

# Capital-structure changes around IPOs

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## **Abstract**

This paper investigates capital-structure changes around Initial Public Offerings (IPOs). We show that the magnitude and persistence of leverage reductions among IPO firms are sensitive to sample selection, the time period studied and how preferred shares are treated in computing pre-IPO leverage. Using a broader sample of IPOs and treating preferred stock as equity, we find little evidence of transitory market timing effects on leverage in hot-issue markets.

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## Introduction

How does capital structure change when firms go public? To what extent are initial public offerings associated with transitory changes in leverage driven by market conditions as opposed to permanent capital structure changes? These questions have motivated recent empirical studies focused on capital structure changes around initial public offerings (IPOs). For example, Lemmon et al. (2008) and Baker and Wurgler (2002) look at capital structure choices beginning when firms go public to investigate the nature and persistence of target leverage ratios, and they find considerable persistence in the *relative* amounts of leverage after firms go public (see Lemmon et al., 2008). In contrast, Alti (2006) examines leverage changes at the time of the IPO to draw inferences concerning management's valuation of the firm, and he finds a significant transitory drop in leverage for firms that go public in hot-issue markets. Alti interprets the transitory decline in leverage as evidence of market timing in hot-issue markets.

In our paper we take a closer look at changes in capital structure around IPOs. Our objective is to investigate the relation between pre-IPO financing and the magnitude and persistence of leverage changes associated with IPOs. Our paper documents that prior findings of transitory declines in leverage during "hot-issue" markets are sensitive to how leverage is defined, to the sample period, and to the sample selection criteria. Using a broader sample of IPOs, we find little evidence of transitory declines in leverage in hot-issue markets.

We begin by pointing out some unique aspects of the capital structure of IPO firms.<sup>1</sup> One prominent aspect of the capital structure of IPO firms is the widespread use of preferred stock financing before firms go public. In our sample (1975-2009), over 45% of IPO firms had

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<sup>1</sup> Welch (2011) compares issuing activity and capital structure changes in a sample of public firms. He finds that public firms that issue equity also increase their leverage ratio in the year of issuance.

preferred stock outstanding in the year before they went public. For those firms, the book value of preferred stock averaged about 75% of the book value of assets. The importance of preferred-share financing has grown over time—after 1995, over 60% of IPO firms had preferred stock outstanding at the time they went public. We document that IPO firms with preferred stock differed in terms of their debt capacity from publicly traded firms with preferred stock. IPO firms with preferred shares had low earnings, high cash-burn rates, relatively few tangible assets, and they invested heavily in research and development (R&D). Due to a history of losses (caused by the expensing of R&D) most IPO firms with preferred stock had negative book equity in the year prior to their IPO.

As is typically done in the empirical capital-structure literature, studies of leverage changes around IPOs generally exclude firms with leverage outside the unit interval (see for example Alti (2006) and Baker and Wurgler (2002)). This restriction is of little consequence for empirical studies of established publicly traded firms, but it has a significant effect on the composition of the sample of IPO firms. There are two reasons: first, most IPO firms with preferred stock have negative values of book equity when they go public. Second, previous studies of capital-structure changes around IPOs have typically treated preferred shares as debt when computing leverage (see Alti (2006), Baker and Wurgler (2002) and Kayhan and Titman (2007)). The combination of negative book equity and the classification of preferred stock as debt results in many firms with preferred stock having leverage ratios that fall outside the unit interval. Excluding firms with leverage outside the unit interval leads to a sample of IPO firms that is skewed towards older more profitable firms that are more reliant on debt financing.

The case of Netflix's IPO in May of 2002 illustrates these issues. At the end of December 2001, Netflix had \$6.8 million in total debt, \$102 million in convertible preferred stock

outstanding and \$42 million in assets. Owing to a history of losses, Netflix had a stockholder's deficit of about \$90 million. The large shareholder deficit resulted in pre-IPO leverage that was outside the unit interval. As part of its IPO, Netflix raised \$75 million in new funding, paid off \$3 million in debt and, because of a mandatory conversion requirement, converted all of its preferred stock into common stock. If, as is typically done, preferred stock is treated as debt, Netflix pre-IPO leverage  $[(6.8+102)/42]$  would have been 259%, dropping to 1.32% due to the IPO (and owing largely to the conversion of preferred shares). Defining leverage as the ratio of short-term debt plus long-term debt to total assets would have resulted in a more modest drop in leverage for Netflix from 16.2% to 1.32% immediately after the IPO.

One implication of excluding firms such as Netflix from the sample is that many young firms that rely on staged financing prior to going public are not included in the sample of IPOs. Consequently, the sample of IPO firms in Altı (2006) consisted of firms that were more reliant on debt than IPO firms more generally. One might argue that treating preferred as debt and restricting the sample to older firms results in a sample of firms for which there is a meaningful choice between debt and equity, and thus a sample of IPOs for which market timing is a relatively more important component of leverage choice.<sup>2</sup> However, restricting the sample to more debt-dependent firms raises the question of whether the timing of the decision to go public for these firms was related to aggregate variables such as credit market conditions.

