

Shareholders as Creditors of First Resort*

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Abstract

We study firms' decisions to enter public bond markets for the first time (bond IPOs). We show that firm's ability to access public bond market is greatly improved by the presence of "habitual dual holders" (HDHs) – financial conglomerates which have the tendency to simultaneously hold both equity and bonds of their portfolio firms – among its shareholders. HDHs are more likely to buy bonds in the IPO and take larger bond positions than bond investors without equity stake in the firm. Larger equity ownership by HDHs is associated with larger part of the issue ending up in the hands of pre-IPO shareholders, lower offering yield spreads, and more bond covenants. Our results suggest that information transfer within institutional shareholders reduces the segmentation between debt and equity markets and facilitates firms' access to new sources of financing.

JEL Classification: G14, G23, G32

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1. Introduction

Two stylized facts stand out in the capital structure literature. First, over 14% of large public non-financial U.S. firms have zero debt (Strebulaev and Yang, 2013). Second, the vast majority of firms with positive leverage specialize in one type of debt (Colla, Ippolito, and Li, 2013). These facts indicate segmentation between equity and debt markets as well as segmentation between types of debt markets (e.g., Kapadia and Pu, 2012).

Segmentation between different asset markets is in part the outcome of narrow investment mandates (He and Xiong, 2013). As investors spend time and resources to specialize in particular securities, they give up the ability to undertake investments outside of their area of expertise (Lukas, 1978, Hochberg and Westerfield, 2011). Because of investment specialization, investors follow only firms which already issued a particular class of securities. Hence, the information about, for example, zero leverage firms used by equity investors may not be readily utilized by fixed income investors. Moreover, the cost of transmitting information to investors so that they will use it efficiently can be considerable (Merton, 1987). The information asymmetry gap between asset markets lowers the supply of capital, impeding the firm's ability to issue new types of securities, and leads to under-diversification of sources of financing and suboptimal capital structure.

In this paper we study firms' decisions to enter public bond markets for the first time – bond IPOs. We argue that the firm's ability to tap into the new source of financing is greatly improved by the presence of “habitual dual holders” (HDHs) – financial conglomerates which have the tendency to simultaneously hold both equity and bonds of their portfolio firms – among its shareholders. A number of recent studies provide evidence on information sharing within financial conglomerates (Acharya and Johnson, 2007; Ritter and Zhang, 2007; Massa and Rehman, 2008; Bodnaruk, Massa, and Simonov, 2009; Ivashina and Sun, 2011, Bodnaruk and Rossi, 2016). So if the equity division of a group is already familiar with the firm and recommends it to its fixed income affiliate, the latter should be more willing to buy firm's bonds and also offer better financing terms. In essence, information sharing within “habitual

dual holders” partially overcomes market segmentation for their portfolio firms. Consequently, the dual holding propensity of existing shareholders should be a key determinant of the firm’s decision to do a bond IPO.

There are several considerations which make bond IPOs a fruitful environment for studying the impact of market segmentation on firm’s financing decisions. First, the cost of bridging information asymmetry gap is likely to be large prior to the firm issuing a given type of securities for the first time (as opposed to seasoned issues). Though the firm may have a long track record with equity investors, it lacks history of coupon payments, covenant violations, renegotiations etc. Second, the benefits of accessing public bond markets accrue over a long time. For example, firms are able to borrow at lower rates from the banks after completing bond IPO (Hale and Santos, 2009). Third, wide dissemination of bonds in public offerings mitigates concerns that the observed findings could be driven, for example, by prior bank-borrower relationships.¹

Our analysis covers the period between 2000 and 2013. To identify shareholders which are likely to buy bonds in bond IPOs – i.e., to become company dual holders – we examine financial conglomerates’ quarterly holdings of equity (Spectrum 13f) and bonds (Lipper eMAXX) in publicly listed firms which already issued publicly traded bonds. We calculate conglomerate’s dual holding propensity (DHP) as the ratio of the value of equity in dual holding positions (i.e., simultaneous ownership of equity and bonds) and the value of equity invested in firms with public bonds outstanding.² DHP measures how likely the conglomerate is to hold both equity and bonds in the publicly listed firm when both equity and bonds of the firm are publicly traded.

In a sample of 388 bond IPOs, we show that conglomerates with higher dual holding propensity are more likely to buy bonds at the IPO and buy them in larger quantities. This, however, is true only when

¹ Indeed, Cai, Helwege, and Warga (2007) do not find evidence that prior banking relationship affect bond IPO underpricing.

² The following example illustrates how the dual holding propensity (DHP) is constructed. Let conglomerate’s total investment in equity be 1 billion with 600 million invested in companies with public bonds and the rest in companies without public bonds. If 150 million (out of 600) is invested firms in which the conglomerate also has bond positions, then the DHP would equal to $150/600 = 0.25$.

the conglomerate is a pre-IPO shareholder. Furthermore, the demand for the newly issued bonds is increasing in the conglomerate's equity stake. For a conglomerate with the DHP at the 75% percentile of its distribution (approximately 0.1650), a one standard deviation larger equity ownership is associated with 8.23% higher likelihood of holding bonds right after the IPO and 68.63% larger size of the bond position.³ In contrast, a one standard deviation larger equity ownership for a conglomerate at the 25% percentile of DHP distribution (0.0000) is related to only 5.85% larger likelihood of becoming a bondholder and 56.01% larger bond position. The fact that dual holding propensity of a conglomerate has an effect on its participation in the bond IPO only in conjunction with prior equity position suggests sharing of information between equity and fixed income sides of financial institutions.

To estimate the effect of aggregate habitual dual holders' presence on the firm's bond IPO process we construct two firm-specific measures of their equity ownership (HDH Ownership). The first measure, HDHO-1, is defined as the dual-holding-propensity weighted institutional equity ownership. The second measure, HDHO-2 is the equity ownership by institutional investors which DHP exceeds a certain threshold.⁴ Both of these measures aim to capture the equity ownership by shareholders which are likely to become bondholders after the bond IPO. Indeed, the correlation between HDHO-1 and HDHO-2 and actual pre-IPO equity ownership by post-IPO dual holders is 65.57% and 56.54% correspondingly. Importantly, the correlations of our measures with firm's institutional ownership are considerably lower (40.09% and 32.44%); all our results are unaffected by the inclusion of institutional ownership among control variables.

We find that pre-IPO shareholders buy on average (median) 13.02% (11.41%) of the bonds issued. Lipper eMAXX database does not, however, provide bond ownership of all investors as some types of institutional investors as well as individual investors do not have to disclose their holdings. So if we were to represent shareholder bond ownership as the fraction of the issue covered in eMAXX, its sample average (median) would go up to 47.33% (48.88%). Since institutional investors resell a significant chunk

³ Throughout the paper all economic effects, unless otherwise noted, are reported relative to the corresponding sample means.

⁴ In the paper we present results for the threshold of 1/3. The results for 0.25 and 0.40 threshold are similar.

of bonds purchased at the issuance to their clients (Schultz, 2012) the true bond purchases by shareholders at the IPO are somewhere in between these two estimates.

We then demonstrate that larger pre-IPO equity ownership by habitual dual holders is related to larger bond ownership by shareholders after the IPO. A one standard deviation larger HDHO-1 (HDHO-2) is related to the 12.03% (14.94%) larger fraction of bond issue ending up in the hands of pre-IPO shareholders. These economic effects, though quite substantial, nevertheless, provide only lower bound estimates of the actual shareholder bond purchases in the IPOs: if we had perfect foresight and were able to identify shareholders which are actually buying bonds in the IPO, then a one standard deviation larger equity ownership by these investors is related to 20.45% larger fraction of bond issue being owned by post-IPO dual holding institutions.

Importantly, habitual dual holders matter most when firm's access to bond markets is difficult. We find that the relationship between HDH pre-IPO equity ownership and bond purchases by shareholders is strongest for non-investment grade firms, particularly when market credit spreads are high.

Shareholders are not only actively buying bonds in the bond IPOs, but the number of them becoming bondholders (i.e., dual holders) is also abnormally large. Immediately after the IPO, equity ownership by dual holders is about 2.77% shares outstanding (or 26.76% relative to the sample mean) larger than in similar firms which issued public bonds before; virtually all of the effect could be attributed to pre-IPO shareholders (rather than incoming investors taking both bond and equity positions). The differences in dual holder equity ownership across bond IPO firms and firms with established access to public bond market disappear after about five quarters.

When we turn our attention to the bond IPO pricing, we find that equity ownership by habitual dual holders is associated with the lower cost of borrowing. A one standard deviation larger HDHO-1 (HDHO-2) is related to the 39.83 (35.95) bps lower offering yield spreads. For an average (median) bond offering of about 361 (278) million dollars of notional value it corresponds to about 1.33 (1.00) million dollars larger issue proceeds. As before, the results are concentrated among non-investment grade firms in times when the market perceives them to be particularly risky.

At the same time, bond IPOs by companies with larger presence by habitual dual holders have more covenants. Upon closer inspection, we find that these issues have more covenants which protect bond investors in case of ownership change, e.g., event-driven covenants (Billett, King, and Mauer, 2007).

Lastly, we show that firms with higher equity ownership by habitual dual holders are more likely to seek access to public bond markets. A one standard deviation larger HDHO-1 (HDHO-2) is related to the 9.20% (7.30%) higher likelihood of conducting bond IPO in the subsequent quarter.

One possible concern with our findings is that equity ownership by habitual dual holders is endogenous to the firm. Habitual dual holders may self-select themselves into the future bond issuers at the pre bond IPO stage rather than directly affect the bond IPO process. We conduct a battery of tests – instrumental variables, lagged regressors etc – to ensure that endogeneity is not driving our results.

Our results show that (some) institutional shareholders are among primary providers of debt capital to their portfolio firms. Information transfer within these financial institutions reduces the segmentation between debt and equity markets and facilitates firms' access to new sources of financing. Ultimately, overcoming the segmentation between debt and equity markets should result in a more efficient allocation of capital.

Our paper makes several contributions. First, we add to the literature on capital market segmentation. A large body of work has studied the consequences of investor clienteles (“preferred habitat”) and /or exogenous restrictions (e.g., taxation and transaction costs, narrow investment mandates, restrictions on foreign ownership etc) on asset allocation and pricing in the treasury (Culbertson, 1957, Simon, 1991, Greenwood and Vayanos, 2013), municipal (Kidwell and Koch, 1982, 1983), and corporate (Dick-Nielsen and Rossi, 2016) bond markets; international (Errunza and Losq, 1985, Foerster and Karolyi, 1999, Cooper and Kaplanis, 2000, Bekaert, Harvey, Lundblad, and Siegel, 2011) and domestic (Kadlec and McConnell, 1994, Bodnaruk and Ostberg, 2009) equity markets. To our knowledge, our paper is the first to demonstrate that certain types of investors help mitigate segmentation across equity and bond markets: a larger presence of habitual dual holders among firm's shareholders improves its access to bond financing.

Second, a well-established stylized fact in the capital structure literature is that many firms have overly conservative leverage, i.e., “low-leverage puzzle” (Graham, 2000). Prior literature mostly takes the view that capital structure is driven by firm’s demand for capital. Graham (2000), Goldstein, Ju, and Leland (2001), Ju, Parrino, Poteshman, and Weisbach (2005), and Strebulaev (2007) study the role of tax benefits. Morellec (2004), Parrino, Poteshman, and Weisbach (2005), and Strebulaev and Yang (2013) consider managerial entrenchments and managerial risk-aversion. Rampini and Viswanathan (2013) show that low leverage firms are largely firms with few tangible assets. Hackbarth and Mauer (2012) argue that firms choose low levels of leverage to retain financial flexibility. Bhamra, Kuehn, and Strebulaev (2010) tie leverage to macroeconomic risks.

