ante credit spreads than the public bonds that firms issue subsequently to their entry to the public bond market. Also, as with gross spreads, the difference in the credit spreads is largest for firms that enter the public bond market with a bond rated below investment grade. Together with the previous findings, these results suggest underwriting costs make it costly to enter the public bond market, particularly for risky firms.

Insert table 2 about here

The bottom panel of the table investigates another source of the cost to enter the public bond market: underpricing. To this end we compare the yield spreads of bonds in the primary market (over the Moody's index on bond yields with the same rating of the bond) with these spreads in the secondary market when bonds first trade (provided the bond trades within one month from its issue date). The left side of the bottom panel reports the results of this comparison for the IPO bonds in our sample. According to our results, on average, IPO bonds are underpriced in the sense that their yield spreads in the primary market are higher than their yield spreads in the secondary market at the time of their first trade. While underpricing appears to affect all of the IPO bonds, the effect is substantially larger for firms that enter the public bond market with bonds rated below investment grade. The right side of the top panel reports the results of a similar comparison but this time for the public bonds that our firms issue subsequently to their entry to the public bond market. As with the IPO bonds, our results show that yield spreads in the primary market are higher than spreads in the secondary market when bonds first trade. Importantly, comparing the results in the two panels, it is apparent that underpricing is higher for IPO bonds, in particular for the IPO bonds that are rated below investment grade. These results, therefore, suggest that underpricing adds to the cost to first enter the public bond market, particularly for risky firms.

In sum, the results of our univariate analysis suggest that it is costly, particularly for risky firms, to enter the public bond market because firms pay higher underwriting costs to issue their IPO bonds and because these bonds suffer from more underpricing than non–IPO bonds. Our results also suggest that these costs are economically meaningful. For example, on

average, gross spreads are 115 bps higher for IPO bonds than for the next bond that firms issue in the public bond market. Looking at the ex–ante credit spreads computed over the Treasury with the same maturity of the bond, we also find that these spreads are on average 130 bps higher for IPOs than for the next bond firms issue in the public bond market. Lastly, ex–ante yield spreads of IPO bonds over the Moody's index on bond yields with the same rating of the bond are on average 16 basis points higher than the similar yield spread on these bonds when they first trade in the secondary market. It remains to be seen, though, if these findings continue to hold once we account for the role of several factors that are known to help explain the gross spreads and the credit spreads firms pay on their public bonds. We investigate these issues next.

3.2 Multivariate analysis

In this section, we present the results of our multivariate analysis on the cost to enter the public bond market. We investigate both whether underwriting costs are higher for IPO bonds and whether these bonds suffer from more underpricing in the bond market than public bonds of seasoned issuers. As in our univariate analysis, we first investigate if firms pay higher gross spreads on their IPO bonds. Then we investigate if IPO bonds carry higher ex–ante yield spreads. Lastly, we investigate if the underpricing in the bond market is higher for IPO bonds.

3.2.1 Do IPO bonds carry higher gross spreads?

Tables 3 and 4 report the results of our multivariate analysis on the gross spreads of public bonds. Table 3 reports the results of pooled regressions and table 4 reports the results of the same regressions with firm fixed effects in order to investigate if differences in gross spreads are firm–specific. Recall that our objective is to find out if gross spreads, which are a measure of the costs of bond underwriting, are higher for IPO bonds. We attempt to identify this effect controlling first for the set of firm characteristics X_{it-1}, the set of bank characteristics Z_t, as well as the set of other controls $Y2_{ijt}$, that we discussed in the previous section (models 1 through 3). We then expand these controls to account for the bond features, $Y1_{ijt}$, that are likely to play a role on underwriting costs, (models 4 through 6). As we explained above, we choose to introduce the latter controls separately because they may be determined jointly with gross spreads.

Model 1 of Table 3 investigates whether IPO bonds carry higher gross spreads by including the IPO dummy variable in our model of bond gross spreads. As the results of this model show, on average, the gross spread of IPO bonds are 35 basis points higher than the gross spreads of seasoned public issues. This result is consistent with Gande, Puri and Saunders' (1999) finding that the gross spreads of IPO bonds are 19 bps higher than those of

seasoned public issues.

The results of model 2, which add the dummy variable $SECOND$ to our previous model of gross spreads to investigate if such costs persist beyond the IPO, are further evidence that underwriting costs are higher for IPO bonds. The second public bond the firm issues also carries higher gross spreads than subsequent bond issues, but not by as much as its IPO bond. The difference in the gross spreads of these two bonds is 18 basis points, which is statistically significant at all of the usual confidence levels. Model 3 investigates if the underwriting costs of entering the public bond market as measured by the gross spreads of bonds vary with the creditworthiness of the IPO bond as defined by its credit rating. To this end, we add to model 2 the $IGRADE$ dummy variable, which takes the value 1 for bonds rated investment grade, and the interaction of this variable with our IPO variable. The results of this model confirm that the gross spreads are higher for IPO bonds, but this is largely driven by IPO bonds that are rated below investment grade. While on average IPO bonds carry a gross spread that is 29 bps higher than the remaining bonds, those firms that enter the public bond market with a bond rated investment grade pay only an additional 6 bps. In fact, as reported at the bottom of Table 3 a test of the sum of IPO and IPO x $IGRADE$ shows that we cannot reject the hypothesis that gross spreads are not higher for IPO bonds rated investment grade as compared to non–IPO bonds.

Comparing models 1 through 3 with models 4 through 6, which add to the previous models our set of bond controls, we see that the inclusion of these controls does not change the thrust of our earlier findings. The new models continue to show that it is costly to enter the public bond market because IPO bonds carry higher gross spreads than seasoned public bonds, and this cost affects predominantly firms that enter the market with a bond rated below investment grade.

Insert table 3 about here

Regarding the coefficients of the control variables that we use in these models, they are generally consistent with the discussion given in the Methodology subsection. Older firms and larger firms pay lower gross spreads on their bonds. Similarly, safer firms, as determined by their earnings volatility, fraction of the tangible assets in their balance sheets, and interest coverage, also pay lower gross spreads on their bonds. These coefficients, however, lose significance when we account for the rating of the bond suggesting that they are important drivers of this rating.

Our results also show that bonds issued during recessions carry higher gross spreads, possibly to account for the higher risk that underwriters face to place bonds during downturns. We do not find evidence of a secular decline in gross spreads. However, consistent

with Gande, Puri and Saunders' (1999) findings, our results show that gross spreads declined following commercial banks entry in the bond underwriting business as the coefficient on our $AFTER$ 1988 is negative and statistically significant. Consistent with Livingston and Miller (2000) and Yasuda (2004), our results show that larger investment banks charge lower gross spreads on the bonds that they underwrite. This is possibly attributable to the fact that these banks, which tend to have a higher reputation, also tend to underwrite safer bonds. Our results further show that having a relationship with the underwriter lowers the gross spreads on the public bonds the firm issues, but by an amount that is not statistically different from zero.[17] This result is in line with Yasuda's (2004) and Drucker and Puri's (2005) finding that bond issuers earn a statistically significant fee discount when they have a lending relationship with their underwriters.

Lastly, with respect to the bond controls that we account for, our results show that the size of the issue does not affect gross spreads. It is possible that this effect is picked up by the size of the firm as the two variables are strongly correlated and the size of the firm comes out statistically significant. Our results also show that longer maturity bonds carry higher gross spreads, which is likely attributable to the higher risk of these bonds.

In sum, the results we presented thus far show that IPO bonds carry higher gross spreads, and this premium is largely driven by firms that enter the public bond market with a bond rated below investment grade, i.e. riskier firms. We cannot reject the hypothesis that investment grade IPO bonds are not subject to a premium. Given that we find these results with pooled regressions, it is unclear whether they are firm specific or driven by differences across firms. To account for the potential implications of firm differences we reestimate our models in Table 3, but this time with firm fixed effects. This is a stricter test of the cost to enter the public bond market because it compares the gross spread on the IPO bond with the gross spreads the same firm pays on its subsequent public bond issues.

The results of our fixed effects models are reported in Table 4. According to them, the coefficient on our IPO dummy variable continues to be positive and statistically significant in our base model. Note, however, that this coefficient is substantially smaller than in our pooled regression; it indicates that firms pay on average 19 more bps on the gross spread of their IPO bonds than on the public bonds that they issue afterwards. As with our pooled regressions, we also find that firms pay higher gross spreads on the second bond they issue in the public bond market, as the coefficient on our $SECOND$ dummy variable is positive and significant (model 2). Firms pay an extra 11 bps on their first public bond than on their second bond, a difference which is statistically significant at all the usual levels of confidence.

[17] The same applies to IPO bonds. In several tests we conducted (not shown in our tables) the interaction of IPO with $RELATIONSIP$ is usually not statistically significant.

In contrast with our findings based on pooled regressions, the results of the fixed effects models show that the premium in the gross spreads that firms pay on their IPO bonds does not vary significantly with the credit rating of the IPO bond. As we can see from Model 3, even though the coefficient on the interaction of our IPO dummy variable with the $IGRADE$ dummy variable is negative, it is not statistically significant. Indeed, we can confirm by an F-test, shown at the bottom of the table, that the firms that enter the public bond market with an investment grade bond, pay higher gross spreads on their IPO bonds than on the bonds that they issue afterwards. In other words, these firms also pay a premium on the gross spreads they pay underwriters when they issued their first public bond.

The thrust of these findings continue to hold when we account for the size of the bond issue and its maturity (models 4-6 of Table 3). In this case, however, the F-test on whether firms that enter the public bond market with investment-grade bonds pay higher gross spreads on their IPO bonds is only significant at the 12% level of significance.

Insert table 4 about here

With respect to the controls that we use in our gross spread models, they suggest results which are similar to those we find in our pooled regressions, with the exception of the firm-specific controls, which, in general, are no longer statistically significant.[18] This was to be expected, however, given that the latter models are estimated with firm fixed effects.

In conclusion, the results we find in this subsection show that IPO bonds carry higher gross spreads than seasoned public bonds issued by the same firms. Our results also show that firms continue to pay a premium on the gross spread of the second bond they issue in the public bond market, but this premium is not as large as that they pay on their IPO bonds. Finally, our results show that firms which enter the public bond market with an investment grade rated bond pay a lower "entry" premium than those that do so with a below grade rated bond, but the difference between the two is not statistically significant. These results, therefore, suggest that the compensation firms have to pay underwriters to access the public bond market makes it costly to *all* firms to first enter this market.