We first investigate the extent to which IPO proceeds are affected by market timing as described in Altı (2006). He attempts to identify market-timing effects on capital structure by showing transitory declines in leverage during hot-issue markets. He defines hot-issue markets as

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<sup>2</sup> This is a caveat that is too easily forgotten- the results in Altı (2006) were limited to a specific type of IPO.

periods with greater than the median IPO activity. Hot-issue markets are assumed to capture market-timing behavior if the amount of equity firms raised is greater during hot-issue markets. We replicate his tests and find that the effect of hot-issue markets on leverage is only present for firms that do not have preferred shares prior to going public and only when proxies for credit market conditions are not included in the empirical model. For example, we find that the coefficient on HOT, (a dummy variable for hot-issue markets), equals 10.3 (with a t-statistic of 7.75) using Alti's sample period. When we extend the sample period to 2009, permit the inclusion of firms with preferred shares that have leverage outside of the unit interval, and control for credit spreads at the time of the IPO, this coefficient falls to 0.84 (t-statistic of 0.68). Moreover, even without controls for credit market conditions, we find evidence of transitory market timing effects only during the first part of Alti's (2006) sample (1975-1985). Specifically, for the 1986-2009 sub-period, the coefficient on HOT in Alti's IPO proceeds regression equals 0.12 (t-statistic of 0.08). Summarizing our main result, transitory timing disappears for the broader sample of firms when controlling for credit spreads at the time of issuance.

We contribute to the literature on capital structure changes around IPOs in several ways. First, we show that the determinants of preferred stock financing are different for IPO firms than for established publicly traded firms. Specifically, IPO firms that rely on preferred stock typically have little in the way of debt capacity. In contrast, publicly traded firms that issue preferred stock also rely heavily on debt financing. Second, we show that sample selection criteria that are widely used in empirical capital-structure studies can matter more when studying capital-structure changes around IPOs. Third, we show that prior findings of transitory declines in leverage during hot-issues markets are not robust. On the whole, IPO firms do not seem to issue opportunistically to reduce their debt burden.

## 1. Background: Use of preferred stock by start-up and public companies

While there is very little research on the use of preferred stock by publicly traded companies, most corporate finance texts consider preferred stock a close substitute for subordinated debt financing.<sup>3</sup> The rationale for this treatment is that preferred stock has a liquidation preference over common stock, and as Ross, Westerfield and Jaffe (2010) explain, preferred stock is probably more similar to debt than to common stock due to the constant dividend rate associated with preferred stock of public companies. The close resemblance to debt financing motivates the classification of preferred as debt in the empirical studies on capital structure discussed earlier.

Classifying preferred stock as debt is misleading for IPO firms, however. Specifically, while the preferred stock issued by start-up companies typically has a liquidation preference over common equity, the reasons for preferred stock financing by start-ups appear to be different than the reasons public firms issue preferred stock. For most start-up firms, preferred stock is not a close substitute for debt financing. The use of preferred by start-ups is typically explained in the context of staged financing (see Sahlman (1988, 1990) and Gompers (1995)). When investments are staged, capital is provided sequentially conditional on performance since the previous stage. One form of staged financing that is common among start-up companies involves the use of convertible claims, typically preferred stock that also has voting power (see Hertz et al. (2012), Kaplan and Stromberg (2003) and Metrick and Yasuda (2011) for further details). As Hellmann (2006) and Mayers (1998) explain, the conversion feature is attractive because if the project (or start-up) is successful, conversion occurs, which in turn frees up additional cash, and provides a

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<sup>3</sup> The use of preferred by financial firms and utilities is typically explained in terms of favorable regulatory treatment (see Smart, Megginson and Gitman (2008)).

readymade exit mechanism for early-round investors. An important advantage of convertible preferred stock over straight equity is that it provides investors with a liquidation preference while preserving the entrepreneur's incentive to exert effort. Preferred stock also facilitates staging by allowing the start-up to vary the liquidation preference or other contract features by financing round.<sup>4</sup>

Previous studies suggest that firm characteristics related to preferred stock for private firms (such as high levels of R&D and investments in intangible assets) are characteristics that are typically associated with low leverage.<sup>5</sup> We also find that IPO firms that rely on preferred stock have higher levels of R&D spending, high cash-burn rates, and use less debt than IPO firms that do not have preferred shares outstanding. Because R&D is expensed for accounting purposes, firms with preferred stock typically have a history of significant losses and significant negative book equity. To summarize, previous theoretical and empirical studies suggest that convertible preferred stock is an important aspect of the staged financing of many start-up firms.

The rationale for the use of preferred shares by start-ups and the characteristics of IPO firms that use preferred stock have at least two important implications for studying leverage changes around IPOs. First, as discussed in the introduction, restricting leverage to the unit interval is likely to exclude a significant number of IPO firms that rely on preferred stock.

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<sup>4</sup> Gilson and Schizer (2003) provide a tax based argument for the use of convertible stock by start-up companies. They argue that preferred stock facilitates favorable tax treatment for common stock held by founders and senior management of a startup. The idea is that managers (and founders) of cash strapped start-ups receive a significant amount of their compensation in the form of common stock (so called founder stock) at each round of financing. Under U.S. tax law the value of the stock at the grant date is treated as ordinary income and taxed at a higher rate than capital gains. Thus managers have an incentive to understate the value of the common stock at the grant date as a way of deferring taxes and to convert ordinary income into capital gains. However, when seeking external financing, the original owners obviously want to obtain the highest price possible for any shares issued to outsiders. Preferred stock provides a mechanism to decouple for tax purpose the value of the common stock (used to compensate managers) from the value of equity to outsiders.

<sup>5</sup> See Rajan and Zingales (1995) and Titman and Wessels (1988).



Second, the IPO firms that pass the unit-interval leverage restriction are more likely to rely on debt financing, and thus the timing of their IPOs is likely to be more sensitive to credit market conditions than for IPO firms generally. We investigate these issues and the role of hot-issue markets in sections 3 and 4.