Our paper takes the supply side perspective. We demonstrate that capital market segmentation may prevent firms from accessing some types of debt market leading to suboptimal capital structure.⁵ Our findings suggest that some institutional shareholders alleviate information asymmetries across capital markets increasing supply of bond capital available to firm. In this regard, our results support Faulkender and Petersen (2006) who show that firms with access to public bond markets have 35% larger leverage.

Third, we contribute to the nascent literature on bond IPOs. Datta, Iskandar-Datta, and Patel (2000) find that firm’s equity prices react negatively to bond IPO announcements. Hale and Santos (2008) study the demand side determinants of firm’s decision to issue public bonds for the first time. Datta et al. (1999) and Cai, Helwege, and Warga (2007) provide evidence that information problems drive the underpricing in corporate bond IPOs. Our findings suggest that the segmentation between equity and bond markets may hinder firm access to public bond markets.

Fourth, there is a growing literature on dual ownership of firm’s equity and debt by different types of institutional investors or company management (Sundaram and Yermack, 2007, Massa and Rehman, 2008, Chava, Kumar, and Warga, 2010, Jiang, Li, and Shao, 2010, Wei and Yermack, 2011, Bodnaruk and Rossi, 2016). Our paper builds on Bodnaruk and Rossi (2016) and is different from other existing

⁵ Colla et al. (2013) suggest that some firms may specialize in raising debt financing from few sources due to the lack of access to some segments of the debt markets.

work in this area in a number of important ways. To start, we do not consider any particular group of investors, e.g., banks, but focus on the overall presence of investors with holdings of both debt (bonds) and equity. This allows us to get a better grip on the extent of dual holder ownership in firms. The average shareholdings by investors which hold both company debt and equity reported in the literature are in 0.5%-0.7% range (e.g., Jiang et al., 2010, Santos and Wilson, 2007). We estimate that aggregate equity ownership by dual holders is about 10% of shares outstanding (or about 15 times larger), indicating that dual holder ownership is economically a much more important phenomenon than what could be inferred from prior studies.

Additionally, our matching mechanism allows us to link bond and equity positions held by the affiliates of financial conglomerates. Growing evidence of coordinated behavior within financial groups (Acharya and Johnson, 2007; Ritter and Zhang, 2007; Massa and Rehman, 2008; Bodnaruk et al., 2009; Ivashina and Sun, 2011, Bodnaruk and Rossi, 2016) suggests that this approach is better at capturing the complexity of investors' exposure to the firm. We would like to emphasize that our approach does not assume that financial institutions continuously monitor all their affiliates' holdings of firm securities, but rather that they evaluate their overall exposure to the firm during significant corporate events such as bond IPOs.

Fifth, we add to the literature on (equity) ownership structure and the cost of borrowing. Ferreira and Matos (2012) show that banks are more likely to act as lead arrangers in loans when they exert control over the borrower. Bhojraj and Sengupta (2003) find that firms with larger institutional ownership enjoy lower bond yields and higher ratings on new bond issues. Michaely and Vincent (2013) find that firms tend to decrease their leverage following an increase in institutional ownership. Our results show that institutional equity ownership is important for access to bond financing as long as these shareholders directly participate in bond issues. When we do not include measures of HDH equity ownership in the regressions, institutional ownership is strongly related to the characteristics of bond IPO process. However, once HDH ownership is included, institutional ownership loses its significance or becomes marginally significant at best.

2. Testable Hypotheses

A rapid growth in institutional asset management industry over the last three decades has been accompanied by a shift from broadly-based portfolios (balanced funds) toward more specialized mandates focused on specific asset classes and investment “styles” (Cardona and Fender, 2003). The trend toward specialization has been observed across all OECD countries (Bank of International Settlements (BIS), 2003). For example, Blake, Rossi, Timmermann, Tonks, and Wermers (2013) document that by 2004 U.K. pension funds largely replaced previously dominant generalist balanced managers with a mix of active specialists and multi-asset managers. Narrowing of investment mandates, among other things, is characterized by increased emphasis on investment constraints, e.g., “limits on investing in specific securities or diversification rules” (BIS, 2003).

Specialist managers do not follow securities outside of their asset class and even if they come in possession of relevant information they may lack the ability to process it efficiently and take advantage of investment opportunity. Merton (1987) provides the following example: “a bond trader who responds quickly to interest rate news by trading U.S. Treasury bonds, may not be willing to trade GNMA mortgage-backed bonds unless he has borne the set-up costs necessary to understand the effect on price of the prepayment feature of these bonds”. Thus, though specialist managers on average perform better (Blake et al., 2013, He and Xiong, 2013), the flip side of narrow investment mandates is “de facto segmentation of various asset markets from the broad financial markets” (He and Xiong, 2013). Collin-Dufresne, Goldstein, and Martin (2001), Gabaix, Krishnamurthy, and Vigneron (2007), Garleanu, Pedersen, and Poteshman (2009), Dick-Nielsen and Rossi (2016) provide evidence of segmentation in corporate bonds, mortgage backed securities, S&P500 index options, and convertible bond markets; all of these markets are mostly traded by financial institutions.

The segmentation between asset markets lowers the supply of capital available to the firm, particularly in markets in which it did not issue securities before. Firms’ ability to attract new sources of financing, therefore, should improve if there exist mechanisms which mitigate the extent of market

segmentation. We argue that one such mechanism is the presence of institutions, which affiliates tend to hold multiple types of securities issued by the same company, among the firm's investors.

We build on the growing literature on coordination within financial conglomerates.⁶ We reason that when the affiliate of the conglomerate holds some firm's security the information about the firm becomes more easily available to affiliates specializing in other markets. This information sharing can occur via a direct communication between conglomerate's divisions or indirectly through a research department. So when the firm considers issuing a new type of security, conglomerate affiliates face lower costs of finding out about the firm (Merton, 1987).

We focus on public bond IPOs as publicly listed firms' ventures into a new asset class and investigate the role of "habitual dual holders" – financial conglomerates which have the tendency to simultaneously hold both equity and bonds of their portfolio firms – in helping firms access this new source of financing. We argue that when a conglomerate's affiliate is a firm's shareholder the information about the firm is more easily available and processable for affiliates specializing in bonds. (Conditional on the size of equity and bond assets by the conglomerate), the tendency of a conglomerate to take both equity and bond positions in publicly listed firms with public bonds should be a good proxy for how likely the conglomerate's affiliates are to share this information and, *ceteris paribus*, to buy bonds in the IPO. This leads to our first hypothesis:

Hypothesis 1: In a bond IPO, financial conglomerates are more likely to buy bonds if they are the firm's shareholders and they also display a high propensity to simultaneously hold both bonds and equity of their portfolio companies.

⁶ Acharya and Johnson (2007) and Ivashina and Sun (2007) provide evidence that lending banks use private information about corporate clients to trade credit default swaps and equity. Ritter and Zhang (2007) show that lead underwriters allocate hot IPOs to affiliated funds. Massa and Rehman (2008) find that mutual funds use inside information available to the affiliated banks that are lending to firms to accumulate equity positions. Bodnaruk et al. (2009) demonstrate that financial conglomerates take positions in the targets prior to M&A deals becoming public when their affiliated investment banks advise to the bidders. Bodnaruk and Rossi (2016) find that mutual funds' voting behavior in M&As is affected by affiliates' bond ownership in the target.

Information sharing within financial conglomerate has two effects on the firm's bond issuing process. First, it increases the number of bond investors aware of the firm's characteristics leading to a larger supply of bond capital. Moreover, a larger presence of habitual dual holders among firm's shareholders should be associated with a larger fraction of supply of capital belonging to them. Our second hypothesis then is:

Hypothesis 2: Larger equity ownership by habitual dual holders is related to a larger fraction of the issue being bought by them.

Additionally, coordination within financial conglomerates reduces the information acquisition and processing costs for the bond investing affiliates as well as decreases perceived riskiness of the issuer. When a large fraction of shareholders buy bonds in the IPO, the post-IPO conflict of interest between bondholders and shareholders should also be lower. Hence, we would expect that when presence of habitual dual holders is large, the issuer should obtain better financing terms. We formulate our third hypothesis as follows:

Hypothesis 3: Larger equity ownership by habitual dual holders is related to lower bond IPO offering yield spreads.

Our testable hypotheses are based on the assumption of information sharing / coordination within financial conglomerates. If each affiliate of the financial conglomerate acts independently, then the conglomerate's dual holding propensity is irrelevant to the behavior of its bond investing. Therefore, each of the above (coordination) hypotheses is contrasted against the null (independence) of no relation between dual holding characteristics of firm's shareholders and characteristics of bond IPO process.

3. Sources of data and matching procedure

3.1. Data and sample of firms

We use data from several sources. Bond and issuer characteristics, which we also use to construct the bond IPO sample, come from Mergent's FISD database. Equity ownership comes from the Spectrum 13F

database, which consists of the quarterly 13F filings of qualified money managers to the U.S. Securities and Exchange Commission (SEC). Institutional bond holdings come from the Lipper eMAXX data set. Accounting variables and stock returns come from the Center for Research in Security Prices (CRSP)-Compustat Merged Industrial Database.

The time period of our study ranges from January 2000 to December 2013; the choice of the period is motivated by the availability of bond ownership data.

3.2. Construction of bond IPO sample

SDC Platinum database by Thomson Reuters is traditionally used as the main source of information for corporate events such as equity and bond issuances, mergers and acquisitions, repurchases etc. We found that this database, however, often misclassifies seasoned bond issuances for bond IPOs. Our estimates indicate that about 45% of bond IPOs as classified by SEC are actually seasoned bond issues. Additionally, a large number of first bond issuances by firms — we estimate it to be about 35% of all bond IPOs in our sample — are not reported in SDC.

Therefore, we use FISD database to construct our sample of bond IPOs. We identify all cases when U.S. domiciled companies issued non-convertible public bonds for the first time (we include 144-a bonds since they will become public eventually). Multiple issuers in FISD refer to the same parent identifier, which, however, is not a historic variable. In order to map FISD issuers' identifiers to their parent company in a way that correctly accounts for past merger and acquisition activity, we follow Bodnaruk and Rossi (2016). They use the company's CRSP PERMCO (or alternatively PERMCO) identifier as the unit of analysis and dynamically map all the bonds' CUSIP to the appropriate PERMNO (or PERMCO). We verify our sample by extensive cross-validation through media sources and company public filings. The following two examples illustrate our approach.

Example 1 (Ralph Lauren): In September of 2013, Ralph Lauren Corp. completed an offering of \$300 million of 2.625% senior unsecured notes due 2020. The bonds were assigned A3 rating and the issue proceeds were used for general corporate purposes. This was the first time Ralph Lauren Corp. issued

non-convertible bonds in the U.S. However, since the company issued Euro bonds several times in recent years (e.g., in 1999, 2006 etc) we do not include Ralph Lauren Corp. in our sample of bond IPOs.

Example 2 (DreamWorks Animation): in August of 2013, DreamWorks Animation issued \$300 million of 6.875% senior unsecured notes maturing in 2020. The bonds fell in the junk grade category (Ba3 debt rating from Moody's and B rating from S&P). The debt was used to repay \$155 million of a revolving credit facility as well as contribute to general purposes. Since DreamWorks did not issue straight debt before we consider this event to constitute a bond IPO.

FISD data yields us 452 bond IPOs for publicly listed firms. After imposing the filters of price and accounting information availability we end up with 388 bond IPO events involving 514 bonds. From the descriptive statistics reported in Table 1, the average (median) size of the bond offering is 363.95 (275) million dollars. About 28.79% of bonds obtain investment grade at the IPOs with the rest either receiving junk bond status (31.32%) or unrated (39.88%). The average (median) offering yield spread at the issuance is 385.74 (360.50) bps.