3.2.2 Do IPO bonds carry higher ex–ante credit spreads?

The results of the previous subsection show that the compensation firms pay underwriters is higher for their IPO bonds than for the public bonds they issue afterwards. We have interpreted this difference as evidence that it is costly to first enter the public bond market. It is possible,

[18]The bank relationship variable drops out in our fixed effects estimation because it does not vary over time. Recall that this dummy variable is equal to one if the firm had issued a public bond to or took a syndicated loan from a bank that participated in the underwriting syndicate of its bond IPO.

however, that underwriters compensate firms for this extra cost by guaranteeing them a higher price on their IPO bonds than the price they guarantee firms on their subsequent issues. We do not have information on the price that underwriters guarantee firms. However, by looking at the ex–ante yield spreads on IPO bonds, and indirectly on the offer prices of these bonds, we can ascertain if that substitution effect is present or if in contrast firms receive lower guaranteed prices on their IPO bonds, which would constitute further evidence on the cost of entering the public bond market.

To this end, we investigate the ex–ante credit spreads (over Treasury with the same maturity) of IPO bonds in this subsection following the same approach we adopted in the previous subsection to investigate the gross spreads. The results are reported in Tables 5 and 6. As before, Table 5 reports the results on pooled regressions and Table 6 reports the results with firm fixed effects. Also as we did in the previous subsection, and for the same reasons, the first set of regressions in each table controls for the firm characteristics X_{it-1}, and our set of additional controls that is unrelated to bond characteristics Z_t, as well as bank–related controls $Y2_{ijt}$. The second set of regressions, adds to these regressions our set of bond controls $Y1_{ijt}$.

As the results of model 1 of Table 5 show, on average, the credit spreads of IPO bonds in the primary market are 86 basis points higher than the credit spreads of seasoned bonds. This finding is consistent with Gande, Puri and Saunders' (1999) finding that the ex ante credit spreads of IPO bonds are 21 bps higher than those of seasoned public issues.

According to model 2, firms continue to pay a premium when they issue their second bond in the public bond market, but it is not nearly as large as the premium they pay on their IPO bonds. The difference between the credit spreads of the first two bonds is 54 basis points, which is statistically significant at all the usual levels of significance. Lastly, according to the results of model 3, the premium that firms pay on the ex–ante credit spreads of their IPO bonds affects only firms that enter the public bond market with a bond rated below investment grade. Firms that enter the public bond market with an investment grade rated bond incur an additional cost of issuing an IPO bond of only 4 bps, suggesting therefore that the IPO premium is driven entirely by firms that enter the public bond market with a speculative grade bond. A test of the sum of IPO with $IGRADE$ reported at the bottom of Table 5 indicates that we cannot reject the hypothesis that ex ante credit spreads on IPO bonds are not higher for IPO bonds rated investment grade as compared to non–IPO bonds.

Comparing models 1 through 3 with models 4 through 6, which add to the previous models our set of bond–specific controls, we see that while the magnitude of the IPO effects is now smaller. However, adding these controls does not change the thrust of the key findings we identify based on the former models.

Note that the results we find based on credit spreads, namely that IPO bonds carry higher ex–ante credit spreads and this premium is largely driven by firms that enter the public bond market with a bond rated below investment grade, parallel our findings on gross spreads. This suggests that underwriters do not compensate firms for the extra gross spread they charge them on their IPO bonds by offering them higher guaranteed prices on these issues. It remains to be seen, however, if this parallel between gross spreads and ex–ante credit spreads continues to hold when we estimate our models of credit spreads with firm fixed effects. Before we investigate this issue, we now turn our attention to the control variables on the models reported in Table 5.

Insert table 5 about here

The coefficients on the firm control variables that we use in these models are generally consistent with the discussion given in the Methodology subsection. Older firms, larger firms, and firms with more tangible assets, which are usually safer firms, pay significantly lower credit spreads. The variable proxying for advertising and R&D expenses has an insignificant effect, except when we account for the rating of the bond (model 3 and 6), but its coefficient has an expected sign: firms' with more of these expenses pay higher credit spreads on their bonds. The investment to assets ratio comes in positively (except in the last model), and thus consistent with a demand effect: firms with larger investments may have to offer higher spreads in order to accommodate larger bond issues. The fact that this variable looses significance when we account for the size of the issue indeed suggests that there is a demand effect on bond credit spreads. The proxies for default risk — return on assets, interest coverage, leverage, and earnings volatility — all have their expected signs, and all are strongly significant in the models where we do not account for the credit rating of the bond. When we control for this rating, with the exception of the return on assets, all of these variables lose significance, suggesting that they are key drivers of bonds' credit ratings.

Our controls for the economy and the state of the bond market show that ex–ante credit spreads are higher in recessions and when the slope of the bond yield curve is steeper. According to our results, ex–ante credit spreads are negatively related with the slope of the Treasury yield curve.[19] Our results show that the underwriter's reputation, as proxied by its market share, does not affect bonds' ex–ante credit spreads. The coefficient on this variable is negative but is never statistically significant. This contrasts with the (significant) negative impact that the underwriter's reputation has on bonds' gross spreads. As with gross spreads, however, our results show that firms' relationships with underwriters do not affect the ex–ante

[19]Duffee (1996), Collin-Dufresne, Goldstein and Martin (2001) and Santos (2005) also find that bond spreads are lower when the yield curve is steeper.

credit spreads on their bonds.[20] Lastly, our bond–related control variables show results that are consistent with the literature on bond credit spreads. In particular, they show that larger bond issues, callable bonds and bonds with a sinking fund carry higher credit spreads. They also show that longer maturity bonds, shelf bonds as well as bonds with a put option carry lower credit spreads.

The results we have discussed thus far do not account for potential systematic differences across firms. Recall that in our analysis of gross spreads, these differences play an important role in identifying how the cost of entering the bond market varies with the credit rating of the IPO bond. For this reason, we reestimate the models we presented in Table 5 with firm fixed effects. The new results are reported in Table 6.

Comparing the results in tables 5 and 6, it is apparent that adding firm fixed effects does not affect our key variable of interest, IPO. This variable continues to enter positively and significantly, indicating that firms pay higher ex–ante credit spreads on their IPO bonds than on the public bonds that they issue subsequently. As with our findings on gross spreads, however, adding firm fixed effects generates a lower premium on the credit spreads of IPO bonds.[21] When we add firm fixed effects, the coefficient on the dummy variable for the second bond the firm issues in the public bond market, $SECOND$, is no longer statistically significant, indicating that the premium on the ex–ante credit spreads is limited to the IPO bond. Similarly, the coefficient on the interaction of the IPO bond dummy variable with the investment grade dummy variable, IPOx$IGRADE$, continues to be negative but is no longer statistically significant. However, since the coefficients on IPO and IPOx$IGRADE$ are not independent, we can obtain additional information from testing the joint hypothesis that for the investment grade bonds, the effect of the IPO is zero. The F-test, presented in the bottom of Table 6 confirms, like in the pooled regression, that we cannot reject the hypothesis that firms that enter the public bond market with a bond rated investment grade pay the same ex–ante credit spread on their IPO bonds as on their subsequent bonds, i.e. they experience no underpricing in terms of ex–ante credit spreads. Recall that we were able to reject this hypothesis in our investigation of gross spreads. Thus, while safer firms pay a premium on the gross spreads of their IPO bonds they do not appear to be charged a premium on ex-ante credit spreads of these bonds. In contrast, riskier firms pay a premium on both of these spreads on their IPO bonds.

Insert table 6 about here

[20] Our findings on the impact of underwriter's reputation on bonds' gross spreads and ex ante credit spreads are similar to those of Roten and Mullineaux (2002), but differ somewhat from those of Fenn (2002) who find that larger investment banks obtain lower ex ante yields but charge higher fees.

[21] Although the effects we find are still larger than those in Gande, Puri and Saunders' (1999).

As for our firm controls, most of them lose significance which was to be expected given that models are estimated with firm fixed effects. The same happens to many bond controls, including the maturity of the bond, and the sinking fund and shelf indicators, suggesting that these characteristics do not vary much across the bonds of each firm. The only variable that did not enter significantly in our pooled regressions but entered significantly in our fixed effects regressions is the market share of underwriters, indicating that firms pay lower credit spreads when they use large underwriters. This variable, however, looses significance when we add our set of bond controls.

In conclusion, the results we unveiled in this subsection show that IPO bonds carry higher ex–ante credit spreads than seasoned bonds even when we limit the comparison within firms. In other words, firms pay higher ex–ante credit spreads on their IPO bonds than on the bonds that they issue subsequently in the public bond market. Our results also show that this yield premium is limited to IPO bonds; it is not present on the second bond that firms issue in the public bond market. They further show that the yield premium that IPO bonds carry is largely driven by below investment grade IPO bonds.

These results are very similar to our findings in the previous subsection on gross spreads. This parallelism is important because it disproves the possibility that higher gross spreads on IPO bonds do not translate into higher costs to firms because underwriters compensate issuers by offering them higher guaranteed prices on their IPO bonds. The results of these two subsections, therefore, show that the additional compensation firms have to pay underwriters to issue their IPO bonds alone, particularly those firms whose IPO bonds are rated below investment grade, makes it costly to them to first enter the public bond market. Importantly, according to our results this cost is economically meaningful. Note, for example, that even if the bond prices underwriters guarantee issuers were the same for IPO bonds and non–IPO bonds, the 19 bps premium that firms pay on the gross spreads of their IPO bonds alone translate into an additional $19,000 for an IPO issue of $10 million. The evidence we present in this subsection showing that ex–ante credit spreads are higher for IPO bonds suggests, however, that underwriters may indeed offer issuers lower guaranteed prices on their IPO bonds than on the public bonds they issue afterwards, which further adds to the underwriting costs firms have to pay to gain access to the public bond market.

The costs of entering the public bond market may not be limited to the additional compensation firms have to pay bond underwriters. As with the decision to float the equity, entering the public bond market may also be costly because of the underpricing firms have to offer in order to attract demand for their IPO bonds. We investigate this possibility in the next subsection.

3.2.3 Do IPO bonds suffer from more underpricing in the secondary market?

In order to investigate if IPO bonds suffer from more underpricing in the bond market than public bonds of seasoned issuers, we estimate our model of the difference between the spreads in the primary market and the spreads in the secondary market when IPO bonds first trade. We compute these spreads over the Moody's index of bond yields with the same rating of the bond on the issuance day and first trading day, respectively. We consider in this test only bonds whose first trade is within one month of the issue date and for which we have all the necessary data to compute the bond's yield at that time.