## **2. Data**

Our sample consists of initial public offerings (IPOs) that occur between 1975 and 2009. The sample of IPOs and information on the IPOs was obtained from Jay Ritter's IPO database.<sup>6</sup> We end the sample in 2009 in order to track post-IPO issuance for two years following the IPO. Our sample is restricted to firms for which the offer price exceeds \$5.00 per share. We exclude utility firms (SIC 4900-4999) and financial firms (SIC 6000 -6999) as well as American Depositary Receipts, closed-end funds, unit IPOs, limited partnerships, spinoffs and REITs. This sample of firms is matched to stock price data from CRSP and accounting data from COMPUSTAT with the restriction that all of the firms have accounting data on book assets and liabilities in both the year before and the year of the IPO. For most firms, COMPUSTAT does not provide accounting information going back more than one year before the IPO. Firms are included in the sample until the first year in which they exit COMPUSTAT. We exclude observations with missing sales or that have less than \$10 million (in 2011 dollars) in book assets in the IPO year. These steps yield a set of 3,875 IPOs. Further details are provided in the Data Appendix.

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<sup>6</sup> A description of how the sample was constructed can be found in Loughran and Ritter (2004) and on Jay Ritter's website. The database is based on the SDC IPO dataset, but with thousands of corrections and filling in of missing observations.

Prior studies of leverage changes around IPOs such as Baker and Wurgler (2002) and Altı (2006) treat preferred stock as a debt claim in their definition of leverage. However, using this definition of leverage and restricting leverage to be in the unit interval excludes a large fraction of firms that have preferred shares and a history of losses prior to going public. More specifically, treating preferred shares as a debt claim and requiring leverage to be less than or equal to 100% would exclude 1,151 firms, or 30% of our sample. Of the firms that would be excluded, 89% have pre-IPO preferred shares.

Because of mandatory conversion features of preferred shares, over 90% of firms with pre-IPO preferred shares convert their preferred shares into equity at the time they go public (Kaplan and Stromberg 2003). Based on this feature of convertible stock, preferred shares are classified as an equity claim in our definition of leverage. Firms with values of this leverage ratio greater than 100% in the year prior to going public are included in the sample only if they have preferred stock in their pre-IPO capital structure.<sup>7</sup>

The COMPUSTAT database does not provide information on the conversion of preferred stock. To determine whether the reduction of preferred shares outstanding results from conversion (as opposed to the shares being repurchased or redeemed) we read the offering prospectuses in a hand-collected subsample of 500 firms. This sample is created by randomly selecting (with stratification by year) firms going public between 1997 and 2009 that had preferred stock prior to going public ( we start this subsample in 1997 because that is the first full year for which offer prospectuses in electronic format on the SEC website). The offering

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<sup>7</sup> We exclude firms for which book leverage, defined as short term plus long term debt relative to assets, is outside the unit interval only if they do not have preferred stock. We exclude these firms in order to maintain comparability with earlier studies that use this definition and to minimize the effect of outliers on our results. See for example, Hovakimian et al. (2001), and Lemmon et al. (2008).

prospectus of these firms provides a pro-forma analysis of the effect of the IPO proceeds on the firm's capital structure. In every one of the sampled prospectuses, the pro-forma reduction in preferred shares occurs because of conversion.

## 2.1 Summary statistics

Table 1 provides summary statistics for the firms in our sample. All financial information is for the year end prior to the firm's IPO. To illustrate how excluding firms with leverage greater than 100% affects the types of IPO firms that are included in the sample, we report summary statistics for the entire sample and for the sample of firms that have preferred shares prior to going public.

Table 1 reveals a number of significant differences between firms with and without preferred shares. Firms with preferred shares have lower leverage but, as shown, leverage is much higher for this group if preferred stock is treated as debt in the leverage measure.<sup>8</sup> When leverage is defined as in Altı (2006) (indicated as LEVPF in Table 1), the pre-IPO mean and median leverage of firms with preferred exceeds that of firms without preferred shares. Firms with preferred shares are also significantly younger (12.9 vs. 17.4 years, t-stat for difference = 7.6), less profitable (-0.3% EBITDA/A vs. 19.6%, t-stat for difference = 23.8), have fewer tangible assets (PPE/Assets is 22.8% vs. 28.6% t-stat for difference = 8.5) and invest more in R&D (mean RD/Assets of 14.9% vs. 5.1%, t-stat for difference = -20.6). More important, over half (58%) of the firms with pre-IPO preferred stock have negative book equity in the year before they go public compared to only 6 percent of other IPO firms. This fact explains why

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<sup>8</sup> We divide financial debt by book assets in order to remain consistent with the capital structure literature. A more appropriate measure would be to use the ratio of financial debt to the sum of financial debt plus equity (see Welch 2011).

most firms with preferred stock are excluded from the sample when debt is defined to include preferred stock and leverage is restricted to the unit interval.

As shown in Table 1, firms with preferred shares raise more capital in their IPOs, belong to industries with high average market-to-book ratios, are more likely to be in the technology industry (TECH), and are more likely to be backed by professionally managed private equity firms (venture, growth- capital or other private equity firms)—what we refer to as institutional backing (INST). Firms with preferred stock also have, on average, lower earnings and a negative interest coverage ratio, suggesting limited debt capacity compared with firms that do not have preferred shares. The latter group of firms has a median interest coverage ratio of 5.8 compared with only 2.3 for firms with preferred shares. Finally, consistent with more value arising from growth options, the stock based component of compensation is significantly greater for firms with preferred shares.<sup>9</sup>

Firms with preferred shares also appear to have a greater need for near-term financing immediately prior to their IPO. We compare internal resources with investment expenditures using the dollar- and cash-burn rates.<sup>10</sup> As shown in Table 1, the average dollar burn rate for firms with preferred shares is \$4.5 million compared to -\$1.4 million for firms without preferred shares. Firms with preferred shares also have higher cash burn rates (8.8% vs. -0.3%, t-stat for difference = -3.3). In fact, the median firm without preferred shares has a negative cash burn rate,

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<sup>9</sup> Most of the differences we observe in Table 1 persist after controlling for institutional backing.