3.3. The matching procedure and identification of dual holders

To identify dual holders, we follow the approach of Bodnaruk and Rossi (2016). We proceed in several steps.⁷ First, we assign each institutional investor that enters Spectrum 13F or eMAXX data sets to a financial group with which it is affiliated. Given that different divisions of a financial conglomerate (banks, insurance firms, mutual fund families, etc.) appear in 13F filings and eMAXX as separate entities lacking common identifiers, we had to construct a database of financial conglomerates grouping different divisions of individual financial groups under single umbrellas, which we call "brands." This database was manually assembled using information from various public sources and performing a name-by-name

⁷ Since Lipper's data set covers only publicly traded bonds, we are able to construct measures of dual holder ownership for companies which 1) report some long-term debt; 2) have at least \$100 million in book value; 3) their bonds are covered by the Lipper eMAXX dataset. We do not believe that this affects our results in any significant way.

analysis.⁸ We assigned each financial conglomerate a brand name and created a set of identifiers for firms (“names” from Spectrum and eMAXX) affiliated with each brand.

Let us consider, for example, the “AXA” brand. “AXA” corresponds to the AXA Financial conglomerate, which as of December 31, 2005, had approximately \$643.3 billion in assets under management. AXA Financial includes the investment advisors AXA Advisors and Sanford C. Bernstein, the insurance firm AXA Equitable Life Insurance, the investment and mutual fund management firm AllianceBernstein, and the MONY group of firms (as of July 8, 2004). All these firms are assigned identifiers that uniquely match them to the “AXA” brand.

We also account for the evolution of brand affiliation. For example, “Morgan Keegan” is reported as an independent brand until March 30, 2001, when Regions Financial acquired it. Up to that date, “Morgan Keegan” was the unique brand of Morgan Keegan, but also included T.J. Raney, Scharff & Jones, Cumberland Securities, and J. Lee Peeler, all of which had been acquired by Morgan Keegan between 1989 and 1994. Effective March 30, 2001, the “Morgan Keegan” brand was retired, and all firms affiliated with it became the “Regions Financial” brand.

The matching algorithm described above has been previously employed by Bodnaruk et al. (2009) to which we refer for a more detailed description of brand construction. Additionally, the quality of the resulting estimates of equity ownership at the financial conglomerate level has been independently verified by the *Wall Street Journal*.⁹

M&A activity, bankruptcy, and other corporate events also complicate the match between debt and equity of the same firm. At any point in time, bonds issued by one company might be backed by another company. Therefore, a naive match by six-digit CUSIP (which changes over time) would result in a major

⁸ We used the directory of investment advisers maintained by the SEC (www.adviserinfo.sec.gov), Morningstar’s directory of mutual fund family websites (www.advisor.morningstar.com), and the websites of financial groups and mutual fund families. The completion dates of M&A transactions come from SDC. All affiliations and corporate control transaction dates are double-checked using extensive web querying.

⁹ On January 14, 2008, the *Wall Street Journal* (WSJ) ran a front page article on the Bodnaruk et al. (2009) paper, which alleged inside trading by advising investment banks in M&As. To provide the *Journal*’s readers with examples of suspicious transactions, the WSJ requested the authors to share the data on financial institutions’ ownership in M&As which then was double-checked by the *Journal* staff using their own sources.

loss of data. Consider merging the bonds issued by Compaq Computers Corp. with the relevant equity. Until 2002, a match by six-digit CUSIP would correctly match debt and equity, but after 2002 (when HP and Compaq merged), there is no longer a Compaq stock to be matched. The phenomenon just described is widespread, especially in the telecommunications industry where companies have very tangled family trees. To make sure debt and equity data are properly matched, we follow Rossi (2014) and implement the following three-step procedure:

1. match stocks and bonds by six-digit CUSIP or by name;
2. if the match is active until maturity, or until the end of the sample period, the match is full and the procedure is over; otherwise:
 - a. if the stock is delisted, verify why the stock is delisted;
 - b. if the stock is delisted because of M&A activity, obtain the acquiring firm permno and use the new company's stock data;
 - c. if the company is liquidated, then stop;
 - d. if the company is being reorganized (Chapter 11), then stop, but re-activate the link once the company re-emerges from bankruptcy;
3. repeat step 2 as needed.

We then assign a dual holder status to a financial conglomerate if its affiliates hold both company equity and debt and the par value of its bond positions represents at least 5%, but does not exceed 95% of a group's overall exposure — debt and equity — to the company.¹⁰ Equity and bond positions of affiliates are then aggregated at the level of conglomerate. Imposing these cutoffs ensures that we do not focus on equityholders with small bond holdings, so with no incentives to modify their behavior, or bondholders with a small equity stake, hence with no significant ability to affect corporate policies. We perform our analysis with more stringent cut-offs and the results are largely unaffected.

¹⁰ We also used different cut-offs, e.g., debt exposure between 10% (20%) and 90% (80%) of overall exposure; the results are not affected.

There are several important caveats to our identification of dual holders. First, since the data on equity ownership and debt ownership cover only institutional investors, we are able to identify only institutional dual holders. It is plausible that in some companies, e.g., those with smaller institutional ownership, there are wealthy private investors that hold significant stakes in equity and debt. Second, we only have information about company public debt ownership, but not private debt or bank loans. Third, the eMAXX bond ownership database does not cover hedge funds. All of these factors are likely to lead to underestimation of the number of dual holders and the magnitude of their equity ownership in the firm. Our estimates, therefore, provide a lower bound for the presence of dual holders in U.S. corporations.

Ownership data used in our study, while helpful at identifying aggregate equity and bond positions by dual holding financial conglomerates, do not allow us to break them down by institutional investor types, e.g., passive or actively managed mutual funds, hedge funds, or proprietary trading positions. We are also unable to achieve a sharper identification of dual holders by eliminating the positions by passive investors such as index funds. This happens due to the fact that in most cases, Spectrum 13F already aggregates positions of different subsidiaries that file jointly at some intermediate level (though there does not seem to be any clear pattern how this aggregation is done across different financial groups or over time). At the same time, the available mutual fund level equity ownership data (s12 filings) provide only partial coverage as it contains positions by mutual funds which are marketed to retail investors.

3.4. Dual Holding Propensity and Equity Ownership by Habitual Dual Holders

We identify shareholders who are likely to buy bonds in bond IPOs, i.e., likely to become company dual holders after the event. We posit that the conglomerate is more likely to do so when it is a “habitual dual holder” — it has a high tendency to hold bonds of their equity portfolio companies which issued public bonds. We calculate a conglomerate’s dual holding propensity (DHP) as the ratio of the value of equity in dual holding positions (i.e., simultaneous ownership of equity and bonds) to the value of equity invested in firms with public bonds outstanding.

Consider, for example, Duff & Phelps Investment Management. At the end of December 2005 the value of its equity portfolio was 1,783.1 million dollars; 1,247.8 millions of this amount was invested in shares of companies with public bonds, of which 173.8 millions was the value of equity positions in companies which bonds also were held by Duff & Phelps. The dual holding propensity of Duff & Phelps is calculated as the ratio of 173.8 to 1,247.8 and is equal to 0.1393; this puts Duff & Phelps at the 97th percentile of DHP distribution of all institutional investors in the fourth quarter of 2005.

We report descriptive statistics of DHP in Table 1. DHP of an average (median) institutional investor is very small at 0.0119 (0.0000). In fact, for over 90% of institutions dual holding propensity is equal to zero. Once we require an institution to have positive dual holding propensity, we find that the average (median) dual holding propensity for this subset is 0.1412 (0.0538). Moreover, some institutions demonstrate very large dual holding propensities as could be inferred from large standard deviation of DHP distribution. This observation is confirmed when we consider top conglomerates by the average DHP over our sample period (reported in Appendix B).

Dual holding propensity is a very persistent characteristic (Table 2): the likelihood that a conglomerate in a top quartile by DHP will remain in this group after 1 (2, 3, 4, and 8) quarter is 84.50% (83.23%, 81.41%, 81.09%, and 82.26%); another 12.33% (13.15%, 14.54%, 14.55% and 11.51%) migrate from the top quartile to the second quartile. So even after two years over 90% of top quartile conglomerates still show above median DHP.

To assess the extent of aggregate habitual dual holder presence among company shareholders, we construct two measures of their equity ownership (HDH Ownership). The first measure, HDHO-1, is defined as the dual-holding-propensity weighted institutional equity ownership. The second measure, HDHO-2 is the equity ownership by institutional investors which dual holding propensity exceeds a threshold of 1/3. HDHO-1 has the property that it takes into account all shareholders with dual holding capacity; it does not, however, represent actual number of shares held by these investors. HDHO-2, on the other hand, focuses only on the subset of shareholders who are most likely to participate in the bond IPO, but has an advantage of representing actual shareholder ownership.

Bond IPOs do not have to be publicly announced. Therefore, when constructing our sample of bond IPOs we only have their offering dates. Bond IPOs process is conducted within 6-8 weeks, but for high yield issuers it can take up to three months (Tresnowski and Nowak, 2004, Mayer Brown, 2013). To ensure that our measures of ownership and dual holding propensity precede information about the upcoming issue becoming available, in all of our analysis we require a time gap of at least one full quarter between the date of variables measurement and IPO offering date.

Consider again DreamWorks Animation's bond IPO. At the end of the first quarter of 2013 – the closest data point preceding the IPO date by at least 3 months – DreamWorks had 47 shareholders with positive DHP. HDHO-1 for DreamWorks is calculated as the sum of equity stakes of these shareholders multiplied by their dual holding propensities and is equal to 0.1050. Eleven of these shareholders had DHP in excess of 1/3.¹¹ HDHO-2 is then calculated as the sum of equity stakes of these eleven shareholders and is equal to 0.0575.

Both our measures aim to capture the equity ownership by shareholders which are likely to become bondholders after the bond IPO. Indeed, the correlation between HDHO-1 and HDHO-2 and actual pre-IPO equity ownership by post-IPO dual holders is 65.57% and 56.54% correspondingly. Importantly, the correlations of our measures with firm's institutional ownership are considerably lower (40.09% and 32.44%); all our results are unaffected by inclusion of institutional ownership among control variables.

In Table 1 we report descriptive statistics of our variables for different subsamples used in our study. In a full set of COMPUSTAT firms, average (median) HDHO-1 / HDHO-2 is 2.61% / 2.38% (1.83% / 0.90%) of company equity. Bond IPO companies have larger presence of habitual dual holders among their shareholders: their average (median) HDHO-1 / HDHO-2 is 3.86% / 3.75% (3.04% / 1.91%). Importantly, both of them provide only lower bound estimate of actual shareholder involvement in bond IPOs: on average (median) shareholders which bought shares in the bond IPOs held 10.84% (8.04%) of firm's shares outstanding.

¹¹ The shareholders with DHP above 1/3 were Prudential, AIG, Advantus Capital Management, ING, Metropolitan Life, AXA, Deutsche Bank, RBC, Nationwide, Vanguard, and Liberty Mutual.

In Table 3 we study habitual dual holder ownership in bond IPO firms and in comparable firms prior to the event. We observe that according to both measures habitual holders own larger percentage of event firms shares than shares of similar firms. The difference in ownership is very similar in magnitude going back as far as eight quarters before the IPO. The slight upward trend in habitual dual holder ownership of all groups of firms is likely to be related to the improving coverage of Lipper eMAXX bond ownership database over time.