These requirements in conjunction with the low trading frequency of bonds and the fact that our data source on market prices goes back only to 1995, leaves us with a much smaller sample of bonds (63 IPO bonds and 296 non-IPO bonds). For this reason, in this section we investigate whether IPO bonds suffer from more underpricing based on pooled regressions alone. The results of our model on market underpricing are reported in Table 7. They follow the same approach we adopted in the previous subsections, that is, we first investigate if market underpricing is higher for IPO bonds than for seasoned bonds controlling for the set of firm characteristics X_{it-1}, and the set of additional controls that is unrelated to bond characteristics Z_t, as well as bank–related variables $Y2_{ijt}$ (models 1 through 3). The second set of regressions in the table (models 4 through 6), adds to these controls our set of bond controls $Y1_{ijt}$.

The first model of the table investigates the underpricing of IPO bonds by including the IPO dummy variable in our model of the difference between the bond spreads (over the Moody's index) in the primary and secondary markets. As the results of this model show, IPO bonds suffer from more market underpricing than seasoned public issues but the difference between them is not statistically significant. This result differs from Cai, Helwege and Warga (2005) in that they find that underpricing is statistically significantly higher for IPO bonds than for non-IPOs', a difference which may be attributable to the larger share of speculative grade bonds that they have in their sample of IPO bonds (more on this difference below). Model 2 shows, however, that when we account separately for the pricing of the second bond that firms issue in the public bond market, we find evidence of IPO underpricing, as the coefficient on our IPO dummy variable becomes positive and statistically significant. Given that the coefficient on our second bond dummy, $SECOND$, is not statistically significant, the results of model 2 indicate that underpricing is highest for IPO bonds and it starts to decline with the next bond that firms issue after they enter the public bond market.

Model 3 investigates if the underpricing of IPO bonds varies with the bond's credit rating. According to the results of this model, firms that enter the public bond market with a bond rated investment grade suffer from less underpricing than those that do it with a bond rated below grade, but the difference in underpricing between these bonds is not statistically

significant. Again, we rely on the F-test to determine whether the difference between ex–ante and market yields is statistically significant for firms that enter the market with investment grade bond. As with ex–ante spreads above, we cannot reject the hypothesis that firms that enter the public bond market with an investment grade bond experience no underpricing with respect to secondary markets. Cai et al. do not investigate in their multivariate analysis whether underpricing of IPO bonds varies with bond credit ratings but they find that underpricing of IPO bonds is larger for speculative grade bonds in their univariate analysis, which may explain why they find that underpricing is statistically significantly higher for IPO bonds than for non-IPOs'.

These findings continue to hold when we control for bond characteristics (models 4 though 6). Note that adding these controls increases the statistical significance of our IPO dummy variable, therefore, confirming our initial finding that IPO bonds suffer more from underpricing in the bond market than public bonds of seasoned issuers.

Insert table 7 about here

With respect to the controls we consider in the multivariate analysis, most of them are not statistically significant, which was to be expected given the nature of our dependent variable. Those that are significant show that underpricing increases with the maturity of the bond and the slope of the bond yield curve (as determined by the difference between the spread of the triple-B rated bonds and that of triple-A rated bonds), and it is higher for bonds with a sinking fund. These effects are likely due to the fact that the Moody's yield indexes we use to compute bond spreads in the primary and secondary markets do not perfectly match the credit rating and maturity of the bonds in our sample.[22] The sinking fund effect is also likely due to the fact that our dummy variable for the existence of a sinking fund does not capture all different aspects that characterize these funds.

The last control variable that enters significantly in our models is the market share of underwriters. According to our results, bonds underwritten by large banks suffer from less underpricing. This market share is often assumed to be correlated with the reputation of the underwriter. This suggests that IPO bonds brought to the market by higher reputation underwriters suffer from less underpricing. Given this finding, the absence of an effect of the firm's relationship with its underwriter is however somewhat surprising and contrasts with Schenone's (2004) finding that firms' relationships with their underwriters reduce the underpricing of their equity IPOs. Our results show that this relationship is beneficial in that it reduces underpricing, but by an amount that is not statistically different from zero.

[22]Moody's has individual yield indexes only for whole credit ratings. In addition, Moody's individual yield indexes are not broken down by bond maturity.

Summing up, the results we unveiled in this subsection together with those we presented in the previous two subsections portray a very clear picture of the costs firms have to incur to first enter the public bond market. These costs arise from both the extra compensation they have to pay underwriters of their IPO bonds and from the additional underpricing their IPO bonds face in the secondary bond market. Another robust result of our analysis is that these costs are higher for firms that enter this market with a bond rated below investment grade. In fact, firms that enter the market with an investment grade bond experience only higher gross spreads, and the premium they pay is not as large as that incurred by firms whose IPO bond was rated below investment grade. Now that we have established that it is costly to enter the public bond market, the natural question to ask is whether firms benefit from entering this market. We investigate this issue next.

4 Do firms benefit from their bond IPOs?

We investigate if entry to the public bond market is beneficial to firms by looking at the impact of this decision on their cost to raise external funding through private bond placements and bank loans. We investigate these benefits by comparing the cost firms pay to raise funding from these sources after they enter the public bond market with the cost they used to pay beforehand. As in the previous section, we first investigate these issues through a univariate analysis and subsequently through a multivariate analysis. In the case of private bond placements, though, we limit our analysis to a univariate analysis because of the reduced number of private bonds that firms issue after they enter the public bond market.

4.1 Univariate analysis

In order to investigate if firms benefit from entering the public bond market, we compare for the two financial instruments under consideration (private bonds and loans) the cost that firms paid to raise funding through them before entering the public bond market with the cost they pay afterwards. As a robustness check, we also compare the former cost with the average cost that firms pay after they enter the public bond market. As we did in the previous section, we do these comparisons for our sample of bond IPO firms as well as the subsamples of firms that entered the public debt market with an investment–grade and below–grade rated bond respectively. The results of these tests are reported in Table 8. The first two panels of the table report the results for private bonds (the top panel compares the gross spreads and the middle panel compares the ex–ante yield spreads). The bottom panel reports the results for loan spreads.

The results on the gross spreads of private bonds suggest two important insights. First,

after firms enter the public bond market, they pay lower gross spreads on their private bond placements. Second, this reduction affects only firms that enter the public bond market with a bond rated investment grade. According to our univariate comparisons the reduction in the underwriting costs of private bond placements is economically meaningful. Firms that enter the public bond market with an investment grade bond, benefit from a reduction of 103 bps in the gross spread on private bond placements.

To find out if these savings were not erased by a reduction in the guaranteed price offered by bond underwriters, we follow the same approach we adopted in the previous section and investigate the ex–ante credit spreads on private placements. The results of our tests on these spreads, reported in the middle panel of Table 8, are very similar to those reported in the top panel for gross spreads. The reduction in the ex ante credit spreads that followed firms' entry to the public bond market suggests that the reduction in the gross spreads we reported above likely represents a reduction in the cost of private bond financing attributable to firms entry to the public bond market.

Insert Table 8 about here

The bottom panel of Table 8 presents the results of similar comparisons, but for the spreads on the loans that firms take after they enter the public bond market with the spreads on their loans they took out beforehand. As in the case of private bonds, our results on bank loans indicate that only firms that enter the public bond market with an IPO bond rated investment grade benefit from a reduction on the cost of their bank funding. For these firms, entering the public bond market resulted in immediate savings of 138 basis points on the spread over Libor of their bank loans.

In sum, the results of our univariate analysis suggest that firms' that enter the public bond market, in particular those that do it with a bond rated investment grade, benefit from significant savings on the cost they pay to raise external funding in the private bond market and the syndicated loan market. It remains to be seen if these results continue to hold when we account for all of the variables that are likely to help explain the credit spreads on these financial instruments, and also if they are not derived from differences across firms. Note that our univariate analysis compute the gains from entering the public bond market vis-á-vis what the bond IPO firms used to pay beforehand as well as the firms that never issued a public bond. We investigate these issues next. We limit our multivariate analysis to the effect of entering the public bond market on the cost of bank lending because of the reduced number of private bond placements that our bond IPO firms make afterwards.

4.2 Multivariate analysis

We investigate the impact of firms' entry to the public bond market on the interest rates they pay on their bank loans following a strategy analogous to that we adopted to investigate bond spreads. We first estimate our loan pricing models controlling for our set of firm characteristics, X_{it-1}, and our set of other controls unrelated to the loan characteristics, Z_t,, as well as the bank relationship variable $Y3_{ijt}$. We then augment these models to account for our set of loan controls $Y4_{ijt}$. As before we first estimate our models with a pooled regression and subsequently with firm fixed effects.

Table 9 reports the results of our pooled regressions. Model 1 compares the spreads on loans taken out by firms after they enter the public bond market with the spreads on their loans before their debt IPO and the spreads on the loans taken out by those firms that did not issue public bonds during our sample period (or beforehand). The results of this model suggest that entering the public bond market does not lower the cost of bank funding on average. Model 2, however, shows that this result derives from the opposite effect that entry in the public bond market has on loan spreads for firms that enter this market with a bond rated investment grade versus those that do so with a bond rated below investment grade. While the former firms enjoy savings on their loan spreads averaging 41 bps the latter firms pay an additional 25 bps on the spreads of the loans they take out subsequently to their entry to the public bond market. Model 3 shows that this distinct effect from entering the public bond market for risky and safe firms continues to hold when we limit our sample of post bond IPO loans to those taken out during the first year after the bond IPO. Further, models 4 through 6 show that adding loan controls to our models of loan spreads does not change the thrust of these effects from entering the public bond market.

Insert table 9 about here

With respect to our firm control variables, their coefficients are generally consistent with the discussion given in the Methodology subsection. They show that larger firms, firms with more tangible assets, and firms with more advertising and R&D expenses pay significantly lower spreads. Older firms also appear to pay lower loan spreads, but this difference is not always statistically significant. Our proxies for default risk – return on assets, interest coverage, leverage, and earnings volatility – all but earnings volatility have their expected signs and are strongly significant. Earnings volatility has an unexpected sign but is not statistically significant.

Looking at the other controls that are not related to firm and loan characteristics, all but the term structure of interest rates affect loan spreads. The effect of the term structure is likely captured through our controls on the credit spreads in the primary bond market as

these are significant and show that loan spreads increase with the yield spread on triple-A rated bonds and with the spread between triple-B and triple-A rated bonds. These controls also show that loans spreads increase in recessions. Interestingly, our results show that there is a secular increase in loan spreads.