<sup>10</sup> The dollar burn rate is calculated as the difference between funds used for investment by a firm and the funds it generates from operations in the year prior to the IPO (see Hertz et al. (2012)).  $Dollar\ burn\ rate = CAPX - (OIBDP - TXT - XINT)$  where CAPX is capital expenditures, OIBDP is operating income before depreciation, TXT and XINT equal total taxes paid and interest expense, respectively. The cash burn rate is defined as the ratio of the dollar burn rate to total IPO proceeds. Note that our measure of the dollar burn rate includes R&D expense because operating income is net of R&D.

indicating that capital expenditures and R&D are less than internally generated funds in the year prior to going public (i.e. they have positive free cash flow).

The characteristics of firms going public during the time period covered by Alti's (2006) sample are quite similar to those of firms in the broader sample period. Summary statistics for the time period that overlaps with Alti's sample are reported in the Internet Appendix. Overall, we find that among firms with and without preferred stock, the mean and median leverage ratios (LEV) are virtually identical during Alti's sample and our sample. Firm age and the proportion of tech firms are also quite similar across the two samples as well.<sup>11</sup>

Summarizing the results of this section, the significantly lower leverage and much higher financing needs relative to internal resources of firms with pre-IPO preferred suggests that the factors affecting the timing of their IPO and leverage changes following their IPO may differ from firms without preferred financing. We investigate these issues in Section 3.

## **2.2 Differences between public and private firms that use preferred stock**

At this point, a natural question to ask is whether the same factors associated with the use of preferred shares by IPO firms are associated with the use of preferred shares by established publicly traded firms. If so, treating preferred shares as debt when computing leverage might be justified as a way of comparing the determinants of capital structure of IPO firms to those of seasoned publicly traded firms. We address this question in two ways. First, we compare IPO firms to public firms based on whether or not they have preferred stock outstanding. The sample of public firms consists of the universe of publicly traded firms in

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<sup>11</sup> As discussed later, we examine evidence of market timing during the 1986 through 2009 sub-period. Comparing the firm characteristics in the 1975 to 1985 time period to those in 1986-2009 yields results similar to those discussed in the text.

COMPUSTAT from 1975 to 2009 that are not financial institutions or regulated utilities. We exclude financial institutions and regulated utilities because favorable regulatory treatment motivates the use of preferred shares by these types of firms.<sup>12</sup> We compute summary statistics for these firms in the third year they appear in COMPUSTAT.<sup>13</sup> The problem with this comparison is that the preferred stock for these firms may be non-converted preferred stock that was issued when these firms were private. Therefore, our second approach is to compare the characteristics of industrial firms that issue preferred stock to firms issuing common stock or debt in the same year.

Panel A of Table 2 shows that, for publicly traded firms, the characteristics associated with the use of preferred financing are very different than the characteristics associated with preferred financing among IPO firms. For example, public firms with preferred shares on average use more debt, have more tangible assets, spend less on R&D, and have lower market-to-book ratios than firms with no preferred stock outstanding. Indeed, unlike IPO firms, public firms that use preferred shares have characteristics that are typically associated with greater leverage and higher debt capacity (see for example Lemmon et al., 2008), which is why preferred shares are typically considered a close substitute for debt financing.

We also compare public firms that issue preferred shares to public firms that issue debt or have seasoned equity offerings. For this analysis we focus on issuance of preferred or convertible preferred but exclude Trust-Preferred issues since these types of issues have features that allow these instrument to be treated as debt for tax purposes.<sup>14</sup> Our sample consists of issuance activity reported in SDC Platinum Edition between 1987 and 2009. As shown in panel B of Table 2,

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<sup>12</sup> See “The ABCs of U.S. Preferreds” by Kevin J. Horan, S&P Dow Jones Indices Practice Essentials.

<sup>13</sup> The comparison is robust to using every firm-year for the public-firm sample.

<sup>14</sup> See Ross, Westfield and Jaffe (2010).

issuance of preferred stock by publicly traded industrial firms is a rarity: there are only 111 preferred stock issues by COMPUSTAT-listed industrial firms over the span of 22 years-- compared to 4,957 seasoned equity offerings and 8,343 debt issues during this period. Preferred issuers are on average more highly levered, have more tangible assets (measured with PPE/A), and are larger than firms that issue common stock. Preferred-stock issuers are similar in size and asset tangibility to debt issuers and the market-to-book ratio of preferred stock issuers is closer in magnitude to that of debt issuers than it is to the market-to-book ratio of seasoned equity issuers.<sup>15</sup> These findings are consistent with the widely held view that for public firms, preferred stock is a close substitute for debt financing.

### **3. Leverage changes around IPOs**

We next investigate leverage changes around the IPO. We follow the typical practice in reporting longitudinal evidence and report averages conditional on firms remaining in the COMPUSTAT database. In event year +5, for example, firms that were acquired, went private, or no longer reported financial statements following financial distress are not included if such events occur before year +5. In addition, we also examine leverage changes for a random sample of 500 IPO firms for the three years prior to the IPO to 5 years after the IPO. We obtain information on pre-IPO leverage for 363 of these firms from the offering prospectus.

Panel A of Table 3 reports leverage ratios from the year preceding the IPO to 5 years after the IPO based on the pre-IPO use of preferred stock. As shown, both groups of firms use a considerable amount of debt in the year before they go public. However, both before and after

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<sup>15</sup> In unreported tests, we confirm these results in a multivariate setting. These results are available upon request.

the IPO firms without preferred stock have significantly greater leverage than firms that have pre-IPO preferred stock in their capital structure.