4. Empirical findings

4.1. Conglomerate's dual holding propensity and bond purchases in the IPO

We start by investigating who buys bonds in bond IPOs. For each bond IPO, we identify all bond investors in the eMAXX bond ownership database at the end of the quarter right after the event. We determine whether the investor held firm's bonds after the IPO and the par amount of its holdings. We then move back in time to the closest end of the quarter preceding the IPO date by at least three months to find out whether the investor was the firm's shareholder prior to the bond IPO, the size of its equity stake, and its dual holding propensity at that point. So, for example, for DreamWorks' bond IPO which took place on August 7, 2013, we consider investors' bond ownership in the firm on September 30th, and their equity ownership and dual holding propensities on March 31st, 2013.

We then proceed to relate conglomerate's bond ownership after the IPO to its pre-IPO equity ownership in the company, dual holding propensity, and a set of control variables. The latter include investor characteristics (size of equity assets under management, par value of aggregate bond holdings), issuer (size, book-to-market, institutional equity ownership, cash, leverage, ROE, Growth of Sales) and issue characteristics (offering amount, time to maturity, change of control provision, redeemable, global offer dummies, junk bond / non rated bond dummies), and bond market variables (term spread, credit spread). Additionally, we include industry (SIC2) and yearly dummies. All investor and issuer characteristics are measured at the end of the previous calendar year. All variables are described in Appendix A. Standard errors are double-clustered at the investor and time (year) level.

The results are presented in Table 4. In the probit analysis (first two specifications), the dependent variable is a bond ownership dummy, which takes the value of 1 if a conglomerate held firm's bonds after the IPO and zero if it did not. In the Tobit analysis, the dependent variables is the logarithm of (one plus) the par value of a conglomerate's bond position.

We find that bond investors which are firm's shareholders are considerably more likely to buy its bonds at the IPO. A one standard deviation larger pre-IPO equity ownership is related to 7.68% higher likelihood of conglomerate being a post-IPO bond holder and 66.85% larger bond stakes.¹²

Dual holding propensity on its own is not related to bond ownership. So when a conglomerate is not a shareholder of the firm, its tendency to hold both equity and bonds of its portfolio companies does not affect its willingness to participate in the bond IPO. It does, however, amplify the effect of equity ownership, as the interaction terms in the regressions suggest. For a conglomerate with the DHP at the 75% percentile of its distribution (approximately 0.1650), a one standard deviation larger equity ownership is associated with 8.23% higher likelihood of holding bonds right after the IPO and 68.63% larger size of the bond position. In contrast, a one standard deviation larger equity ownership for a conglomerate at the 25% percentile of DHP distribution (0.0000) is related to only 5.85% larger likelihood of becoming a bondholder and 56.01% larger bond stake.

There are two important observations we would like to make. First, the fact that dual holding propensity of a conglomerate has an effect on its bond IPO participation only in conjunction with prior equity position suggests sharing of information from equity to fixed income sides of financial institutions. Second, since we include the size of the equity and bond stakes of the financial group among our control variables, it rules out the potential criticism that our results could be purely mechanical, i.e., due to larger financial institutions being more likely to participate in any new security issuance.

¹² We also used shareholder dummy instead of equity ownership (unreported). We find that bond investors who are also firm's shareholders are about 37.45% more likely to participate in bond IPO than bond investors who did not hold firm's shares prior to the IPO.

4.2. *How much bonds do shareholders buy?*

Prior results established that, at the individual investor level, shareholders with bond appetite participate in the bond IPOs to a larger degree than other bond investors. Do bond purchases by shareholders aggregate to a meaningful amount relative to the total size of the issue? If so, how strong is the relationship between equity ownership by habitual dual holders and bond purchases by shareholders?

From the descriptive statistics reported in Table 1, we observe that on average (median), bond ownership by pre-IPO shareholders is 13.02% (11.41%) of the size of the issue. Lipper eMAXX does not, however, provide bond ownership of all investors as some types of institutional investors as well as individual investors do not have to disclose their holdings. So, if we were to represent shareholder bond ownership as the fraction of the issue covered in eMAXX, its sample average (median) would go up to 47.33% (48.88%). Institutional investors resell a significant chunk of bonds purchased at the issuance to their clients (Schultz, 2012). So the true bond purchases by shareholders at the IPO are somewhere in between these two estimates.

In Table 5, we relate our two measures of pre-IPO habitual dual holder equity ownership to the post-IPO fraction of bond issue held by pre-IPO shareholders. Additionally, we consider a third measure — actual equity ownership by shareholders which purchased IPO bonds. This measure, even though it suffers from a look-ahead bias, allows us to evaluate how well our two main measures capture shareholder bond buying behavior.

We find that larger pre-IPO equity ownership by habitual dual holders is associated with larger bond ownership by the pre-IPO shareholders after the IPO. A one percentage larger equity ownership by habitual dual holders translates into about 0.45% larger bond ownership by shareholders.¹³ In terms of economic impact, a one standard deviation larger HDHO-1 (HDHO-2) is related to the 12.03% (14.94%) larger fraction of bond issue (relative to a sample mean) ending up in the hands of pre-IPO shareholders.

¹³ We also performed the analysis using post-IPO bond ownership by shareholders relative to fraction of the issue covered in Lipper eMAXX (unreported). The results are very similar.

At the same time, these findings provide only lower bound estimates of the actual shareholder bond purchases in the IPOs: if we were to have perfect foresight and were able to identify shareholders which are actually buying bonds in the IPO, then a one standard deviation larger equity ownership by these investors is related to 20.45% larger fraction of bond issue (relative to a sample mean) being owned by post-IPO dual holding institutions.

The results on shareholder purchases of bonds at the individual investor level and at the aggregate level suggest that habitual dual holders increase the supply of bond capital. We argue that this happens because shareholders have information advantage over those bond investors which do not have equity positions in the firm. If that is the case, we would expect habitual dual holder presence among firm's shareholders to matter most when the firm's access to capital is complicated.

We conduct two cross-sectional tests to support our conjecture. First, we split bond IPOs by bond rating into investment grade and non-investment grade / non-graded subsamples. We find (Table 6, Panel A) that shareholder equity ownership and bond ownership are correlated only for junk bonds. Second, we explore the variation in the cost of external capital as proxied by the credit spread between BBB- and AAA- rated corporate bonds. From Table 6, Panel B we could see that bond purchases by shareholders in non-investment grade firms are particularly strong when credit spreads are high.

4.3. How many shareholders participate in bond IPOs?

Thus far we have established that shareholders purchase a significant portion of IPO bonds. Is the number of shareholders buying bonds, i.e., becoming dual holders in the firm, unusual or is it similar to what could be observed for firms which issued public bonds for some time?

We address this question in Table 7. We study dual holder equity ownership for IPO and non-IPO firms with public bonds. We consider two measures of dual holder equity ownership. The first one, DHEO-1 is the fraction of equity owned by shareholders which also hold bond stake in the company at that point in time. The second one, DHEO-2 is defined likewise for non-IPO firms; for the IPO firms we calculate it as the fraction of equity owned by pre-IPO shareholders which remain with the company until

that point and also hold bond stake in the company. Contrasting the results for DHEO-1 and DHEO-2 allows us to evaluate the impact of pre-IPO shareholders on the post-IPO difference in dual holder equity ownership between sample and control firms.

We relate measures of dual holder equity ownership to a set of company characteristics and a dummy variable indicator which takes the value of one if a company undertook a bond IPO and zero otherwise. We perform this analysis for quarters one through five after the IPO. That is, for example, for quarter one analysis, each quarter we only keep firms which did bond IPO one quarter before (sample firms) and firms with public bonds which did bond IPO more than one quarter before (control firms).

We find that immediately after the IPO, equity ownership by dual holders is about 2.77% larger in terms of shares outstanding than in similar firms which issued public bonds before; this represents about 26.78% of the unconditional mean. Virtually all of the difference in dual holder equity ownership could be attributed to pre-IPO shareholders (rather than incoming investors taking both bond and equity positions). The differences in dual holder equity ownership across bond IPO firms and firms with established access to public bond market disappear after about five quarters. In unreported analysis we compared post-IPO equity ownership by dual holders in bond IPO firms and control groups of firms matched on observables (i.e., industry and size; size and book-to-market ratio); the results are statistically very similar and economically slightly stronger.

Thus, shareholders not only purchase large quantities of bonds at the bond IPO, but also the number of them doing this is unusually high.

4.4. Habitual dual holder equity ownership and IPO bond pricing

We now explore whether the presence of habitual dual holders not only helps the firm to sell its bonds, but also to do so at a better price. There are two reasons why we expect this price effect. First, coordination within financial conglomerates should reduce the information acquisition and processing costs for the bond investing affiliates as well as decrease perceived the riskiness of the issuer. Second,

when a large fraction of shareholders buy bonds in the IPO, it leads to better alignment of bondholder and shareholder interests and the post-IPO conflict of interest between them should be lower.

We relate bond offering yield spreads to pre-IPO measures of dual holder equity ownership in Table 8. We control for a set of issuer and issue specific characteristics, as well as characteristics of bond market (term spread and credit spread). Importantly, in Specifications 3 and 4 we utilize a very granular set of 22 bond rating dummies — one for each bond rating, i.e., AAA, AA etc — which allows us to evaluate the economic effect of HDH ownership on the cost of bond financing within bond rating.

Equity ownership by habitual dual holders is related to a lower cost of bond financing. A one standard deviation larger HDHO-1 (HDHO-2) is related to the 39.83 (35.95) bps lower offering yield spreads or 10.18% (9.19%) relative to unconditional mean. To put these results in the perspective, for an average (median) bond offering of about 361 (278) million dollars of notional value it corresponds to about 1.33 (1.00) million dollars larger issue proceeds.

Prior literature (Bhojraj and Sengupta, 2003, Michaely and Vincent, 2013) found that firms with larger institutional equity ownership pay lower interest on their bonds. We show that when both HDH ownership and institutional ownership are included in the regression the latter loses its statistical significance. If we were to exclude HDH ownership (unreported), institutional ownership becomes strongly statistically significant, its coefficient also almost doubles. The fact that HDH ownership suppresses institutional ownership suggests that institutional equity ownership is important for access to bond financing as long as these shareholders directly participate in bond issues.

Similar to the analysis of post-IPO bond ownership, we conduct two cross-sectional tests to provide additional support to our findings. In Table 9, Panel A we split bonds by their ratings; in Panel B we additionally interact measures of HDH ownership with credit spread. Consistent with prior results, we find that habitual dual holder equity ownership reduces the cost of bond financing primarily for non-investment grade firms, particularly when accessing bond markets for these firms is expensive.

4.6. Bond IPO covenants

So far we have found that shareholders with high dual holding propensities XXX

4.5. Habitual dual holder equity ownership and the decision to undertake bond IPO

So far we have found that shareholders with high dual holding propensities are prone to buying large quantities of IPO bonds which leads to better financing terms for the issuing firms. One natural question which follows from these findings is whether firms recognize the benefits of HDHs among their shareholders. We study the effect of habitual dual holder equity ownership in the firm on its decision to undertake a public bond IPO by performing a set of probit regressions (Table 10).

Each quarter, we consider non-financial / non-utility COMPUSTAT firms which do not have public bonds outstanding. We then investigate whether a firm has done a bond IPO in the near future.

In Specifications 1 and 2 a bond IPO dummy takes the value one if the IPO occurred at some date in the second quarter from the current quarter, i.e., between three and six months in the future, zero otherwise. To mitigate concerns related to the rumors about the upcoming event circulating before the announcement, in Specifications 3 and 4 we remove habitual dual holder ownership and IPO decision even further apart and require that IPO occurred three full quarters in the future.