According to our findings, firms benefit from an interest rate discount when they borrow from banks that they have a lending relationship with, but on average this discount is not statistically different from zero. This is not entirely surprising given the mixed evidence on the impact of these relationships on loan interest rates. Berger and Udell (1995) and Santos and Winton (2005), for example, find that lending relationships lower bank funding costs, but Petersen and Rajan (1994) fail to find a link between these relationships and bank funding costs.

Finally, with respect to our loan controls, we find that larger loans have lower spreads. This could reflect economies of scale in loan size, but it may also reflect the fact that larger (hence safer) firms take larger loans, which is consistent with the decrease in the coefficient on the log of firm assets. Among the loan–purpose variables, our results show that corporate purpose loans and working capital loans as well as loans to refinance carry lower spreads. With respect to loan types, credit lines have lower spreads than term loans, which in turn are not nearly as risky as bridge loans. With the exception of seniority and the presence of guarantors, loan features that aim to increase loan safety (dividend restrictions, secured interests, and sponsors) generally have positive effects on spreads. This is consistent with the well–established result that banks tend to require these features for riskier credits (see for example Berger and Udell (1990)). Conversely, longer–term loans have lower spreads, reflecting lenders' preference for lending long-term only to safer credits. Lastly, whether the loan is syndicated or not does not appear to have an effect on the loan spread once we control for our set of loan features.

Table 10 reports the results for the same models presented in Table 9 but estimated with firm fixed effects. As in our pooled models, the fixed effect models show that firms which enter the public bond market with a bond rated investment grade benefit from a reduction on the cost they pay to borrow from banks. After they enter the public bond market, these firms benefit from a reduction on their loan spreads which ranges from 22 to 37 bps, depending on the model we consider. Note that these savings start immediately after firms enter the public bond market and are even more pronounced then, as the coefficient on our $AFTER\ IGRADE\ IPO$ dummy variable is larger when we limit our post bond IPO loans to those taken out by firms in the year following their entry to the public bond market (compare models 2 and 5 with models 3 and 6, respectively). However, these differences in coefficients are not statistically significant.

In contrast with our pooled regressions, according to our loan pricing model estimated

with firm fixed effects, firms that enter the public bond market with a bond rated below investment grade do not pay higher spreads on the loans they take out afterwards when compared to the spreads on their loans beforehand. The coefficient on $AFTER\ BGRADE\ IPO$ is now negative but not statistically significant while in our pooled regressions the coefficient on this variable was positive and significant. For these firms, therefore, entering the public bond market does not bring them any benefits on their cost of bank funding.

Insert table 10 about here

With respect to the controls we use in our models, as expected, when we add firm fixed effects we loose significance on some of our firm controls. Those that retain significance, including return on assets, advertising and R&D expenses, and interest coverage, have the same effect on loan spreads that they had in our pooled regressions. Regarding, our other controls, adding firm fixed effects does not change the impact we identified above in the discussion of our pooled regressions of these variables on loans spreads.[23]

The reduction in the loan interest rates that we find subsequent to firms' entry to the public bond market complements Schenone's (2005) finding that firms pay lower interest rates on bank loans after their equity IPOs compared to what they use to pay beforehand. Further, the differential impact that we find of the firms' bond IPOs on the cost of bank funding for safe and risky firms lends support to Rajan's (1992) hold–up theory. According to Rajan (1992), incumbent banks are able to extract more informational rents from riskier borrowers than from safer ones. This is because, as Rajan shows on his proposition 3, as the risk of the borrower increases the likelihood that outside banks make a bid to lend to the borrower decreases, consequently giving the incumbent bank an opportunity to extract additional rents from its borrowers. When firms enter the public bond market, there will be new information revealed about them which will reduce the asymmetry of information between incumbent banks and outside banks. This will increase outside banks' willingness to bid on loans to these firms. Because this effect varies inversely with the risk of the borrower, one would indeed expect, as we find, that safer borrowers benefit more from the additional competition of outside banks than risky borrowers.

[23]The lending relationship variable drops out in our fixed effects estimation because it does not vary over time. Recall that this dummy variable is equal to 1 if the firm borrowed from the lead underwriter(s) in the loan syndicate at least once in the year prior to the current loan. In Table 10, for the exposition purposes, we do not report coefficients on loan–specific control variables. They are similar to those in Table 9.

5 Final remarks

Researchers have devoted a great deal of attention to the costs and benefits to firms from floating their equity. In contrast, they have paid little attention to the potential costs and benefits to firms of their decision to first enter the public bond market, despite the fact that the public bond market is a more important source of external funding to firms than the equity market at least in the United Sates.

As we have shown in this paper, it is indeed costly for firms to first enter the public bond market and this cost affects predominantly firms that enter this market with a bond rated below investment grade, that is, riskier firms. It is costly because firms pay both higher underwriting costs and suffer more underpricing in the bond market when they issue their very first public bond. Importantly, we also find some benefits from entering the public bond market, but these accrue only to firms that enter this market with a bond rated investment grade, that is, safer firms. Subsequently to their entry in the public bond market these firms are able to borrow in the private bond market and from banks at lower interest rates. Risky firms that enter the public bond market may enjoy other benefits in connection with the introduction of public financing in their capital structure, but in contrast to safe firms we do not find that they benefit from savings in their cost of external funding in the private bond and loan markets.

In this paper we have investigated debt IPOs for firms with publicly listed stock. Despite the information that is available on these firms, residual informational frictions are likely a contributing factor for the costs these firms incur to first enter the public bond market. The new information on a firm that is revealed when it first issues a public bond, together with the scrutiny of rating agencies, bond analysts and bondholders that it becomes subject to, is likely a contributing factor for the benefits that some firms enjoy in connection with their bond IPOs. This suggests that an investigation of bond IPOs for privately held firms, for which there is less available information, is a fruitful area for future research. Furthermore, given that both the equity IPO and the bond IPO lead to profound changes in a firm, an investigation of the order that firms' choose to enter these markets also appears to be a fruitful area for future research.

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Table 1. Sample characterization[a]

Firm changes resulting form the debt IPO				
Variables	1 year before debt IPO	1 year after debt IPO	Difference	T-stat
L ASSETS	5.72	6.26	0.54***	6.06
L SALES	5.53	5.90	0.37***	3.60
ROA	0.022	0.011	-0.011	1.56
EARNINGS VOL	0.031	0.032	0.001	0.12
LEVERAGE	0.37	0.47	0.10***	6.14
TANGIBLES	0.61	0.63	0.02**	1.99
ADVERTISING+R&D	0.15	0.019	-0.13	1.02
INVESTMENTS	0.10	0.098	0.002	0.43
INTEREST COV	29.8	1.4	-28.4**	-2.06
Firms that did a debt IPO vs firms that did not do a debt IPO[b]				
	Debt IPO firms	Non IPO firms	Difference	T-stat
L ASSETS	7.97	5.27	2.70***	34.1
L SALES	7.70	5.28	2.42***	31.1
ROA	0.012	-0.034	0.046***	5.49
EARNINGS VOL	0.039	0.079	-0.040**	2.10
LEVERAGE	0.37	0.31	0.06***	3.65
TANGIBLES	0.68	0.51	0.17***	17.8
ADVERTISING+R&D	0.09	0.51	-0.42*	1.89
INVESTMENTS	0.050	0.049	0.001	0.08
INTEREST COV	11.0	15.3	-4.3	0.46

[a] $L\ ASSETS$ Log of real assets in millions of 1980 dollars computed with the CPI deflator; $L\ SALES$ real sales in millions of 1980 dollars computed with the CPI deflator; ROA return on assets (net income divided by assets); $EARNINGS\ VOL$ earnings volatility (the standard deviation of the firm's quarterly return on assets over the last three years); $LEVERAGE$ leverage ratio (debt over total assets); $TANGIBLES$ tangible assets (inventories plus plant, property, and equipment over total assets); $ADVERTISING + R\&D$ expenses with advertising and R&D scaled by the firm's sales; $INVESTMENTS$ investments scaled by its assets; $INTEREST\ COV$ the interest coverage (EBITDA divided by interest expense).
[b] Comparison performed at the end of our sample period (2002).

Source: Authors' computations.

Table 2. Sources of the cost to enter the public bond market[a]

	Gross spreads					
	IPO bonds vs. second bond			IPO bonds vs. all bonds after second		
	IPO (Obs)	Second (Obs)	Diff (T-stat)	IPO (Obs)	All after nd (Obs)	Diff (T-Stat)
ALL BONDS	2.74 (606)	1.60 (363)	1.15*** (12.90)	2.74 (606)	1.82 (371)	0.93*** (10.07)
IGRADE	1.03 (132)	0.80 (156)	0.23** (2.82)	1.03 (132)	0.94 (128)	0.09 (0.92)
BGRADE	3.06 (381)	2.30 (134)	0.76*** (9.07)	3.06 (381)	2.51 (136)	0.56*** (6.38)
	Ex-ante yield spreads over Treasury					
	IPO bonds vs. second bond			IPO bonds vs. all bonds after second		
	IPO (Obs)	Second (Obs)	Diff (T-stat)	IPO (Obs)	All after nd (Obs)	Diff (T-Stat)
ALL BONDS	3.77 (542)	2.48 (363)	1.30*** (10.79)	3.77 (542)	2.70 (365)	1.07*** (8.53)
IGRADE	1.43 (116)	1.39 (156)	0.04 (0.04)	1.43 (116)	1.45 (124)	-0.02 (-0.17)
BGRADE	4.53 (363)	3.71 (134)	0.82*** (5.70)	4.53 (363)	3.85 (137)	0.68*** (4.65)
	Ex-ante vs secondary market yield spreads (over Moody's yield index)[b]					
	Yields on IPO bonds			Yields on all bonds after the IPO		
	Ex-ante (Obs)	Market (Obs)	Diff (T-stat)	Ex-ante (Obs)	Market (Obs)	Diff (T-Stat)
ALL BONDS	1.71 (87)	1.56 (87)	0.16*** (2.90)	0.45 (360)	0.39 (360)	0.06*** (3.11)
IGRADE	0.20 (45)	0.14 (45)	0.06 (1.33)	-0.04 (280)	-0.09 (280)	0.05** (2.20)
BGRADE	3.22 (38)	2.97 (38)	0.25** (2.32)	2.09 (78)	2.01 (78)	0.07 (0.01)

[a] *IGRADE* Bonds rated investment grade by Moody's; *BGRADE* Bonds rated below grade by Moody's.
[b] Spreads computed on the Moody's yield index with the same rating of the bond.