The IPO is associated with a permanent decline in average and median leverage for both groups of firms. While the proportional decline (defined as  $(LEV_t - LEV_{ipo-1}) / LEV_{ipo-1}$ ) in average leverage reported in Panel B is similar for both groups in the IPO year (52% and 55% for firms with and without preferred, respectively), the decline for the median firms with preferred shares is much greater and more persistent than for firms without preferred. For example, in the IPO year, leverage for the median firm with preferred shares declines by 84% compared to 70% for firms without preferred. Five years after the IPO, the leverage of the median firm with preferred shares is less than 44% of its pre-IPO leverage. In contrast, leverage for the median firm without preferred shares is 59% of its pre-IPO level.

For firms without pre-IPO preferred stock, we find some evidence of a transitory decline in average leverage immediately following the IPO. The primary reason for this finding is that these firms issue significant amounts of debt in the two years following the IPO (in unreported tests we find significant differences in the likelihood of issuing debt following the IPO between the two types of firms). While firms with preferred shares also issue some debt immediately after the IPO, we find no increase in the use of debt by these firms during the years after they go public. This finding implies a greater proportional decline in leverage for firms that have pre-IPO preferred shares. It is also the case that pre-IPO leverage in the hand-collected sample is high up to three years prior to going public, indicating that the IPO-year decline in leverage reflects a permanent change in the firm's capital structure.

#### **4. Hot-issue markets and leverage changes around the IPO**



Perhaps the most widely cited evidence of transitory effects of market timing on capital structure is Alti's (2006) comparison of leverage changes in hot- and cold-issue IPO markets. As discussed in the introduction, Alti attempts to identify market timing effects by linking the IPO proceeds to whether the IPO market is hot or cold at the time of the offering. The basic idea is that if hot issues markets are perceived by issuers as windows of opportunity in which the cost of equity financing is low then one would expect issue proceeds to be larger during hot-issue markets. His principal finding is to show that hot-issue markets are associated with a large but temporary decline in leverage.

As shown in Table 1, by excluding most firms with preferred shares, Alti's sample consists of a sample that is skewed towards more debt-dependent firms. We conjecture that the timing of the IPO for these firms will be much more sensitive to credit market conditions than for the typical IPO firms. Because they have the capacity to issue debt, firms without preferred shares may base the timing of their decision to go public by comparing the cost of issuing equity with the cost of issuing debt. We test this hypothesis in the context of Alti's IPO proceeds and leverage regressions with a measure of credit conditions based on the difference in long-term borrowing costs between low- and high- quality bond issuers.

#### **4.1 Market-timing and capital structure**

We identify hot-issue IPO markets with the same methodology as Alti (2006). Specifically, HOT is defined by whether IPO volume (measured by the number of firms going public in a given month) is greater than the median IPO volume over the sample period, and the volume measure is based on the three-month centered average of the number of firms going public. We then run the following regression.

$$\frac{Proceeds}{A_t} = \alpha + \beta HOT_{ipo} + \gamma Default_{ipo-1} + \delta X_{i\ ipo-1} + \varepsilon_{it} \quad (1)$$

where *Proceeds* equals total IPO proceeds and  $A_t$  equals total assets at the end of the IPO year. Credit market conditions are measured with *Default* which equals the difference between 30Y BBB-rated bonds and AAA rated bonds provided by Moody's measured at the end of the month preceding the IPO.

Table 4 replicates Altı's main result. We include but do not report control variables used in his regression specifications. Full regression estimates are available in the Internet Appendix. As shown in Panel A, hot-issue markets are positively related to IPO proceeds: IPO proceeds as a proportion of book assets are 10.3% larger in hot-issue markets. This coefficient is similar to Altı (2006), who reports a coefficient of 10.16 on HOT. We then examine if this result is robust to, 1) relaxing his definition of leverage and including firms with preferred shares, 2) extending the time period, and 3) controlling for credit market conditions at the time of the IPO. Including a control for credit spreads does not affect the significance of his result (column 2). As shown in column (3), his result persists when we relax the definition of leverage and allow firms with preferred shares to enter into the sample. Specifically, we treat preferred shares as an equity claim (and base the sample on LEV instead of LEV<sub>VPF</sub>) and only exclude firms with LEV outside of the unit interval if they do not have preferred shares. Adding back the control for credit spreads decreases the coefficient on HOT to 6.55, but it remains statistically significant (column 4).

We next extend the length of the sample to 2009. The later sample includes a greater proportion of firms without preferred shares. Altı's result is robust to extending the sample in this way (see columns 5-6). Relaxing the unit-interval restriction on leverage in column (7)

shows that the coefficient on HOT is further reduced to 2.57 with a t-statistic of 2.14 when the inclusion of firms with leverage outside the unit interval is permitted. Adding credit spreads to this specification renders the effect of HOT statistically insignificant (column 8). Finally, we run the proceeds regressions in the last column over the 1986-2009 sample period. As shown, the effect of hot-issue markets on IPO proceeds is positive but insignificant when the leverage rule is enforced (columns 9 and 10). Relaxing the leverage rule yields a coefficient that is close to zero (coefficient of 0.12) and not statistically significant. Thus when we exclude the early year part of Altı's sample (1975-1985), or broaden the sample to firms with leverage outside the unit interval, use the entire sample period and include controls for credit spreads, we find no significant hot-issue market effect on IPO issue proceeds.