Firms with larger HDH ownership are considerably more likely to do bond IPOs. A one standard deviation larger HDHO-1 (HDHO-2) is related to the 9.20% (7.30%) higher likelihood of conducting bond IPO in the second subsequent quarter (14.47% (11.72%) when we consider the fourth quarter ahead). This represents about 1/3 of economic impact of firm size (+34.19%) and cash holdings (-27.32%) and is similar to the effect of leverage (+14.03%). Additionally, we executed our analysis only on the set of firms which are similar to bond IPO firms by observable characteristics, e.g., industry and size, and size and book-to-market ratio. In these unreported findings, our baseline results are fully confirmed; they are also economically stronger.

4.4. Bond IPO process and potential endogeneity of habitual dual holder ownership

One possible concern with our findings is that equity ownership by habitual dual holders could be endogenously determined. It is plausible that HDH-conglomerates prefer less risky firms within given

credit rating category. They take equity positions in these firms and when these firms issue bonds buy them as well. Since these borrowers are less risky it would ensure a negative correlation between offering yield spreads and equity ownership by these financial conglomerates. This suggests that habitual dual holders are not directly affecting the IPO process, but rather self-select themselves into future bond issuers at the pre bond IPO stage. Importantly, this interpretation also suggests information sharing / coordination within HDH-conglomerates.

We believe that this chain of events is unlikely for a number of reasons. First, the self-selection story would require that HDH equity ownership is lower in firms with more difficult access to external financing. However, (in unreported results) we do not find any relationship between equity ownership by habitual dual holders and firm's characteristics like Tobin's Q, leverage, cash holdings, dividend yield, or growth of sales which are traditionally included in the indexes of financial constraints (e.g., Kaplan and Zingales, 1997, Whited and Wu, 2006). This holds true whether we consider a full sample of COMPUSTAT firms without public bonds, restrict our analysis to firms matched on observables (e.g., size and book-to market ratio; industry and size; size, leverage, and institutional ownership etc), or adopt simultaneous regression approach (e.g., Bhojraj and Sengupta, 2003, Ferreira and Matos, 2008). Likewise, we find no evidence that high HDH ownership firms are able to borrow from banks at lower rates before bond IPO.

Second, to achieve sharper identification we instrument measures of habitual dual holder equity ownership. We borrow from the literature on institutional investor investment preferences and follow Jiang et al. (2010) and Bennett, Sias, and Starks (2003) in using the Amihud's stock liquidity and price per share as our instruments. Both of these variables are characteristics of firm's equity which are unrelated to its debt.

In Table 11 we report the results of instrumental regressions. Consistent with the literature, they show that habitual dual holders establish higher presence in companies with higher stock liquidity (lower Amihud measure) and in higher priced stocks. The F-test of the joint significance of the instruments rejects the null of weak instruments (Staiger and Stock, 1997).

In Table 12 we re-estimate our analysis of bond purchases and IPO offering spreads using the instrumented measures of HDH ownership. The results confirm previous findings while the economic impact now becomes larger. One standard deviation larger value of instrumented HDHO-1 (HDHO-2) is associated with 24.29% (39.30%) larger fraction of bond issue ending up in the hands of pre-IPO shareholders and with 1.07% (1.10%) smaller offering spreads. Importantly, Hansen’s test of overidentification always rejects the null, providing supporting evidence of the quality of our instruments.

Third, to rule out that habitual dual holders flock to future bond IPO companies because of private information about the upcoming event we explore the HDH equity ownership around bond IPOs (Table 3). While we do find that HDH ownership in bond IPO firms slowly increases prior to the event so does the HDH ownership in similar firms which do not undergo bond IPO. We attribute these patterns to the improvement in bond ownership covered by Lipper eMAXX database over time. Additionally, all our results carry on when we use HDH ownership lagged by one year instead of pre-IPO HDH ownership (see Table 10 for the bond IPO decision; results for other outcome variables available upon request).

5. Conclusion

We study firms’ decisions to enter public bond markets for the first time (bond IPOs). We show that firm’s ability to access public bond market is greatly improved by the presence of “habitual dual holders” (HDHs) – financial conglomerates which have the tendency to simultaneously hold both equity and bonds of their portfolio firms – among its shareholders. HDHs are more likely to buy bonds in the IPO and take larger bond positions than bond investors without equity stake in the firm. Larger equity ownership by HDHs is associated with larger part of the issue ending up in the hands of pre-IPO shareholders, and lower offering yield spreads.

Our results show that (some) institutional shareholders are among primary providers of debt capital to their portfolio firms. Information transfer within these financial institutions reduces the segmentation between debt and equity markets and facilitates firms’ access to new sources of financing. Ultimately,

overcoming the segmentation between debt and equity markets should result in a more efficient allocation of capital.

Appendix A. Description of variables

Variable	Description of variable and source of data
Dual holding propensity, DHP	The ratio of the value of equity in dual holding positions (i.e., simultaneous ownership of equity and bonds) to the value of equity invested in firms with public bonds outstanding.
HDHO-1	Dual-holding-propensity weighted institutional equity ownership.
HDHO-2	The equity ownership by institutions with a dual holding propensity exceeding a threshold of 1/3.
DHEO-1	The fraction of equity owned by shareholders which also hold bond stake in the company.
DHEO-2	Defined like DHEO-1 likewise for non-bond IPO firms; for the IPO firms it is calculated as the fraction of equity owned by pre-IPO shareholders which remain with the company until that point and also hold bond stake in the company.
Institutional ownership (IO)	Year-end fraction of shares outstanding owned by institutional fund managers. Source: Spectrum 13F.
Market capitalization (MarketCap)	Year-end market value of company equity. Source: CRSP.
Book-to-market (B/M)	The ratio of book value of equity to its market value. Source: Compustat.
Growth of sales	The percentage growth in sales from the past year. Source: Compustat.
Leverage	The ratio of long-term debt to the total assets of the firm. Source: Compustat.
Cash	The ratio of cash holdings to total assets. Source: Compustat.
Dividend yield	The ratio of cash dividend to total assets. Source: Compustat.
ROE	The ratio of earnings to average equity for the prior fiscal year. Source: Compustat.
Offering yield spread	The difference in annualized yield between IPO bond and Treasury bond of most similar maturity.

Appendix B

Financial conglomerate with the highest average dual holding propensity

We report top 15 financial conglomerates with the highest average dual holding propensity observed in our sample. Dual Holding Propensity (DHP) is the ratio of the value of equity in dual holding positions (i.e., simultaneous ownership of equity and bonds) to the value of equity invested in firms with public bonds outstanding.

	DHP	Rank
Conning Asset Management	0.70789	1
Prudential	0.67616	2
New York Life Insurance	0.64165	3
Allstate Insurance	0.61393	4
Metropolitan Life Insurance	0.59413	5
AIG	0.58316	6
ING	0.57426	7
Shenkman Capital Management	0.56664	8
Hartford Investment Management	0.53911	9
AEGON	0.53171	10
Harleysville Insurance	0.51348	11
General Electric	0.49329	12
Advantus Capital Management	0.48301	13
Allianz	0.45258	14
Members Capital Advisors	0.44864	15

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Table 1

Descriptive statistics of main variables

We present descriptive statistics on the variables used in our study. We report it for the following groups of variables used in our study: a) bond investor characteristics covered in the Lipper eMAXX bond ownership dataset; b) bond characteristics, obtained from FISD; c) firm characteristics for the full sample of COMPUSTAT firms; d) firm characteristics for the sample of bond IPO firms; e) firm characteristics (at the bond level) for the sample of bonds which ownership is covered Lipper eMAXX after the bond IPO. The data covers the period between January 2000 and December 2013. Key variables of interest are Dual Holding Propensity (DHP): the ratio of the value of equity in dual holding positions (i.e., simultaneous ownership of equity and bonds) to the value of equity invested in firms with public bonds outstanding, and two measures of equity ownership by habitual dual holders: HDHO-1 and HDHO-2. HDHO-1 is defined as the dual-holding-propensity weighted institutional ownership of the firm. HDHO-2 is measured as the equity ownership by institutions with a dual holding propensity exceeding a threshold of 1/3. All variables are described in Appendix A.

	n	mean	median	std	Q1	Q3	p90
Bond investor characteristics							
DHP	126815	0.012	0.000	0.067	0.000	0.000	0.000
DHP (if DHP>0)	10664	0.141	0.054	0.188	0.011	0.208	0.427
Bond characteristics							
Offering yield spread	514	385.740	360.500	250.364	175.000	553.000	729.000
Time to maturity	514	8.923	8.075	4.670	7.014	10.017	10.047
Offering amount (ths)	514	363946	275000	329714	185000	450000	650000
Change of control	514	0.264	0.000	0.441	0.441	1.000	1.000
Redeemable	514	0.949	1.000	0.220	1.000	1.000	1.000
Global offer	514	0.134	0.000	0.340	0.000	0.000	1.000
Non-Investment grade	514	0.313	0.000	0.464	0.000	0.000	1.000
Unrated	514	0.399	0.000	0.490	0.000	0.000	1.000
Firm characteristics (full sample)							
HDHO-1	108250	0.026	0.018	0.026	0.006	0.038	0.062
HDHO-2	108250	0.024	0.009	0.035	0.001	0.031	0.071
Market cap (mln)	108250	1768.266	327.328	11162.166	115.015	961.890	2784.628
Institutional ownership	108250	0.483	0.504	0.249	0.280	0.685	0.813
Book-to-market ratio	108250	0.737	0.750	3.911	0.249	0.758	1.186
Cash	108250	0.242	0.165	0.236	0.045	0.374	0.640
Leverage	108250	0.120	0.027	0.172	0.000	0.199	0.361
Dividend yield	108250	0.007	0.000	0.019	0.000	0.003	0.023
ROE	108250	0.082	0.073	0.323	-0.020	0.147	0.249
Growth of sales	108250	0.146	0.110	0.336	0.010	0.247	0.471
Firm characteristics (bond IPO sample)							
HDHO-1	388	0.039	0.030	0.031	0.015	0.054	0.090
HDHO-2	388	0.038	0.019	0.044	0.006	0.058	0.103
Market cap (mln)	388	4971.133	1112.668	14630.220	450.632	3066.186	10570.697
Institutional ownership	388	0.587	0.616	0.214	0.458	0.755	0.846
Book-to-market ratio	388	0.858	0.803	3.008	0.300	0.820	1.340
Cash	388	0.105	0.050	0.138	0.017	0.135	0.287
Leverage	388	0.229	0.206	0.186	0.064	0.357	0.502
Dividend yield	388	0.008	0.000	0.020	0.000	0.008	0.026
ROE	388	0.103	0.097	0.526	0.018	0.178	0.251
Growth of sales	388	0.128	0.086	0.292	0.010	0.205	0.476
	n	mean	median	std	Q1	Q3	p90

Firm characteristics at the bond level (sample with available post-IPO bond ownership)

Bond ownership by shareholders	383	0.130	0.114	0.099	0.058	0.185	0.252
Equity ownership by shareholders buying bonds	383	0.108	0.080	0.101	0.026	0.162	0.255
HDHO-1	383	0.044	0.037	0.033	0.018	0.063	0.094
HDHO-2	383	0.043	0.026	0.045	0.007	0.069	0.111
Market cap (mln)	383	9683.831	2151.539	22714.017	712.287	7359.976	23349.096
Institutional ownership	383	0.607	0.634	0.204	0.480	0.775	0.851
Book-to-market ratio	383	0.709	0.820	3.092	0.457	0.925	1.189
Cash	383	0.119	0.059	0.145	0.018	0.178	0.325
Leverage	383	0.207	0.176	0.187	0.022	0.339	0.477
Dividend yield	383	0.009	0.000	0.020	0.000	0.010	0.027
ROE	383	0.075	0.108	0.445	0.026	0.198	0.287
Growth of sales	383	0.129	0.085	0.258	0.009	0.187	0.396
Term spread	383	1.743	2.040	1.172	0.740	2.800	3.010
Credit spread	383	1.080	0.980	0.390	0.860	1.240	1.350

Table 2

Persistence of dual holding propensity

We report the results on the persistence of dual holding propensity. Each quarter we identify financial conglomerates in the highest (lowest) quartile of dual holding propensity. Dual holding propensity is defined as the ratio of the value of equity in dual holding positions (i.e., simultaneous ownership of equity and bonds) to the value of equity invested in firms with public bonds outstanding. Investors are followed for eight quarters to determine which quartile they belong in the subsequent quarter. Quartile 4 (1) represents the highest (lowest) DHP quartile. Numbers reported are percentages. Panel A (B) reports on DHP persistence for conglomerates in the top (bottom) quartile of DHP distribution.