Source: Authors' computations.

Table 3. Gross spreads of IPO bonds: Pooled regressions.[a]

Variables	(1)	(2)	(3)	(4)	(5)	(6)
IPO[(1)]	0.35***	0.48***	0.29***	0.39***	0.52***	0.35***
	(0.06)	(0.08)	(0.08)	(0.06)	(0.07)	(0.07)
SECOND		0.30***	0.16***		0.30***	0.18***
		(0.06)	(0.05)		(0.06)	(0.04)
IGRADE			-1.14***			-1.14***
			(0.09)			(0.08)
IPO x IGRADE[(2)]			-0.23**			-0.27***
			(0.09)			(0.07)
L AGE	-0.10**	-0.08*	-0.05	-0.07**	-0.05	-0.04**
	(0.04)	(0.04)	(0.03)	(0.03)	(0.03)	(0.02)
L ASSETS	-0.32***	-0.28***	-0.10***	-0.30***	-0.26***	-0.05
	(0.05)	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)
ROA	-0.48	-0.35	-0.55*	-0.24	-0.10	-0.19
	(0.35)	(0.32)	(0.31)	(0.25)	(0.23)	(0.18)
EARNINGS VOL	2.06*	2.09*	0.64	1.98*	2.03*	0.66
	(1.10)	(1.08)	(0.53)	(1.04)	(1.03)	(0.48)
LEVERAGE	-0.07	-0.03	-0.47**	0.09	0.13	-0.29**
	(0.28)	(0.28)	(0.21)	(0.18)	(0.18)	(0.14)
TANGIBLES	-0.11	-0.08	0.08	-0.17**	-0.15**	-0.01
	(0.07)	(0.07)	(0.05)	(0.07)	(0.06)	(0.04)
ADVERTISING+R&D	-0.21	-0.23	-0.28	-0.11	-0.11	0.04
	(0.61)	(0.56)	(0.46)	(0.46)	(0.42)	(0.29)
INVESTMENTS	0.30	0.25	0.24*	0.12	0.07	0.13
	(0.19)	(0.19)	(0.13)	(0.19)	(0.19)	(0.11)
L INTEREST COV	-0.13***	-0.14***	-0.01	-0.15***	-0.17***	-0.04
	(0.05)	(0.04)	(0.04)	(0.04)	(0.04)	(0.03)
TIME TREND	0.01	0.01	0.00	0.02	0.01	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
RECESSION	0.20***	0.20***	0.16***	0.19**	0.20**	0.17***
	(0.07)	(0.07)	(0.06)	(0.08)	(0.08)	(0.06)
AFTER 1988	-0.47***	-0.44***	-0.24***	-0.44***	-0.41***	-0.23***
	(0.13)	(0.13)	(0.09)	(0.13)	(0.13)	(0.08)
BK MKT SHARE	-1.16*	-1.35**	-0.59	-1.26*	-1.43**	-0.61
	(0.67)	(0.67)	(0.48)	(0.64)	(0.64)	(0.41)
BK RELATIONSHIP	-0.06	-0.06	-0.02	-0.12	-0.13	-0.07
	(0.12)	(0.12)	(0.10)	(0.09)	(0.09)	(0.07)
L AMOUNT				0.20	0.17	-0.11
				(0.24)	(0.23)	(0.16)
L MATURITY				0.34***	0.34***	0.36***
				(0.05)	(0.05)	(0.03)
CONSTANT	1.21***	1.04**	1.36***	0.06	-0.11	0.16
Observations	1,314	1,314	1,283	1,309	1,309	1,278
Adjusted R-squared	0.47	0.49	0.69	0.55	0.56	0.77
P value for (1)+(2)=0			0.460			0.130

[a] Dependent variable is *GROSS SPREAD*, the underwriting spread of a debt issue measured as the difference between the offered amount and the proceeds to the issuer, expressed as a percentage of the offered amount (issue size); *IPO* is a dummy variable that takes the value 1 for the IPO bonds; *SECOND* is a dummy variable which takes the value 1 for the second public bond issued by debt IPO firms; *IGRADE* is a dummy variable which takes the value 1 for the investment-grade bonds. See definitions of firm controls in Table 1. *RECESSION* is a dummy variable which takes the value 1 if the bond was issued during a recession; *AFTER* 1988 is a dummy variable which takes the value one for the bonds issued in the period post 1988; *BK MKT SHARE* is the market share of the underwriter based on the volume of issues; *BK RELATIONSHIP* is a dummy variable which takes the value 1 if the bond IPO underwriter also acquired the firm's last private placement or extended the firm its last loan prior to its IPO bond); *L AMOUNT* is the log of the issue amount; *L MATURITY* is the log of the issue maturity. Robust standard errors clustered on company in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Source: Authors' computations.

Table 4. Gross spreads of IPO bonds: Firm-fixed effects regressions.[a]

Variables	(1)	(2)	(3)	(4)	(5)	(6)
IPO[(1)]	0.19**	0.31***	0.27***	0.17**	0.28***	0.20***
	(0.08)	(0.10)	(0.09)	(0.07)	(0.09)	(0.08)
SECOND		0.20***	0.16***		0.17***	0.12***
		(0.06)	(0.05)		(0.06)	(0.05)
IGRADE			-0.86***			-0.92***
			(0.08)			(0.08)
IPO x IGRADE[(2)]			-0.11			-0.08
			(0.10)			(0.09)
L AGE	0.08	0.13	-0.03	0.02	0.07	-0.11
	(0.14)	(0.14)	(0.11)	(0.12)	(0.12)	(0.09)
L ASSETS	-0.08	-0.07	-0.05	-0.07	-0.06	-0.04
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)
ROA	0.17	0.26	0.93	0.12	0.22	0.89
	(0.64)	(0.66)	(0.65)	(0.57)	(0.58)	(0.55)
EARNINGS VOL	-0.07	0.11	-0.02	0.11	0.27	0.12
	(0.38)	(0.42)	(0.41)	(0.38)	(0.42)	(0.37)
LEVERAGE	0.17	0.17	-0.04	0.20	0.20	-0.02
	(0.21)	(0.20)	(0.19)	(0.20)	(0.20)	(0.18)
TANGIBLES	-0.01	-0.02	0.04	-0.03	-0.04	0.01
	(0.17)	(0.16)	(0.10)	(0.17)	(0.16)	(0.10)
ADVERTISING+R&D	0.67	1.27	1.10	0.03	0.55	0.61
	(1.53)	(1.50)	(1.48)	(1.47)	(1.42)	(1.28)
INVESTMENTS	0.15	0.15	0.18	0.22	0.22	0.21
	(0.31)	(0.31)	(0.28)	(0.28)	(0.28)	(0.24)
L INTEREST COV	-0.08	-0.09	-0.07	-0.11*	-0.12**	-0.10**
	(0.06)	(0.06)	(0.05)	(0.06)	(0.06)	(0.05)
TIME TREND	-0.01	-0.01	0.00	-0.00	-0.00	0.01
	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)
RECESSION	0.13***	0.13***	0.08*	0.15***	0.15***	0.12**
	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)	(0.05)
AFTER 1988	-0.20	-0.20	-0.09	-0.20	-0.19	-0.10
	(0.12)	(0.12)	(0.11)	(0.12)	(0.12)	(0.11)
BK MKT SHARE	-0.65	-0.74*	-0.64**	-0.34	-0.42	-0.28
	(0.40)	(0.38)	(0.33)	(0.45)	(0.43)	(0.36)
L AMOUNT				0.07	0.08	-0.03
				(0.17)	(0.17)	(0.15)
L MATURITY				0.31***	0.30***	0.32***
				(0.04)	(0.04)	(0.03)
CONSTANT	0.12	-0.11	0.45	-0.71*	-0.91**	-0.28
Observations	1,191	1,191	1,169	1,186	1,186	1,164
R-squared	0.79	0.80	0.81	0.83	0.83	0.85
P value for (1)+(2)=0			0.064			0.120

[a] Dependent variable is $GROSS\ SPREAD$, the underwriting spread of a debt issue measured as the difference between the offered amount and the proceeds to the issuer, expressed as a percentage of the offered amount (issue size); IPO is a dummy variable that takes the value 1 for the IPO bonds; $SECOND$ is a dummy variable which takes the value 1 for the second public bond issued by debt IPO firms; $IGRADE$ is a dummy variable which takes the value 1 for the investment-grade bonds. See definitions of firm controls in Table 1. $RECESSION$ is a dummy variable which takes the value 1 if the bond was issued during a recession; $AFTER$ 1988 is a dummy variable which takes the value one for the bonds issued in the period post 1988; $BK\ MKT\ SHARE$ is the market share of the underwriter based on the volume of issues; $L\ AMOUNT$ is the log of the issue amount; $L\ MATURITY$ is the log of the issue maturity. Robust standard errors clustered on company in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Source: Authors' computations.