Table 4 also shows that the coefficient estimate on *Default* is negative and statistically significant during 1975-1999, and over the entire sample period. Finding that the intensive margin for credit spreads is negative over the broader period is perhaps not surprising since credit spreads are countercyclical.<sup>16</sup>

#### **4.2 Leverage changes in the IPO year**

The absence of any significant relation between hot-issue markets and IPO proceeds for most of our sample period suggest that hot-issue markets are unlikely to be associated with transitory changes in capital structure in the later part of the sample. To examine transitory

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<sup>16</sup> See Becker and Ivashina (2014). To investigate the robustness of this finding we also examine debt issuance volume as reported in SDC Platinum. We define debt issuance as the sum of the issuance of bonds, notes and bank loans but exclude issuance of asset backed securities. We then define hot debt issuance markets in the same way as hot IPO markets except we define hot debt markets by whether total debt issuance in a month are above the median and de-trend monthly issuance volume to account for the increase in debt issuance over the time period. Overall we find that hot debt-issue markets are positively related to IPO issue proceeds.

changes in leverage we follow Alti (2006), and regress IPO-year changes in leverage on HOT and a set of control variables. The regression equation is as follow.

$$LEV_{it} - LEV_{i\ ipo-1} = \alpha + \beta HOT_{ipo} + \gamma Default_{ipo-1} + \delta X_{i\ ipo-1} + \varepsilon_{it} \quad (2)$$

Regression results are reported in Table 5 for the IPO year. The effect of hot-issue markets on leverage during the two years following the IPO are reported in the Internet Appendix.

The first column of Table 5 reproduces the original Alti (2006) regression. In the early part of the sample, hot-issue markets have a negative effect (coefficient of -2.55) on the change in leverage in the IPO year. In unreported tests we find that the effect of hot-issue markets on leverage disappears two years after the IPO, which is consistent with Alti's original finding. Relaxing the definition of leverage and including a broader sample of firms slightly decreases the regression coefficient on HOT (coefficient of -2.48 in column 3) and it remains statistically significant. However, controlling for credit spreads eliminates the significance of HOT on IPO-year changes in leverage. As shown in column (4), including the default spread reduces the magnitude of the coefficient on HOT to -1.21 and renders this coefficient insignificant (t-statistic -1.39).

Broadening the sample period to IPOs that occur through 2009 further weakens the significance of HOT on IPO-year changes in leverage. As shown in columns (6) and (8), when we include credit risk spreads in the regression we find no significant relationship between leverage changes and hot issues markets. Finally, as shown in columns (9) through (12) during the 1986- 2009 period we find no relationship between changes in leverage in the IPO year and hot-issue markets regardless of the leverage restriction or whether we control for credit spreads.

### 4.3 Robustness check

One potential explanation for the lack any significant hot-issue market effect on leverage after 1985 is that firms going public after 1985 were less likely to have significant debt capacity, and thus market-timing considerations were less important later in the sample. The increase over the sample period in the proportion of IPO firms that use preferred stock prior to going public is potentially consistent with this explanation. To examine this possibility we split the sample according to whether or not firms have preferred stock prior to going public. We then examine whether the sample of firms without preferred have a greater propensity to go public, pay a special dividend out of IPO proceeds and raise more proceeds during hot issues markets—which Altı (2006) argues are indications of market timing.

Results reported in the Internet Appendix show that there is no significant difference in the propensity to go public, nor pay a special dividend during hot-issue markets between the samples split based on the use of preferred. Moreover, controlling for credit spreads we find no significant relationship between IPO proceeds and HOT for firms with or without preferred shares over the 1975-2009 period. Overall, there is no evidence that hot-issue markets affect IPO proceeds in the sample of firms that are the most likely to engage in market timing (firms without preferred shares) once we control for credit spreads.

#### *4.3.1 IPO-year leverage changes*

We next investigate whether the hot-issues effect on IPO-year leverage is present in the subsample of firms without preferred shares, as these firms are the most likely candidates to engage in market timing. Indeed, we show in the Internet Appendix that the transitory effect of hot-issue markets on leverage during 1975-1999 documented by Altı appears to be driven by

firms that have prior debt capacity, as measured by the absence of preferred share financing prior to the IPO. The effect of HOT in firms without preferred shares is not robust, however, to controlling for credit-market conditions when these firms go public. The effect of credit spreads persists two years after the firm goes public.

Neither hot-issue markets nor credit market conditions have a significant effect on IPO-year leverage changes for firms that have preferred shares. Moreover, given the lack of any effect of hot-issue markets on IPO proceeds during 1986-2009, we do not expect to find any effect of HOT on leverage in the IPO year over this sub-period. Hot-issue market effects on leverage appears to be present only during 1975-1985, and only in firms with no preferred shares prior to their IPO.

Our results differ from those of Alti (2006) for two reasons. First, the effect of hot-issue markets is limited to firms that enjoy greater access to debt markets as private firms. Including a measure of long-term credit conditions absorbs all hot-issue effects on leverage for this subset of firms. Second, HOT issue markets are not related to IPO proceeds after 1985. Therefore, based on a broader sample of firms that also includes firms with little or no debt capacity at the time they go public, we do not find any evidence that hot-IPO markets have a transitory effect on IPO-year leverage. We conclude that changes in leverage when firms go public reflect a permanent change in capital structure, and this change appears to be independent of market-timing considerations, as measured by hot-issue markets.

## **5. Conclusion**

In most studies of capital structure, whether preferred stock is treated as debt or equity is relatively innocuous, partly because few publicly traded U.S. firms have preferred stock

outstanding, and for those with preferred stock, this type of security is generally a small fraction of total equity. For nearly half of companies going public, however, the common practice of treating preferred stock as debt is not innocuous. Almost all venture capital-backed IPOs have large amounts of convertible preferred stock outstanding prior to the IPO, and this preferred stock almost always has a mandatory conversion feature conditional on going public. Since these firms have a history of losses prior to going public, treating preferred shares as debt and restricting leverage to be in the unit interval biases the sample of firms going public towards more mature firms that have greater debt capacity.