Panel A: Persistence in dual holding propensity for investors in the top quartile of DHP in Quarter 0

Quarter	Quartile			
	4	3	2	1
0	100.00			
1	84.50	12.33	2.65	1.35
2	83.23	13.15	2.97	1.49
3	81.41	14.54	3.05	1.72
4	81.09	14.55	3.35	2.03
8	82.26	11.51	4.17	3.36

Panel B: Persistence in dual holding propensity for investors in the bottom quartile of DHP in Quarter 0

Quarter	Quartile			
	4	3	2	1
0				100.00
1	2.93	8.49	25.84	63.71
2	3.89	11.66	27.36	58.11
3	5.03	14.75	29.30	51.59
4	5.75	16.96	31.23	46.41
8	9.57	23.72	32.28	34.72

Table 3**Habitual dual holder equity ownership around bond IPOs**

We present descriptive statistics of habitual dual holder equity ownership (HDH ownership) around the bond IPOs. The sample of IPO covers period between January 2000 and December 2013. We consider two measures of HDH ownership. HDHO-1 is defined as the dual-holding-propensity weighted institutional ownership. HDHO-2 is measured as the equity ownership by institutions with a dual holding propensity exceeding a threshold of 1/3. Dual holding propensity is defined as the ratio of the value of equity in dual holding positions (i.e., simultaneous ownership of equity and bonds) to the value of equity invested in firms with public bonds outstanding. Quarter 0 (Q_t) is the quarter of bond IPO; HDH ownership at this date corresponds to the first end-of the quarter ownership after the bond IPO. We present average HDH ownership for bond IPO firms as well as for the firms matched by industry (SIC2) and size (within 30% of market capitalization) as well as firms matched by size (within 30%) and book-to-market. We keep up to 10 control firms which satisfy matching criteria; if matching procedure yields more than 10 matched, those which come closest according to the second criterion are maintained. We require both bond IPO firms and control firms to have institutional equity ownership data available for quarters -4 through +2 around bond IPO. Panel A (B).reports the means values of HDHO-1 (HDHO-2); t-statistics for the difference in sample averages are reported as well.

Panel A: HDHO-1

	IPO firms	IS matched	SBM matched	IPO vs IS match		SBM match vs IPO	
				t-test	p-value	t-test	p-value
Q_{t-4}	0.0385	0.0293	0.0303	4.11	(0.01)	3.77	(0.01)
Q_{t-3}	0.0390	0.0317	0.0323	3.08	(0.01)	2.90	(0.01)
Q_{t-2}	0.0413	0.0330	0.0325	3.34	(0.01)	3.67	(0.01)
Q_{t-1}	0.0418	0.0344	0.0344	2.95	(0.01)	3.08	(0.01)
Q_t	0.0420	0.0338	0.0349	3.30	(0.01)	2.90	(0.01)
Q_{t+1}	0.0444	0.0382	0.0372	2.50	(0.02)	3.04	(0.01)
Q_{t+2}	0.0449	0.0384	0.0368	2.46	(0.02)	2.97	(0.01)

Panel A: HDHO-2

	IPO firms	IS matched	SBM matched	IPO vs IS match		SBM match vs IPO	
				t-test	p-value	t-test	p-value
Q_{t-4}	0.0366	0.0239	0.0270	3.98	(0.01)	3.02	(0.01)
Q_{t-3}	0.0362	0.0274	0.0280	2.73	(0.01)	2.58	(0.02)
Q_{t-2}	0.0396	0.0305	0.0310	2.55	(0.02)	2.43	(0.02)
Q_{t-1}	0.0411	0.0325	0.0328	2.33	(0.03)	2.33	(0.03)
Q_t	0.0425	0.0310	0.0335	3.22	(0.01)	2.51	(0.02)
Q_{t+1}	0.0456	0.0340	0.0352	3.08	(0.01)	2.83	(0.01)
Q_{t+2}	0.0456	0.0335	0.0341	3.10	(0.01)	3.02	(0.01)

Table 4

Holdings of IPO bonds by firm's shareholders: investor level

We report the results of multivariate regressions of the relationship between pre-IPO bond investor equity ownership in the firm, its dual holding propensity (DHP), and the bond investor holding of IPO bonds after the event. For each bond IPO, we identify all bond investors in the eMAXX bond ownership database at the end of the quarter right after the event. We determine whether the investor held firm's bonds after the IPO and the par amount of its holdings. We then move back in time to the closest end of the quarter preceding the IPO date by at least three months to find out whether the investor was the firm's shareholder prior to the bond IPO, the size of its equity stake, and its dual holding propensity at that point. All investor and issuer characteristics are measured at the end of the previous calendar year. All variables are described in Appendix A. Standard errors are double-clustered at the investor and time (year) level.

	<u>probit</u>			<u>probit</u>			<u>Tobit</u>		<u>Tobit</u>	
	estimate	t-stat	ME	estimate	t-stat	ME	estimate	t-stat	estimate	t-stat
DHP × Equity ownership				36.988	(2.42)	4.878			29.931	(3.24)
DHP	-0.075	(-0.55)	-0.010	-0.116	(-0.84)	-0.015	-0.006	(-0.03)	-0.043	(-0.24)
Equity ownership	19.737	(4.16)	2.598	15.020	(3.11)	1.981	26.170	(11.71)	21.928	(2.24)
log(Offering amount)	0.268	(3.63)	0.035	0.270	(3.69)	0.036	0.576	(27.59)	0.577	(27.35)
log(Total bond assets)	0.233	(21.69)	0.031	0.222	(22.70)	0.029	0.447	(25.93)	0.442	(25.69)
log(Total equity assets)	0.013	(3.63)	0.002	0.009	(2.30)	0.001	0.104	(9.90)	0.092	(7.87)
Log(Time to maturity)	-0.113	(-2.28)	-0.015	-0.111	(-2.26)	-0.015	-0.196	(-15.59)	-0.194	(-15.41)
Change of Control dummy	0.086	(0.97)	0.011	0.086	(0.97)	0.011	0.108	(8.83)	0.107	(9.53)
Redeemable dummy	0.040	(0.32)	0.005	0.033	(0.27)	0.004	0.047	(0.25)	0.040	(0.22)
Global offer dummy	0.024	(0.31)	0.003	0.024	(0.31)	0.003	0.029	(1.60)	0.028	(1.55)
Junk bond dummy	0.002	(0.03)	0.000	0.003	(0.04)	0.000	0.005	(0.10)	0.006	(0.12)
Not rated bond dummy	0.007	(0.08)	0.001	0.009	(0.11)	0.001	0.003	(0.14)	0.006	(0.24)
log(Market capitalization)	0.169	(5.92)	0.022	0.165	(5.83)	0.022	0.288	(15.50)	0.283	(15.15)
Institutional ownership	-0.127	(-0.99)	-0.017	-0.148	(-1.14)	-0.019	-0.239	(-1.09)	-0.262	(-1.12)
log(Book-to-market ratio)	0.074	(1.87)	0.010	0.076	(1.92)	0.010	0.104	(24.72)	0.106	(29.45)
Cash	-0.273	(-1.02)	-0.036	-0.256	(-0.97)	-0.034	-0.568	(-8.88)	-0.552	(-8.86)
Leverage	0.321	(1.62)	0.042	0.320	(1.61)	0.042	0.587	(2.25)	0.585	(2.24)
ROE	0.012	(0.23)	0.002	0.014	(0.26)	0.002	0.102	(0.55)	0.103	(0.58)
Growth of Sales	0.053	(0.32)	0.007	0.052	(0.31)	0.007	0.050	(0.70)	0.048	(0.72)
Term Spread	-0.066	(-0.45)	-0.009	-0.067	(-0.46)	-0.009	-0.119	(-0.62)	-0.119	(-0.62)
Credit Spread	0.190	(0.79)	0.025	0.189	(0.78)	0.025	0.316	(0.14)	0.314	(1.38)
Industry dummies		Y			Y			Y		Y
Yearly dummies		Y			Y			Y		Y
Clustering		Investor + Year			Investor + Year			Investor + Year		Investor + Year
N		98636			98636			98636		98636
Pseudo R ²		0.1906			0.1937			0.1528		0.1567

Table 5

Holdings of IPO bonds by firm's shareholders: aggregate level

We report the results of multivariate regressions of the relationship between pre-IPO habitual dual holder (HDH) equity ownership and post-IPO bond ownership by pre-IPO firm's shareholders. The dependent variable is the fraction of bond issue held by pre-IPO shareholders at the end of the quarter immediately after the IPO. We consider two measures of HDH ownership. HDHO-1 is defined as the dual-holding-propensity weighted institutional ownership. HDHO-2 is measured as the equity ownership by institutions with a dual holding propensity exceeding a threshold of 1/3. Additionally, we consider actual equity ownership by shareholders which purchased IPO bonds. Measures of HDH ownership are as of the closest end of the quarter preceding the IPO date by at least three months. All issuer characteristics are measured at the end of the previous calendar year. All variables are described in Appendix A. Standard errors are double-clustered at the industry (SIC2) and time (year) level.

	estimate	t-stat	estimate	t-stat	estimate	t-stat
HDHO-1	0.482	(2.19)				
HDHO-2			0.428	(1.81)		
Eq. own by shareholders buying bonds					0.264	(4.03)
log(Time to maturity)	-0.018	(-1.91)	-0.018	(-1.82)	-0.018	(-1.79)
log(Offering amount)	-0.023	(-1.84)	-0.024	(-2.03)	-0.034	(-2.99)
log(Market capitalization)	0.036	(5.16)	0.037	(5.55)	0.033	(3.92)
Institutional ownership	0.047	(2.35)	0.048	(2.38)	0.034	(1.84)
log(Book-to-market ratio)	-0.008	(-0.60)	-0.007	(-0.57)	-0.008	(-0.63)
Cash	-0.048	(-0.89)	-0.048	(-0.84)	-0.059	(-1.27)
Leverage	0.015	(0.55)	0.015	(0.61)	0.015	(0.68)
ROE	-0.003	(-0.36)	-0.004	(-0.49)	-0.004	(-0.38)
Growth of sales	-0.022	(-1.05)	-0.024	(-1.09)	-0.026	(-1.28)
Term spread	0.002	(0.12)	0.001	(0.05)	0.001	(0.07)
Credit spread	-0.013	(-0.68)	-0.012	(-0.57)	-0.016	(-0.85)
Change of Control dummy	0.001	(0.08)	0.001	(0.06)	0.001	(0.10)
Redeemable dummy	0.041	(2.12)	0.042	(2.19)	0.032	(1.80)
Global offer dummy	-0.016	(-0.87)	-0.019	(-1.04)	-0.019	(-1.05)
Junk bond dummy	-0.016	(-0.83)	-0.017	(-0.89)	-0.029	(-1.76)
Not rated bond dummy	-0.004	(-0.18)	-0.005	(-0.23)	-0.012	(-0.56)
Industry dummies	Y		Y		Y	
Yearly dummies	Y		Y		Y	
Clustering	Industry + Year		Industry + Year		Industry + Year	
N	383		383		383	
Adj R ²	0.4861		0.4976		0.5189	

Table 6

Holdings of IPO bonds by firm's shareholders: aggregate level — cross-sectional tests

We report the results of multivariate regressions of the relationship between pre-IPO habitual dual holder (HDH) equity ownership and post-IPO bond ownership by pre-IPO firm's shareholders by bond rating and conditional on economy-wide credit risk. The dependent variable is the fraction of bond issue held by pre-IPO shareholders at the end of the quarter immediately after the IPO. We consider two measures of HDH ownership. HDHO-1 is defined as the dual-holding-propensity weighted institutional ownership. HDHO-2 is measured as the equity ownership by institutions with a dual holding propensity exceeding a threshold of 1/3. Additionally, we consider actual equity ownership by shareholders which purchased IPO bonds. We split bond IPOs into investment grade rated and non-investment-grade / unrated subsamples. Panel A reports results for the two subsamples. In Panel B we additionally interact measures of HDH equity ownership with credit spread. Control variables are as in Table 5. Measures of HDH ownership are as of the closest end of the quarter removed from IPO date by at least three months. All issuer characteristics are measured at the end of the previous calendar year. All variables are described in Appendix A. Standard errors are double-clustered at the industry (SIC2) and time (year) level.