Table 5. Ex-ante yield spreads of IPO bonds: Pooled regressions.[a]

Variables	(1)	(2)	(3)	(4)	(5)	(6)
IPO[(1)]	0.86***	1.06***	0.64***	0.36***	0.43***	0.47***
	(0.13)	(0.14)	(0.17)	(0.12)	(0.13)	(0.17)
SECOND		0.52***	0.27***		0.14	0.15*
		(0.13)	(0.09)		(0.10)	(0.09)
IGRADE			-2.23***			-1.82***
			(0.15)			(0.15)
IPO x IGRADE[(2)]			-0.60***			-0.50***
			(0.20)			(0.18)
L AGE	-0.24***	-0.21***	-0.10**	-0.15***	-0.14***	-0.07
	(0.07)	(0.07)	(0.05)	(0.05)	(0.06)	(0.05)
L ASSETS	-0.44***	-0.39***	-0.17***	-0.46***	-0.45***	-0.26***
	(0.07)	(0.07)	(0.04)	(0.05)	(0.05)	(0.04)
ROA	-2.04***	-1.75***	-1.33***	-2.02***	-1.94***	-1.46***
	(0.60)	(0.66)	(0.42)	(0.53)	(0.55)	(0.39)
EARNINGS VOL	5.87**	5.92**	1.93	2.94*	2.99*	1.30
	(2.90)	(2.88)	(1.43)	(1.60)	(1.62)	(1.07)
LEVERAGE	0.63**	0.70**	-0.03	0.53***	0.55***	0.05
	(0.31)	(0.31)	(0.20)	(0.21)	(0.21)	(0.19)
TANGIBLES	-0.54***	-0.50***	-0.08	-0.22**	-0.21**	-0.01
	(0.15)	(0.14)	(0.09)	(0.11)	(0.11)	(0.09)
ADVERTISING+R&D	1.27	1.31	1.88***	0.89	0.90	1.57**
	(0.99)	(1.01)	(0.67)	(0.80)	(0.81)	(0.62)
INVESTMENTS	0.90**	0.80*	0.14	0.18	0.16	-0.08
	(0.42)	(0.41)	(0.28)	(0.33)	(0.33)	(0.27)
L INTEREST COV	-0.24***	-0.28***	-0.08	-0.15**	-0.16**	-0.07
	(0.07)	(0.07)	(0.06)	(0.07)	(0.07)	(0.06)
RECESSION	0.28**	0.31***	0.32***	0.34***	0.35***	0.33***
	(0.11)	(0.11)	(0.08)	(0.09)	(0.09)	(0.08)
TREASURY SLOPE	-0.05	-0.05	-0.14**	-0.18**	-0.17**	-0.17***
	(0.09)	(0.08)	(0.07)	(0.07)	(0.07)	(0.06)
AAA YIELD	-0.18***	-0.18***	-0.19***	-0.32***	-0.32***	-0.24***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
BBB-AAA SPREAD	0.94***	0.92***	0.86***	0.58***	0.58***	0.70***
	(0.19)	(0.18)	(0.14)	(0.16)	(0.16)	(0.14)
BK MKT SHARE	-0.49	-0.77	-0.52	-0.18	-0.26	-0.69
	(0.95)	(0.94)	(0.66)	(0.76)	(0.75)	(0.60)
BK RELATIONSHIP	-0.02	-0.02	0.11	0.08	0.08	0.12
	(0.15)	(0.14)	(0.10)	(0.13)	(0.13)	(0.09)
L AMOUNT				1.44***	1.42***	0.84***
				(0.19)	(0.19)	(0.16)
L MATURITY				-0.25***	-0.25***	-0.10**
				(0.07)	(0.07)	(0.05)
CALLABLE				1.19***	1.17***	0.41***
				(0.12)	(0.12)	(0.11)
SINKING FUND				0.62***	0.62***	0.34**
				(0.20)	(0.20)	(0.17)
SHELF				-0.39***	-0.38***	-0.15
				(0.11)	(0.11)	(0.10)
PUT OPTION				-0.87***	-0.86***	-0.59***
				(0.13)	(0.13)	(0.10)
CONSTANT	3.66***	3.47***	4.99***	4.96***	4.88***	5.27***
Observations	1,453	1,453	1,425	1,453	1,453	1,425
Adjusted R-squared	0.47	0.49	0.71	0.63	0.63	0.73
P value for (1)+(2)=0			0.657			0.761

[a] Dependant variable is $GREDIT\ SPREAD$, the ex-ante credit spread over Treasury with the same maturity of the bond; IPO is a dummy variable that takes the value 1 for the IPO bonds; $SECOND$ is a dummy variable which takes the value 1 for the second public bond issued by debt IPO firms; $IGRADE$ is a dummy

variable which takes the value 1 for the investment-grade bonds. See definitions of firm controls in Table 1. $RECESSION$ is a dummy variable which takes the value 1 if the bond was issued during a recession; $TREASURY\ SLOPE$ is the difference between the yields of Treasuries with 30 year and 5 year maturity; $AAA\ YIELD$ is the Moody's index on the yield of triple-A rated bonds; $BBB-AAA\ SPREAD$ is the difference between the Moody's indeces on the yields of triple-A and triple-B rated bonds; $BK\ MKT\ SHARE$ is the market share of the underwriter based on the volume of issues; $BK\ RELATIONSHIP$ is a dummy variable which takes the value 1 if the bond IPO underwriter also acquired the firm's last private placement or extended the firm its last loan prior to its IPO bond); $L\ AMOUNT$ is the log of the issue amount; $L\ MATURITY$ is the log of the issue maturity; $CALLABLE$ is a dummy variable which takes the value 1 for callable bonds; $SINKING\ FUND$ is a dummy variable which takes the value 1 for bonds with a sinking fund; $SHELF$ is a dummy variable which takes the value 1 for shelf bonds; $PUT\ OPTION$ is a dummy variable which takes the value 1 for bonds with a put option. Robust standard errors clustered on company in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Source: Authors' computations.

Table 6. Ex-ante credit spreads of IPO bonds: Fixed effects regressions.[a]

Variables	Regressions					
	(1)	(2)	(3)	(4)	(5)	(6)
IPO[(1)]	0.52***	0.59***	0.69**	0.37**	0.34*	0.47*
	(0.19)	(0.21)	(0.30)	(0.16)	(0.18)	(0.28)
SECOND		0.12	0.04		-0.04	-0.08
		(0.12)	(0.11)		(0.11)	(0.11)
IGRADE			-1.58***			-1.32***
			(0.26)			(0.24)
IPO x IGRADE[(2)]			-0.53			-0.44
			(0.33)			(0.31)
L AGE	0.22	0.26	0.11	0.33**	0.32**	0.18
	(0.16)	(0.17)	(0.15)	(0.14)	(0.15)	(0.13)
L ASSETS	0.06	0.06	0.14	-0.00	-0.00	0.08
	(0.10)	(0.10)	(0.11)	(0.09)	(0.09)	(0.10)
ROA	-1.80	-1.73	-0.26	-1.78	-1.81	-0.61
	(1.22)	(1.22)	(1.24)	(1.15)	(1.16)	(1.25)
EARNINGS VOL	-1.67**	-1.55*	-1.83*	-0.97	-1.01	-1.34
	(0.84)	(0.89)	(1.06)	(0.91)	(0.90)	(1.04)
LEVERAGE	0.91	0.92	0.60	0.53	0.52	0.38
	(0.70)	(0.70)	(0.55)	(0.70)	(0.70)	(0.58)
TANGIBLES	-0.59	-0.60	-0.45	-0.61*	-0.60*	-0.50*
	(0.38)	(0.38)	(0.30)	(0.32)	(0.32)	(0.26)
ADVERTISING+R&D	-1.77	-1.39	0.42	-4.00	-4.14	-1.93
	(3.50)	(3.62)	(3.62)	(3.11)	(3.17)	(3.30)
INVESTMENTS	0.07	0.09	0.30	0.24	0.23	0.43
	(0.67)	(0.68)	(0.63)	(0.59)	(0.59)	(0.56)
L INTEREST COV	-0.08	-0.09	-0.06	-0.08	-0.08	-0.05
	(0.13)	(0.13)	(0.10)	(0.11)	(0.12)	(0.10)
RECESSION	0.33***	0.33***	0.31***	0.39***	0.39***	0.35***
	(0.10)	(0.10)	(0.08)	(0.10)	(0.10)	(0.08)
TREASURY SLOPE	-0.03	-0.03	-0.03	-0.08	-0.08	-0.07
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
AAA YIELD	-0.06	-0.06	-0.08	-0.13**	-0.13**	-0.12**
	(0.05)	(0.05)	(0.06)	(0.05)	(0.05)	(0.06)
BBB-AAA SPREAD	0.80***	0.79***	0.71***	0.60***	0.60***	0.55***
	(0.19)	(0.19)	(0.16)	(0.18)	(0.18)	(0.17)
BK MKT SHARE	-1.11*	-1.16*	-1.09*	-0.85	-0.83	-0.83
	(0.66)	(0.67)	(0.60)	(0.62)	(0.62)	(0.58)
L AMOUNT				0.54**	0.53**	0.37
				(0.24)	(0.24)	(0.24)
L MATURITY				0.01	0.01	0.05
				(0.05)	(0.05)	(0.04)
CALLABLE				0.61***	0.61***	0.44***
				(0.12)	(0.12)	(0.10)
SINKING FUND				0.55	0.55	0.44
				(0.35)	(0.35)	(0.31)
SHELF				-0.17	-0.18	-0.10
				(0.11)	(0.11)	(0.09)
PUT OPTION				-0.70***	-0.71***	-0.68***
				(0.12)	(0.12)	(0.12)
CONSTANT	1.05	0.93	2.33**	1.49*	1.54*	2.37***
Observations	1,328	1,328	1,308	1,328	1,328	1,308
R-squared	0.84	0.84	0.87	0.87	0.87	0.88
P value for (1)+(2)=0			0.327			0.833

[a] Dependant variable is $GREDIT\ SPREAD$, the ex-ante credit spread over Treasury with the same maturity of the bond; IPO is a dummy variable that takes the value 1 for the IPO bonds; $SECOND$ is a dummy variable which takes the value 1 for the second public bond issued by debt IPO firms; $IGRADE$ is a dummy variable which takes the value 1 for the investment-grade bonds. See definitions of firm controls in Table

1. $RECESSION$ is a dummy variable which takes the value 1 if the bond was issued during a recession; $TREASURY\ SLOPE$ is the difference between the yields of Treasuries with 30 year and 5 year maturity; $AAA\ YIELD$ is the Moody's index on the yield of triple-A rated bonds; $BBB - AAA\ SPREAD$ is the difference between the Moody's indeces on the yields of triple-A and triple-B rated bonds; $BK\ MKT\ SHARE$ is the market share of the underwriter based on the volume of issues; $L\ AMOUNT$ is the log of the issue amount; $L\ MATURITY$ is the log of the issue maturity; $CALLABLE$ is a dummy variable which takes the value 1 for callable bonds; $SINKING\ FUND$ is a dummy variable which takes the value 1 for bonds with a sinking fund; $SHELF$ is a dummy variable which takes the value 1 for shelf bonds; $PUT\ OPTION$ is a dummy variable which takes the value 1 for bonds with a put option. Robust standard errors clustered on company in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Source: Authors' computations.