Using Altı's definition of hot-issue markets, we find that the effect of hot-issues markets on IPO proceeds and leverage is not robust to controlling for credit market conditions, extending the sample in time, and broadening the sample of firms. The reason for this finding is twofold. First, the original Altı result is based on a sample of firms that is skewed towards older more mature firms that have significant debt capacity prior to going public. Once we broaden the sample and control for credit conditions at the time of the IPO, there is no significant relation between IPO proceeds and hot-issue markets. Second, there is no relation between hot-issue markets and IPO proceeds after 1985 regardless of whether the unit-interval restriction is imposed on leverage, and whether credit conditions are controlled for.

Using a larger sample of firms that includes firms with leverage outside the unit interval, we show that inferences about hot-issue market timing on leverage are sensitive to the inclusion of default spreads in the proceeds and leverage regressions. Overall, we do not find any evidence of transitory effects of hot-issue markets on leverage.

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**Table 1**  
**Summary statistics – IPO firms**

*Description:* This table reports summary statistics of firm characteristics in the year preceding the IPO, except for PROCEEDS, INST, TECH, and Age which are measured at the time of the IPO. Returns and financial ratios except for MB are in percentage points. Standard deviations for each of the variables are reported in parentheses. The sample WITH PEF excludes observations that did not have preferred shares prior to going public. The sample NO PEF excludes firms that had preferred shares prior to going public. Book debt is the sum of total liabilities and preferred shares minus convertible debt and deferred taxes. Book leverage LEVPF is the ratio of book debt to total assets. LEV is the ratio of short term and long-term debt to total assets. DLEVPF indicates the change in LEVPF in the IPO year. DLEV indicates the change in LEV in the IPO year. Market-to-book (MB) is defined as book debt plus the market value of equity divided by total assets measures at the industry level (SIC3). Profitability (EBITDA) equals earnings before interest, taxes and depreciation. INT.COVER equals the interest coverage ratio. CAPX denotes capital expenditures, RD is research and development expense. INV is the sum of CAPX and RD, where missing values of RD are set to zero. PROCEEDS equals the IPO proceeds in millions of 2011 dollars and includes primary and secondary shares but assumes that over-allotment options are not exercised. SALE equals sales in millions of 2011 dollars. TECH is a dummy for whether the firm is in the technology industry. Age is the founding age of the firm at the time of the IPO. MB equals the mean market-to-book ratio in the issuing firm's industry in the year prior to the IPO. PPE is property, plant and equipment. The dollar burn rate (DBR) is the difference between capital expenditures and operating cash flows in the year prior to the IPO in millions of 2011 dollars. Cash burn rate is ratio of the dollar burn rate to total proceeds. Stock comp / A equals stock compensation as a percentage of book assets. Fraction Neg. BE indicates the fraction of firms with negative book equity (classifying preferred shares as a debt claim). INST indicates that the firm had institutional investors prior to going public (venture capital, private equity or growth capital). The difference in means and medians between firm with and without preferred shares are all statistically significant at the 5% level of confidence or better with the exception of Stock compensation (Stk. Comp/A).

*Interpretation:* Treating preferred shares as a debt claim makes firms with these instruments appear more levered than they actually are. Firms with preferred shares prior to the IPO have characteristics associated with low debt capacity. These firms are smaller, younger, belong to industries with more growth options, have higher cash burn rates, are more likely to pay their executives with stock and are more likely to have negative book equity.

**Continued on next page.**

Variable	Definition	All firms (N=3,875)		NO PREF (N=2,114)		WITH PREF (N=1,761)	
		MEAN (1)	MEDIAN (2)	MEAN (3)	MEDIAN (4)	MEAN (5)	MEDIAN (6)
LEVPF	Book debt/Assets	99.8	81.7	67.6	68.4	138.4	110.5
	SD. DEV.		(87.9)		(25.07)		(116.24)
DLEVPF	Ch. LEVPF	-63.3	-37.3	-28.7	-25.8	-104.7	-77.4
			(92.2)		(23.2)		(122.2)
LEV	Fin. debt/Assets	33.3	29.1	35.3	34.4	30.9	21.8
			(27.2)		(24.1)		(30.3)
DLEV	Ch. LEV	-17.4	-13.4	-17.7	-15.5	-16.9	-11.1
			(20.7)		(19.0)		(22.7)
INT.COVER	Int. coverage ratio	9.8	4.2	20.8	5.8	-3.7	2.3
			(73.6)		(66.4)		(79.6)
EBITDA/A	EBITDA/Assets	10.6	15.8	19.6	20.0	-0.3	9.9
			(27.8)		(20.8)		(31.1)
PPE/A	PP&E/Assets	26.0	18.7	28.6	22.0	22.8	16.0
			(21.5)		(22.9)		(19.4)
INV/A	(Capx+R&D)/Assets	19.6	13.8	15.9	10.7	24.0	20.1
			(18.3)		(15.7)		(20.0)
CAPX/A	Capx/Assets	10.1	6.3	10.8	6.7	9.2	6.0
			(11.3)		(12.2)		(10.0)
RD/A	R&D/Assets	9.6	0.0	5.1	0.0	14.9	8.0
			(15.4)		(10.8)		(18.1)
PROCEEDS	IPO proceeds	85.3	46.2	79.6	36.2	92.2	56.3
			(188.0)		(213.1)		(152.4)
SALE	Sales(\$2011)	233.3	50.4	265.6	60.3	194.5	40.6
			(1022.8)		(1228.9)		(697.7)
INST	Frac. inst. inv.	0.5	1.0	0.3	0.0	0.8	1.0
			(0.5)		(0.5)		(0.4)
TECH	Frac. tech. sector	0.4	0.0	0.3	0.0	0.5	1.0
			(0.5)		(0.5)		(0.5)
AGE	Age in years	15.4	9.0	17.4	11.0	12.9	7.0
			(18.3)		(19.4)		(16.7)
MB(SIC3 pre-IPO)	Market-to-book ratio	2.7	2.4	2.4	2.1	3.1	2.7
			(1.4)		(1.1)		(1.5)
DBR	Dollar burn rate	1.3	-0.6	-1.4	-1.3	4.5	1.0
			(64.0)		(78.3)		(40.3)
CBR	Cash burn rate	3.8	-1.7	-0.3	-4.8	8.8	2.1
			(85.4)		(37.9)		(119.5)
Stk. comp / A	Stock comp./Assets	25.4	0.5	11.5	0.1	33.0	1.2
			(159.2)		(97.7)		(184.1)
Frac. neg. BE	Frac. neg. book equity	0.3	0.0	0.1	0.0	0.6	1.0
			(0.5)		(0.2)		(0.5)