Panel A: by bond rating

	<u>Investment Grade</u>				<u>Non-Investment Grade and Unrated</u>			
	estimate	t-stat	estimate	t-stat	estimate	t-stat	estimate	t-stat
HDHO-1	-0.042	(-0.03)			0.511	(2.32)		
HDHO-2			0.200	(0.20)			0.485	(1.84)
Eq. own. by shareholders buying bonds					-0.056	(-0.35)		
Controls		Y		Y		Y		Y
Rating dummies		Y		Y		Y		Y
Industry dummies		Y		Y		Y		Y
Yearly dummies		Y		Y		Y		Y
Clustering		Industry + Year		Industry + Year		Industry + Year		Industry + Year
N		126		126		257		257
Adj R ²		0.6996		0.7001		0.5481		0.5558
				0.7000				0.5986

Panel B: conditional on macro credit risk

	<u>Investment Grade</u>				<u>Non-Investment Grade and Unrated</u>							
	estimate	t-stat	estimate	t-stat	estimate	t-stat	estimate	t-stat	estimate	t-stat	estimate	t-stat
HDHO-1	3.269	(0.62)					-1.815	(-1.74)				
HDHO-1 × Credit spread	-3.141	(-0.61)					2.051	(2.02)				
HDHO-2			-0.065	(-0.02)					-1.531	(-2.30)		
HDHO-2 × Credit spread			0.241	(0.09)					1.788	(2.87)		
Eq. own. by shareholders buying bonds					0.266	(1.05)					-0.310	(-1.79)
Eq. own. by shldrs × Credit spread					-0.282	(-1.05)					0.566	(3.63)
Credit spread	0.100	(0.31)	-0.089	(-0.59)	-0.045	(-0.49)	-0.132	(-12.41)	-0.125	(-6.08)	-0.128	(-8.39)
Controls		Y		Y		Y		Y		Y		Y
Rating dummies		Y		Y		Y		Y		Y		Y
Industry dummies		Y		Y		Y		Y		Y		Y
Yearly dummies		Y		Y		Y		Y		Y		Y
Clustering		Industry + Year		Industry + Year		Industry + Year		Industry + Year		Industry + Year		Industry + Year
N		126		126		126		257		257		257
Adj R ²		0.7026		0.7031		0.7027		0.5474		0.5553		0.5792

Table 7

Dual holder equity ownership of bond-IPO firms

We report the results of analysis of post-IPO dual holder equity ownership for bond IPO firms and for firms which have issued public bonds for some time. We consider two measures of dual holder equity ownership. DHEO-1 is the fraction of equity owned by shareholders which also hold bond stake in the company. DHEO-2 is defined likewise for non-IPO firms; for the IPO firms we calculate it as the fraction of equity owned by pre-IPO shareholders which remain with the company until that point and also hold bond stake in the company. We relate measures of dual holder equity ownership to a set of company characteristics and a dummy variable indicator which takes the value of one if a company undertook a bond IPO and zero otherwise. We perform this analysis for quarters one through five after the IPO. That is, for example, for quarter one analysis, each quarter we only keep firms which did bond IPO one quarter before (sample firms) and firms with public bonds which did bond IPO more than one quarter before (control firms). All variables are described in Appendix A. Standard errors are double-clustered at the industry (SIC2) and time (year) level.

Panel A: DHEO-1

	<u>Q1</u>		<u>Q2</u>		<u>Q3</u>		<u>Q4</u>		<u>Q5</u>	
	estimate	t-stat								
Bond IPO dummy	0.028	(4.68)	0.029	(5.50)	0.018	(3.36)	0.015	(3.01)	0.007	(1.48)
log(Market capitalization)	0.048	(55.29)	0.048	(55.23)	0.048	(55.11)	0.048	(55.02)	0.048	(55.03)
Institutional ownership	0.131	(20.50)	0.131	(20.41)	0.130	(20.38)	0.130	(20.35)	0.131	(20.39)
log(Book-to-market)	0.023	(13.76)	0.023	(13.84)	0.023	(13.73)	0.023	(13.75)	0.023	(13.81)
Cash	-0.033	(-4.29)	-0.033	(-4.29)	-0.033	(-4.32)	-0.033	(-4.29)	-0.034	(-4.31)
Leverage	0.175	(23.84)	0.175	(23.82)	0.175	(23.82)	0.175	(23.86)	0.176	(23.81)
Dividend yield	-0.625	(-9.15)	-0.626	(-9.18)	-0.631	(-9.17)	-0.630	(-9.17)	-0.631	(-9.18)
ROE	0.000	(-0.17)	0.000	(-0.15)	0.000	(-0.11)	0.000	(-0.12)	0.000	(-0.07)
Growth of Sales	0.005	(1.34)	0.005	(1.36)	0.005	(1.26)	0.005	(1.25)	0.005	(1.27)
Term spread	0.081	(12.04)	0.085	(12.01)	0.084	(12.38)	0.083	(12.27)	0.083	(12.20)
Credit spread	0.683	(16.63)	0.699	(16.59)	0.694	(16.15)	0.680	(16.75)	0.687	(16.49)
Industry dummies	Y		Y		Y		Y		Y	
Quarterly dummies	Y		Y		Y		Y		Y	
Clustering	Sic2 + Year									
N	50,428		50440		50444		50440		50443	
Pseudo R ²	0.9388		0.9387		0.9338		0.9378		0.9392	

Panel B: DHEO-2

	<u>Q1</u>		<u>Q2</u>		<u>Q3</u>		<u>Q4</u>		<u>Q5</u>	
	estimate	t-stat								
Bond IPO dummy	0.026	(4.37)	0.025	(4.66)	0.011	(1.97)	0.002	(0.46)	-0.006	(-1.09)
log(Market capitalization)	0.047	(52.06)	0.047	(51.96)	0.047	(51.91)	0.047	(51.85)	0.047	(51.78)
Institutional ownership	0.126	(20.08)	0.126	(20.05)	0.125	(20.00)	0.126	(19.98)	0.126	(19.98)
log(Book-to-market)	0.024	(14.36)	0.024	(14.44)	0.024	(14.32)	0.024	(14.37)	0.024	(14.41)
Cash	-0.011	(-1.40)	-0.011	(-1.40)	-0.011	(-1.42)	-0.011	(-1.39)	-0.011	(-1.42)
Leverage	0.153	(21.44)	0.153	(21.40)	0.153	(21.37)	0.153	(21.39)	0.153	(21.34)
Dividend yield	-0.461	(-6.68)	-0.462	(-6.70)	-0.469	(-6.75)	-0.467	(-6.73)	-0.466	(-6.70)
ROE	0.001	(0.50)	0.001	(0.52)	0.001	(0.56)	0.001	(0.58)	0.001	(0.64)
Growth of Sales	0.002	(0.56)	0.002	(0.60)	0.002	(0.49)	0.002	(0.45)	0.002	(0.45)
Term spread	0.071	(10.64)	0.073	(10.49)	0.072	(10.70)	0.071	(10.61)	0.071	(10.56)
Credit spread	0.599	(15.40)	0.615	(15.40)	0.607	(14.98)	0.596	(15.73)	0.601	(15.33)
Industry dummies	Y		Y		Y		Y		Y	
Quarterly dummies	Y		Y		Y		Y		Y	
Clustering	Sic2 + Year									
N	50,428				50440				50444	
Pseudo R ²	0.966				0.9665				0.9672	

Table 8

Habitual dual holder equity ownership and pricing of IPO bonds

We report the results of multivariate regressions of the relationship between pre-IPO habitual dual holder (HDH) equity ownership and bond IPO offering yield spreads. The dependent variable is the difference in annualized yield between IPO bond and Treasury bond of most similar maturity. We consider two measures of HDH ownership. HDHO-1 is defined as the dual-holding-propensity weighted institutional ownership. HDHO-2 is measured as the equity ownership by institutions with a dual holding propensity exceeding a threshold of 1/3. Measures of HDH ownership are as of the closest end of the quarter preceding the IPO date by at least three months. All issuer characteristics are measured at the end of the previous calendar year. All variables are described in Appendix A. Standard errors are double-clustered at the industry (SIC2) and time (year) level.

	estimate	t-stat	estimate	t-stat	estimate	t-stat	estimate	t-stat
HDHO-1	-15.203	(-4.84)			-12.776	(-2.98)		
HDHO-2			-11.012	(-2.52)			-9.085	(-2.05)
log(Time to maturity)	-0.353	(-1.81)	-0.389	(-1.95)	-0.386	(-2.29)	-0.420	(-2.38)
log(Par amount offered)	0.425	(2.61)	0.438	(2.66)	0.247	(1.50)	0.261	(1.50)
log(Market capitalization)	-1.114	(-8.04)	-1.137	(-8.29)	-0.769	(-5.08)	-0.792	(-5.06)
Institutional ownership	-0.199	(-0.53)	-0.369	(-1.08)	-0.276	(-0.69)	-0.409	(-1.11)
log(Book-to-market)	0.187	(1.49)	0.187	(1.43)	0.193	(1.34)	0.191	(1.40)
Cash	0.464	(0.69)	0.428	(0.65)	0.749	(1.66)	0.707	(1.63)
Leverage	0.616	(1.26)	0.667	(1.34)	0.257	(0.64)	0.276	(0.63)
ROE	-0.088	(-0.50)	-0.094	(-0.55)	-0.065	(-0.45)	-0.073	(-0.51)
Growth of Sales	0.123	(0.57)	0.180	(0.90)	0.016	(0.08)	0.061	(0.31)
Term spread	-0.452	(-1.66)	-0.431	(-1.59)	-0.484	(-2.08)	-0.470	(-2.00)
Credit spread	0.526	(0.98)	0.530	(1.00)	0.492	(1.22)	0.501	(1.26)
Change of control dummy					-0.558	(-1.84)	-0.562	(-1.81)
Redeemable dummy					0.435	(1.26)	0.431	(1.22)
Global offer dummy					-0.546	(-1.53)	-0.488	(-1.40)
Industry dummies	Y		Y		Y		Y	
Yearly dummies	Y		Y		Y		Y	
Rating dummies	N		N		Y		Y	
Clustering	Industry + Year							
N	514		514		514		514	
Adj R ²	0.7034		0.7023		0.7556		0.7557	

Table 9

Habitual dual holder equity ownership and pricing of IPO bonds — cross-sectional tests

We report the results of multivariate regressions of the relationship between pre-IPO habitual dual holder (HDH) equity ownership and bond IPO offering yield spreads by bond rating and conditional on economy-wide credit risk. The dependent variable is the difference in annualized yield between IPO bond and Treasury bond of most similar maturity. We consider two measures of HDH ownership. HDHO-1 is defined as the dual-holding-propensity weighted institutional ownership. HDHO-2 is measured as the equity ownership by institutions with a dual holding propensity exceeding a threshold of 1/3. We split bond IPOs into investment grade rated and non-investment-grade / unrated subsamples. Panel A reports results for the two subsamples. In Panel B we additionally interact measures of HDH equity ownership with credit spread. Control variables are as in Table 8. Measures of HDH ownership are as of the closest end of the quarter preceding the IPO date by at least three months. All issuer characteristics are measured at the end of the previous calendar year. All variables are described in Appendix A. Standard errors are double-clustered at the industry (SIC2) and time (year) level.