Table 7. Difference betweem ex-ante yields and market yields at the time of the first trade.[a]

Variables	Regressions					
	(1)	(2)	(3)	(4)	(5)	(6)
IPO[(1)]	0.10	0.13*	0.26*	0.11*	0.15**	0.28*
	(0.07)	(0.07)	(0.15)	(0.06)	(0.06)	(0.16)
SECOND		0.07	0.10		0.10	0.12
		(0.07)	(0.07)		(0.09)	(0.09)
IGRADE			0.10			0.06
			(0.07)			(0.07)
IPO x IGRADE[(2)]			-0.23			-0.20
			(0.18)			(0.18)
L AGE	-0.03	-0.02	-0.03	-0.02	-0.02	-0.02
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
L ASSETS	-0.02	-0.02	-0.01	0.01	0.02	0.02
	(0.03)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)
ROA	0.05	0.07	-0.03	-0.02	0.01	-0.02
	(0.38)	(0.38)	(0.38)	(0.36)	(0.35)	(0.35)
EARNINGS VOL	0.21	0.17	0.42	0.38	0.43	0.58
	(0.63)	(0.63)	(0.73)	(0.69)	(0.69)	(0.74)
LEVERAGE	0.01	0.01	0.04	0.10	0.12	0.12
	(0.10)	(0.09)	(0.10)	(0.12)	(0.12)	(0.13)
TANGIBLES	0.02	0.03	0.04	0.01	0.02	0.02
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
ADVERTISING+R&D	0.41	0.36	0.49	0.75	0.69	0.67
	(1.15)	(1.18)	(1.15)	(1.17)	(1.21)	(1.18)
INVESTMENTS	0.09	0.08	0.10	0.12	0.11	0.11
	(0.13)	(0.13)	(0.12)	(0.12)	(0.12)	(0.12)
L INTEREST COV	-0.01	-0.02	-0.02	-0.00	-0.01	-0.01
	(0.03)	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)
RECESSION	-0.08	-0.08	-0.09	-0.07	-0.07	-0.07
	(0.19)	(0.19)	(0.19)	(0.18)	(0.18)	(0.19)
TREASURY SLOPE	-0.10	-0.10	-0.10	-0.14	-0.14	-0.14
	(0.11)	(0.11)	(0.11)	(0.11)	(0.11)	(0.12)
BBB-AAA SPREAD	0.22	0.22	0.24	0.29*	0.29*	0.29*
	(0.15)	(0.15)	(0.15)	(0.16)	(0.15)	(0.15)
BK MKT SHARE	-1.15**	-1.18**	-1.13**	-0.91*	-0.97*	-1.02*
	(0.55)	(0.53)	(0.54)	(0.53)	(0.51)	(0.54)
BK RELATIONSHIP	-0.08	-0.08	-0.07	-0.07	-0.07	-0.07
	(0.07)	(0.07)	(0.07)	(0.06)	(0.05)	(0.06)
L AMOUNT				-0.15	-0.16	-0.16
				(0.09)	(0.10)	(0.10)
L MATURITY				0.15**	0.16**	0.15**
				(0.06)	(0.06)	(0.06)
CALLABLE				0.05	0.04	0.01
				(0.05)	(0.06)	(0.07)
SINKING FUND				1.03***	1.06***	0.00
				(0.10)	(0.11)	(0.00)
SHELF				0.01	0.03	0.03
				(0.06)	(0.06)	(0.06)
PUT OPTION				-0.16	-0.15	-0.14
				(0.10)	(0.10)	(0.10)
CONSTANT	0.09	0.05	-0.00	-0.45	-0.51	-0.49
Observations	359	359	357	358	358	356
Adjusted R-squared	0.00	0.00	0.01	0.05	0.06	0.04
P value for (1)+(2)=0			0.643			0.262

[a] Dependant variable is *ABN SPREAD*, the percentage point difference between the ex-ante yield spread and the secondary market yields spread when the bond first trades provided this occurs within one moth from the issuance date, where these spreads are computed over the Moody's daily bond yield index with the same rating of the bond; *IPO* is a dummy variable that takes the value 1 for the IPO bonds; *SECOND* is a dummy variable which takes the value 1 for the second public bond issued by debt IPO firms; *IGRADE* is a dummy variable which takes the value 1 for the investment-grade bonds. See definitions of firm controls

in Table 1. $RECESSION$ is a dummy variable which takes the value 1 if the bond was issued during a recession; $TREASURY\ SLOPE$ is the difference between the yields of Treasuries with 30 year and 5 year maturity; $BBB - AAA\ SPREAD$ is the difference between the Moody's indeces on the yields of triple-A and triple-B rated bonds; $BK\ MKT\ SHARE$ is the market share of the underwriter based on the volume of issues; $BK\ RELATIONSHIP$ is a dummy variable which takes the value 1 if the bond IPO underwriter also acquired the firm's last private placement or extended the firm its last loan prior to its IPO bond); $L\ AMOUNT$ is the log of the issue amount; $L\ MATURITY$ is the log of the issue maturity; $CALLABLE$ is a dummy variable which takes the value 1 for callable bonds; $SINKING\ FUND$ is a dummy variable which takes the value 1 for bonds with a sinking fund; $SHELF$ is a dummy variable which takes the value 1 for shelf bonds; $PUT\ OPTION$ is a dummy variable which takes the value 1 for bonds with a put option. Robust standard errors clustered on company in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Source: Authors' computations.

Table 8. Sources of the benefits from entering the public bond market[a]

Private bonds						
Gross spreads						
	Last before vs. first after			Last before vs All after		
	Last spread	Fst spread	Diff	Last spread	All spread	Diff
	(Obs)	(Obs)	(T-stat)	(Obs)	(Obs)	(T-Stat)
ALL IPOS	2.412	1.842	0.571**	2.412	1.959	0.453**
	(94)	(35)	(2.831)	(94)	(56)	(2.915)
IGRAGE IPOS	2.263	1.233	1.029**	2.263	1.337	0.925**
	(144)	(9)	(2.976)	(144)	(14)	(3.531)
BGRAGE IPOS	2.202	2.037	0.165	2.202	2.162	0.040
	(131)	(20)	(0.714)	(131)	(34)	(0.243)
Ex ante credit spreads over Treasury						
	Last before vs. first after			Last before vs All after		
	Last spread	Fst spread	Diff	Last spread	All spread	Diff
	(Obs)	(Obs)	(T-stat)	(Obs)	(Obs)	(T-Stat)
ALL IPOS	4.294	3.854	0.440**	4.294	3.885	0.409**
	(322)	(155)	(2.392)	(322)	(208)	(2.491)
IGRAGE IPOS	4.315	2.433	1.883***	4.315	2.550	1.766***
	(633)	(24)	(5.640)	(633)	(38)	(6.017)
BGRAGE IPOS	4.265	4.062	0.202	4.265	4.189	0.076
	(538)	(107)	(1.081)	(538)	(140)	(0.485)
Loans						
Spreads over Libor						
	Last before vs. first after			Last before vs All after		
	Last spread	Fst spread	Diff	Last spread	All spread	Diff
	(Obs)	(Obs)	(T-stat)	(Obs)	(Obs)	(T-Stat)
ALL IPOS	207.88	154.14	53.74***	207.88	167.70	40.18***
	(2872)	(446)	(9.654)	(2872)	(568)	(8.343)
IGRAGE IPOS	210.93	72.84	138.09***	210.93	93.17	117.76***
	(3092)	(102)	(17.733)	(3092)	(127)	(14.403)
BGRAGE IPOS	207.13	197.87	9.26	207.13	207.32	-0.184
	(3016)	(219)	(1.342)	(3016)	(284)	(0.0324)

[a] *IGRADE IPOS* IPO bonds rated investment grade by Moody's. *BGRADE IPOS* IPO bonds rated below grade by Moody's.

Source: Authors' computations.

Table 9. Loans spreads: Pooled regressions.[a]

Variables	Regressions					
	(1)	(2)	(3)	(4)	(5)	(6)
AFTER IPO	5.90			-1.29		
	(6.91)			(5.80)		
AFTER IGRADE IPO		-47.67***	- 43.90***		-36.46***	-35.22***
		(10.85)	(13.53)		(9.04)	(10.91)
AFTER BGRADE IPO		22.26***	15.17*		13.17**	11.87
		(7.24)	(8.67)		(6.40)	(7.56)
AFTER NR IPO		25.81*	26.72		3.31	17.71
		(14.27)	(22.20)		(11.10)	(19.47)
L AGE	-5.89**	-6.47**	-5.87**	-3.74	-4.16*	-3.27
	(2.58)	(2.58)	(2.69)	(2.40)	(2.40)	(2.49)
L ASSETS	-23.58***	-22.31***	-22.14***	-18.33***	-17.77***	-18.34***
	(1.47)	(1.46)	(1.50)	(1.66)	(1.65)	(1.74)
ROA	-73.02***	-69.77***	-68.18***	-69.00***	-67.19***	-64.77***
	(17.20)	(17.60)	(17.06)	(17.01)	(17.52)	(17.36)
EARNINGS VOL	-0.63	-0.57	-0.64	-0.12	-0.11	-0.20
	(0.67)	(0.65)	(0.61)	(0.68)	(0.67)	(0.63)
LEVERAGE	89.68***	82.83***	81.93***	60.92***	56.12***	55.33***
	(10.95)	(10.71)	(11.18)	(9.77)	(9.66)	(10.15)
TANGIBLES	- 23.18***	-21.45***	-21.98***	-18.42***	-17.50***	-18.58***
	(5.21)	(5.01)	(5.16)	(4.54)	(4.46)	(4.66)
ADVERTISING+R&D	-1.36**	-1.30**	-1.26**	- 1.16**	-1.12**	-1.08**
	(0.58)	(0.59)	(0.59)	(0.50)	(0.51)	(0.51)
INVESTMENTS	23.31**	15.48	15.03	3.55	-0.87	-0.21
	(10.66)	(10.64)	(10.73)	(9.87)	(9.94)	(10.01)
L INTEREST COV	-12.04***	-11.90***	-11.43***	-10.71***	- 10.70***	-10.51***
	(1.90)	(1.90)	(1.92)	(1.73)	(1.74)	(1.76)
TIME TREND	8.78***	8.97***	9.22***	7.26***	7.46***	7.65***
	(0.77)	(0.76)	(0.79)	(0.77)	(0.77)	(0.80)
RECESSION	10.06**	10.48**	11.53**	15.86***	15.96***	17.44***
	(4.85)	(4.75)	(5.01)	(4.37)	(4.32)	(4.57)
TREASURY SLOPE	-2.86	-2.68	-3.29	-3.24	-2.99	-4.19
	(3.53)	(3.38)	(3.58)	(3.38)	(3.30)	(3.46)
AAA YIELD	9.49***	9.92***	10.10***	9.42***	9.66***	8.91***
	(3.11)	(3.01)	(3.13)	(2.88)	(2.83)	(2.97)
BBB-AAA SPREAD	-44.26***	-45.65***	-46.82***	-28.51***	-29.48***	-30.38***
	(8.27)	(8.11)	(8.58)	(7.85)	(7.80)	(8.14)
LRELATIONSHIP	-3.18	-3.43	-3.76	-2.20	-2.26	-3.84
	(2.97)	(2.93)	(3.10)	(2.78)	(2.75)	(2.95)
L AMOUNT				-5.29**	-4.89**	-4.05*
				(2.07)	(2.08)	(2.21)
L MATURITY				6.25**	5.54**	5.51*
				(2.75)	(2.71)	(2.84)
SECURED				40.80***	39.68***	38.53***
				(5.38)	(5.24)	(5.38)
SENIOR				- 8.63	-6.87	-7.98
				(5.80)	(5.67)	(6.09)
CORPORATE PURP				-18.48***	-18.81***	-19.12***
				(4.79)	(4.68)	(4.95)
REFINANCE				-16.36***	-17.27***	-17.14***
				(4.08)	(4.06)	(4.30)
TAKEOVER				0.95	0.22	-1.32
				(4.88)	(4.82)	(5.13)
WORKING CAP				-23.10***	-23.77***	-24.20***
				(4.98)	(4.96)	(5.09)

[a] Continues on the next page.

Table 9. Continued. [a]

Variables	Regressions					
	(1)	(2)	(3)	(4)	(5)	(6)
TERM LOAN				26.56***	26.36***	25.13***
				(5.79)	(5.83)	(5.99)
CREDIT LINE				-15.98***	-15.45***	-14.83***
				(5.50)	(5.52)	(5.67)
BRIDGE LOAN				74.15***	72.59***	72.39***
				(20.72)	(20.74)	(23.20)
GUARANTOR				-7.29	-7.64	-6.06
				(7.36)	(7.37)	(7.86)
SPONSOR				55.19***	53.56***	58.47***
				(5.55)	(5.45)	(5.76)
RENEWAL				7.45	7.15	5.74
				(10.16)	(10.05)	(10.15)
DIVIDEND REST				14.37***	12.98***	12.49***
				(3.13)	(3.13)	(3.27)
SYNDICATED				-2.47	-2.69	-4.03
				(4.28)	(4.28)	(4.34)
CONSTANT	-35.45	-34.04	-39.31	78.30**	73.75**	67.44*
Observations	8973	8973	8211	8391	8391	7679
Adjusted R-squared	0.29	0.31	0.29	0.42	0.42	0.41

[a] Dependant variable is $LOAN\ SPREAD$, the loan spread at origination over Libor; $AFTER\ IPO$ is a dummy variable that takes the value 1 for the loans taken out after the firm's bond IPO; $AFTER\ IGRADE\ IPO$ is a dummy variable that takes the value 1 for the loans taken out after the firm's bond IPO that are rated investment grade; $AFTER\ BGRADE\ IPO$ is a dummy variable that takes the value 1 for the loans taken out after the firm's bond IPO that are rated below grade; $AFTER\ NR\ IPO$ is a dummy variable that takes the value 1 for the loans taken out after the firm's bond IPO for which the rating on the first public the firm issues is missing. See definitions of firm controls in Table 1. $RECESSION$ is a dummy variable which takes the value 1 if the bond was issued during a recession; $TREASURY\ SLOPE$ is the difference between the yields of Treasuries with 30 year and 5 year maturity; $AAA\ YIELD$ is the Moody's index on the yield of triple-A rated bonds; $BBB - AAA\ SPREAD$ is the difference between the Moody's indeces on the yields of triple-A and triple-B rated bonds; $LRELATIONSHIP$ is a dummy variable which takes the value 1 if the firm borrowed from the lead underwriter(s) in the loan syndicate at least once in the year prior to the loan; $L\ AMOUNT$ is the log of loan amount in 1980 dollars; $L\ MATURITY$ is the log of loan maturity in years; $SECURED$ is a dummy variable that takes the value 1 if the loan is secured; $SENIOR$ is a dummy variable that takes the value 1 if the loan is senior; $CORPORATE\ PURP$ is a dummy variable that takes the value 1 if the loan is for corporate purposes; $REFINANCE$ is a dummy variable that takes the value 1 if the loan is to repay existing debt; $TAKEOVER$ is a dummy variable that takes the value 1 if the loan is to finance a takeover; $WORKING\ CAP$ is a dummy variable that takes the value 1 if the loan is for working capital; $TERM\ LOAN$ is a dummy variable that takes the value 1 for term loans; $CREDIT\ LINE$ is a dummy variable that takes the value 1 for credit lines; $BRIDGE\ LOAN$ is a dummy variable that takes the value 1 for bridge loans; $GUARANTOR$ is a dummy variable that takes the value 1 if the borrower has a guarantor; $SPONSOR$ is a dummy variable that takes the value 1 if the borrower has a sponsor; $RENEWAL$ is a dummy variable indicating if the loan is a renewal of an existing loan;. $DIVIDEND\ REST$ is a dummy variable that takes the value 1 if the borrower faces dividend restrictions in connection with that loan; $SYNDICATED$ is a dummy variable that equals one if the loan is syndicated. Robust standard errors clustered on company in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Source: Authors' computations.

Table 10. Loans spreads: Fixed effects regressions.[a]

Variables	Regressions					
	(1)	(2)	(3)	(4)	(5)	(6)
AFTER IPO	- 11.95			-12.48		
	(10.06)			(9.22)		
AFTER IGRADE IPO		-24.35**	-35.67***		-20.88*	-32.80***
		(11.97)	(11.95)		(12.38)	(12.58)
AFTER BGRADE IPO		-20.24	-20.94		-19.68	-20.11
		(14.33)	(16.78)		(12.95)	(14.67)
AFTER NR IPO		22.24	45.96**		10.94	26.95
		(18.80)	(21.49)		(18.96)	(24.10)
L AGE	15.87	15.75	12.77	15.22	15.23	10.08
	(10.64)	(10.66)	(11.44)	(10.28)	(10.30)	(11.05)
L ASSETS	-8.04*	-7.98*	-8.15*	-4.96	-4.96	-4.41
	(4.52)	(4.49)	(4.95)	(4.48)	(4.48)	(5.01)
ROA	-58.39**	-58.29**	-64.31**	-44.34*	-44.23*	-50.53*
	(26.20)	(26.09)	(28.26)	(24.91)	(24.82)	(26.92)
EARNINGS VOL	2.48	2.48	2.48	2.31	2.32	2.27
	(2.94)	(2.95)	(2.94)	(3.36)	(3.36)	(3.34)
LEVERAGE	10.01	10.45	9.63	22.03	22.47	20.92
	(15.82)	(15.79)	(16.91)	(15.28)	(15.29)	(16.21)
TANGIBLES	-23.00**	-22.20*	-17.74	-20.06*	- 19.51*	-14.11
	(11.53)	(11.39)	(12.04)	(11.12)	(11.06)	(11.46)
ADVERTISING+R&D	-1.02***	-1.02***	-1.03***	-0.58***	-0.58***	-0.54***
	(0.08)	(0.08)	(0.08)	(0.16)	(0.16)	(0.17)
INVESTMENTS	4.89	4.75	2.98	0.32	0.27	-1.51
	(17.82)	(17.95)	(19.21)	(16.89)	(16.96)	(18.01)
L INTEREST COV	-7.10***	-7.06***	-5.61**	-7.77***	-7.74***	-6.06**
	(2.70)	(2.69)	(2.84)	(2.65)	(2.64)	(2.67)
TIME TREND	6.59***	6.67***	7.35***	5.60***	5.67***	6.67***
	(1.61)	(1.62)	(1.68)	(1.59)	(1.59)	(1.67)
RECESSION	16.89***	16.49***	19.12***	18.60***	18.26***	20.66***
	(5.28)	(5.32)	(5.89)	(5.16)	(5.18)	(5.74)
TREASURY SLOPE	- 0.16	0.10	-0.40	-1.84	-1.66	-2.68
	(3.48)	(3.48)	(3.74)	(3.52)	(3.52)	(3.76)
AAA YIELD	8.26***	8.49***	8.30***	6.23**	6.39**	5.47*
	(3.00)	(2.99)	(3.20)	(3.05)	(3.05)	(3.28)
BBB-AAA SPREAD	-42.82***	-42.91***	-43.49***	-32.32***	-32.49***	-33.58***
	(8.60)	(8.59)	(9.38)	(8.49)	(8.50)	(9.21)
LRELATIONSHIP	-6.87**	-7.00**	-5.02	-5.72*	-5.79**	-4.64
	(2.93)	(2.93)	(3.11)	(2.95)	(2.95)	(3.01)
CONSTANT	-4.72	-7.70	-10.93	89.66*	86.56*	91.23*
LOAN CONTROLS	NO	NO	NO	YES	YES	YES
Observations	9285	9285	8262	8692	8692	7728
R-squared	0.76	0.76	0.76	0.80	0.80	0.80

[a] Dependant variable is $LOAN\ SPREAD$, the loan spread at origination over Libor; $AFTER\ IPO$ is a dummy variable that takes the value 1 for the loans taken out after the firm's bond IPO; $AFTER\ IGRADE\ IPO$ is a dummy variable that takes the value 1 for the loans taken out after the firm's bond IPO that are rated investment grade; $AFTER\ BGRADE\ IPO$ is a dummy variable that takes the value 1 for the loans taken out after the firm's bond IPO that are rated below grade; $AFTER\ NR\ IPO$ is a dummy variable that takes the value 1 for the loans taken out after the firm's bond IPO for which the rating on the first public the firm issues is missing. See definitions of firm controls in Table 1. $RECESSION$ is a dummy variable which takes the value 1 if the bond was issued during a recession; $TREASURY\ SLOPE$ is the difference between the yields of Treasuries with 30 year and 5 year maturity; $AAA\ YIELD$ is the Moody's index on the yield of triple-A rated bonds; $BBB - AAA\ SPREAD$ is the difference between the Moody's indeces on the yields of triple-A and triple-B rated bonds; $LRELATIONSHIP$ is a dummy variable which takes the value 1 if the bond IPO

underwriter also acquired the firm's last private placement or extended the firm its last loan prior to its IPO bond); *LOAN CONTROLS* is the same set of loan controls used in Table 9. Robust standard errors clustered on company in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

Source: Authors' computations.