Panel A: by bond rating

	<u>Investment grade</u>				<u>Non-investment grade</u>			
	estimate	t-stat	estimate	t-stat	estimate	t-stat	estimate	t-stat
HDHO-1	-3.001	(-0.30)			-12.749	(-3.03)		
HDHO-2			-2.034	(-0.16)			-8.777	(-2.39)
Controls	Y		Y		Y		Y	
Industry dummies	Y		Y		Y		Y	
Yearly dummies	Y		Y		Y		Y	
Rating dummies	Y		Y		Y		Y	
Clustering	Industry + Year		Industry + Year		Industry + Year		Industry + Year	
N	148		148		366		366	
Adj R ²	0.8467		0.8464		0.7219		0.7204	

Panel B: conditional on macro credit risk

	<u>Investment grade</u>				<u>Non-investment grade</u>			
	estimate	t-stat	estimate	t-stat	estimate	t-stat	estimate	t-stat
HDHO-1	-10.001	(-0.28)			14.472	(1.11)		
HDHO-1 × Credit spread	6.815	(0.22)			-24.660	(-2.12)		
HDHO-2			-17.071	(-0.64)			14.143	(1.19)
HDHO-2 × Credit spread			14.585	(0.75)			-21.759	(-2.06)
Credit spread	-0.427	(-0.23)	-0.723	(-0.62)	1.760	(2.01)	1.759	(2.00)
Controls	Y		Y		Y		Y	
Industry dummies	Y		Y		Y		Y	
Yearly dummies	Y		Y		Y		Y	
Rating dummies	Y		Y		Y		Y	
Clustering	Industry + Year		Industry + Year		Industry + Year		Industry + Year	
N	148		148		366		366	
Adj R ²	0.8471		0.8480		0.7252		0.7238	

Table 10

Habitual dual holder equity ownership and the decision to undertake bond IPO

We report the results of multivariate regressions of the relationship between pre-IPO habitual dual holder (HDH) equity ownership and the firm's decision to undertake a bond IPO. Each quarter we consider all non-financial / non-utility COMPUSTAT firms which do not have public bonds outstanding. In Specifications 1 and 2 (3 and 4) the dependent variable takes the value of one, if the firm issued public bonds for the first time on some date between three and six months (nine and twelve months) in the future, zero otherwise. We consider two measures of HDH ownership. HDHO-1 is defined as the dual-holding-propensity weighted institutional ownership. HDHO-2 is measured as the equity ownership by institutions with a dual holding propensity exceeding a threshold of 1/3. All issuer characteristics are measured at the end of the previous calendar year. All variables are described in Appendix A. Standard errors are double-clustered at the industry (SIC2) and time (year) level.

	<u>HDH ownership at Q_{t-1}</u>						<u>HDH ownership at Q_{t-4}</u>					
	estimate	(1) t-stat	ME	estimate	(2) t-stat	ME	estimate	(3) t-stat	ME	estimate	(4) t-stat	ME
HDHO-1	2.998	(3.46)	1.168				4.848	(5.36)	1.717			
HDHO-2				1.778	(3.58)	0.697				2.921	(5.40)	1.046
log(Market capitalization)	0.174	(12.48)	0.068	0.179	(13.25)	0.070	0.165	(10.79)	0.058	0.173	(11.56)	0.062
Institutional ownership	0.111	(1.15)	0.043	0.174	(1.97)	0.068	0.069	(0.67)	0.024	0.172	(1.86)	0.062
log(Book-to-market)	0.146	(4.92)	0.057	0.145	(4.89)	0.057	0.103	(3.85)	0.036	0.102	(3.83)	0.037
Cash	-0.982	(-5.51)	-0.382	-0.974	(-5.50)	-0.382	-0.962	(-6.07)	-0.341	-0.947	(-6.03)	-0.339
Leverage	0.691	(7.01)	0.269	0.695	(7.09)	0.272	0.711	(7.30)	0.252	0.719	(7.41)	0.258
Dividend yield	-1.303	(-1.09)	-0.507	-1.457	(-1.21)	-0.571	-1.605	(-1.30)	-0.568	-1.936	(-1.54)	-0.693
ROE	-0.054	(-1.67)	-0.021	-0.054	(-1.69)	-0.021	-0.054	(-1.63)	-0.019	-0.054	(-1.64)	-0.019
Growth of Sales	0.001	(0.01)	0.000	-0.001	(-0.01)	0.000	-0.003	(-0.04)	-0.001	-0.001	(-0.01)	0.000
Interest rate coverage	0.000	(0.52)	0.000	0.000	(0.58)	0.000	0.000	(1.97)	0.000	0.000	(2.03)	0.000
Term spread	-0.803	(-1.44)	-0.313	-0.812	(-1.45)	-0.319	-0.277	(-0.71)	-0.098	-0.274	(-0.71)	-0.098
Credit spread	-1.550	(-1.35)	-0.604	-1.497	(-1.32)	-0.587	-0.023	(-0.05)	-0.008	0.015	(0.03)	0.005
Industry dummies		Y			Y			Y			Y	
Quarter dummies		Y			Y			Y			Y	
Clustering		Industry + Year			Industry + Year			Industry + Year			Industry + Year	
N		108250			108250			105023			105023	
Pseudo R ²		0.1401			0.1397			0.1439			0.1430	

Table 11

Instrumenting habitual dual holder equity ownership

We report the results of instrumental regressions of dual holder equity ownership. We consider two measures of HDH ownership. HDHO-1 is defined as the dual-holding-propensity weighted institutional ownership. HDHO-2 is measured as the equity ownership by institutions with a dual holding propensity exceeding a threshold of 1/3. We use two instrumental variables: Amihud's stock liquidity and the inverse of price per share of a stock. All company characteristics are measured at the end of the previous calendar year. All variables are described in Appendix A. Standard errors are double-clustered at the industry (SIC2) and time (year) level. F-test for the joint significance of the instruments is reported as well.

	<u>HDHO-1</u>		<u>HDHO-2</u>	
	estimate	t-stat	estimate	t-stat
Amihud	-0.036	(-2.12)	-0.077	(-1.91)
1/Price	-0.022	(-6.73)	-0.012	(-2.91)
log(Market capitalization)	0.003	(24.33)	0.002	(9.73)
Institutional ownership	0.041	(36.10)	0.035	(19.65)
log(Book-to-market)	0.000	(-2.88)	-0.001	(-2.15)
Cash	0.000	(0.19)	-0.002	(-1.35)
Leverage	0.001	(0.88)	0.000	(-0.34)
Dividend yield	-0.090	(-11.68)	-0.079	(-7.53)
ROE	-0.001	(-3.22)	0.000	(-0.64)
Growth of Sales	-0.001	(-3.44)	-0.001	(-2.33)
Interest rate coverage	0.007	(1.42)	0.013	(0.97)
Term spread	-0.005	(-1.13)	-0.010	(-1.02)
Industry dummies	Yes		Yes	
Quarterly dummies	Yes		Yes	
Clustering	Industry + Year		Industry + Year	
N	88,994		88,994	
Adj R ²	0.5076		0.425	
F-test (instruments)	25.65		8.05	
	(0.01)		(0.01)	

Table 12

Holdings of IPO bonds by firm's shareholders and IPO offering spreads: instrumented measures of habitual dual holder equity ownership.

We report the results of multivariate regressions of the relationship between instrumented measures of pre-IPO habitual dual holder (HDH) equity ownership, post-IPO bond ownership by pre-IPO firm's shareholders, and bond IPO offering spreads. Instrumented measures of HDH ownership are derived from analysis reported in Table 11. In Specifications 1 and 2 the dependent variable is the fraction of bond issue held by pre-IPO shareholders at the end of the quarter immediately after the IPO. In Specifications 3 and 4 the dependent variable is the difference in annualized yield between IPO bond and Treasury bond of most similar maturity. Instrumented measures of HDH ownership are as of the closest end of the quarter preceding the IPO date by at least three months. All issuer characteristics are measured at the end of the previous calendar year. All variables are described in Appendix A. Standard errors are double-clustered at the industry (SIC2) and time (year) level. Hansen's test of overidentification of instrumental variables is reported as well.

	<u>Fraction of bond issue owned by pre-IPO shareholders after the bond IPO</u>				<u>Bond IPO offering spread</u>			
	estimate	t-stat	estimate	t-stat	estimate	t-stat	estimate	t-stat
HDHO-1 (instr.)	2.102	(2.69)			-70.797	(-2.53)		
HDHO-2 (instr.)			2.845	(2.25)			-60.945	(-2.29)
log(Market capitalization)	-0.023	(-2.16)	-0.021	(-1.69)	-0.311	(-1.68)	-0.486	(-2.65)
Institutional ownership	-0.020	(-2.01)	-0.025	(-2.14)	0.121	(0.66)	0.169	(0.78)
log(Book-to-market)	0.001	(0.07)	0.000	(0.01)	-0.623	(-4.30)	-0.691	(-4.90)
Cash	0.048	(2.12)	0.066	(2.25)	1.990	(1.58)	1.761	(1.38)
Leverage	-0.014	(-1.03)	-0.036	(-1.85)	0.000	(0.00)	-0.051	(-0.26)
Dividend yield	-0.004	(-0.31)	-0.010	(-0.59)	1.529	(1.76)	1.261	(1.45)
ROE	0.000	(-0.01)	-0.008	(-0.47)	1.394	(1.99)	1.792	(2.01)
Growth of Sales	0.032	(5.85)	0.036	(5.69)	0.097	(0.44)	0.103	(0.42)
Interest rate coverage	-0.016	(-0.42)	-0.060	(-0.99)	0.092	(0.19)	0.418	(0.77)
Term spread	-0.011	(-1.33)	-0.005	(-0.49)	-0.499	(-1.62)	-0.409	(-1.37)
log(Market capitalization)	-0.078	(-1.99)	-0.094	(-1.91)	0.025	(0.05)	0.008	(0.01)
Change of control dummy	-0.035	(-1.12)	-0.055	(-1.33)	-0.168	(-0.55)	-0.138	(-0.47)
Redeemable dummy	-0.004	(-0.33)	-0.017	(-1.05)	0.085	(0.17)	-0.158	(-0.28)
Global offer dummy	-0.026	(-1.33)	-0.036	(-1.54)	-0.465	(-1.48)	-0.155	(-0.46)
Junk	-0.005	(-0.38)	-0.010	(-0.68)				
Not Graded	0.003	(0.14)	0.013	(0.42)				
Rating dummies		N		N		Y		Y
Industry dummies		Y		Y		Y		Y
Yearly dummies		Y		Y		Y		Y
Clustering		Y		Y		Y		Y
		Industry + Year		Industry + Year		Industry + Year		Industry + Year
N		383		383		536		536
Adj R ²		0.4376		0.2029		0.5804		0.5233
Hansen (overidentification)		2.23		1.62		1.63		1.74
		(0.14)		(0.21)		(0.19)		(0.18)