**Table 2****Summary statistics – public firms that issue preferred shares**

*Description:* Panel A of this table reports summary statistics of firm characteristics and information on the composition of the sample of publicly traded firms excluding financials and utilities. Firm characteristics are taken in the third year the firm shows up in COMPUSTAT for the 1975-2009 time period. Returns and financial ratios except for MB are in percentage terms. All variables are defined in Table 1. The column labeled TSTAT reports t-statistics for the difference in means across firms without preferred shares and firms with preferred shares. The column labeled P-VAL reports p-values for the difference in medians across the two types of firms. Panel B reports the characteristics of all public firms in the year they issue securities of a given type. The sample period in Panel B is from 1987 to 2009 and the data is obtained from Dealscan and SDC. Debt issuance includes term loans but excludes credit lines. Firm years with a security issuance are classified according to whether the firm issues preferred shares, equity or debt. The sample of equity and debt issues excludes firms that have preferred shares on their balance sheet. The differences in means and medians between firms with and without preferred shares are all significant at the 1% confidence level or better with the exception of stock compensation (Stock comp/A).

**Panel A: Public firms with and without preferred shares 3 years after going public**

	NO PREF (12,018 firms)		WITH PREF (2,130 firms)	
	MEAN	MEDIAN	MEAN	MEDIAN
	(1)	(2)	(3)	(4)
LEVPF	44.0	41.6	71.0	61.2
LEV	23.4	19.2	33.6	30.7
INTCOVER	-20.2	3.6	-10.6	2.7
EBITDA/A	6.9	11.2	3.5	9.7
PPE/A	31.4	24.1	34.5	29.0
INV/A	13.0	9.2	10.9	7.1
CAPX/A	8.4	5.5	7.5	5.0
R&D/A	4.4	0.0	3.2	0.0
SALE (\$M 2011)	963	110	1933	195
MB	1.78	1.27	1.56	1.13
PREF/A	0.00	0.00	10.68	5.05
Stock comp/A	1.7	0.7	2.4	0.8
Fraction neg. BE	0.02	0.00	0.14	0.00

*Interpretation:* Preferred shares issuance by public firms is rare. Those public firms that do issue preferred shares are larger, have higher leverage ratios (LEV), lower profitability (EBITDA/A), lower capital expenditures (CAPX/A) and more tangible assets (PPE/A).

**Panel B: Preferred share issuance activity by all public firms**

	Preferred Issuers			Debt Issuers			SEO Issuers			T-Stat	P-Value	T-Stat	P-Value
	Mean	Median	N	Mean	Median	N	Mean	Median	N	(1)-(4)	(2)-(5)	(1)-(7)	(2)-(8)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
SALE (\$M 2011)	4345	642	111	4935	1086	8335	1067	151	4953	-0.7	0.02	3.9	0.00
LEV	43.9	43.0	111	33.8	31.6	8342	24.4	20.3	4956	4.3	0.00	8.3	0.00
MB	1.8	1.3	111	1.7	1.4	8342	2.9	2.0	4956	0.9	0.21	-8.5	0.00
EBITDA/A	1.4	9.7	110	12.8	13.4	8309	2.3	11.2	4946	-4.6	0.00	-0.3	0.18
PPE/A	36	29.4	111	35.7	31.1	8311	28.6	20.2	4954	0.1	0.77	3.0	0.00
CAPX/A	9.4	5.4	105	7.4	5.2	8210	8.1	4.8	4913	2.2	0.38	1.3	0.28
R&D/A	4.6	0	111	1.8	0	8343	8.4	0	4957	2.2	0.14	-2.9	0.00
INTCOVER	6.2	-2.3	106	-13.0	-5.3	8113	-9.0	-4.4	4306	-3.8	0.00	-2.9	0.00
Stock comp/A	9.2	8.0	4	55.6	25.5	1792	191.7	49.1	1193	-8.8	0.05	-17.9	0.05

*Interpretation:* The characteristics of public firms that issue preferred shares are more similar to firms that issue debt than firms that issue equity.

**Table 3****Evolution of leverage and debt issuance after the IPO**

*Description:* This table mean and median book leverage (LEV) for the full sample of IPOs and for the hand-collected subsample of IPO firms. For the full sample, information on leverage is from COMPUSTAT. Information on leverage for the hand-collected sample is based on the offering prospectuses of 500 randomly selected firms, of which we find pre-IPO leverage values for 363 firms. All leverage ratios are in percentage points. In Panel A, the differences in means and medians between firms with and without preferred shares are all statistically significant at the 1% level of confidence. These differences are also significant in Panel B, with the exception of mean leverage at time T-3 for firms with preferred shares. The symbol  $\psi$  indicates that the change in leverage between time 5 and time 0 is statistically significant at the 1% level of confidence.

*Interpretation:* Based on high pre-IPO leverage levels, the decline in leverage in the IPO year reflects a permanent change in capital structure.

**Panel A: Full sample**

TIME	Firms without pre-IPO preferred shares (2,114 firms)		Firms with pre-IPO preferred shares (1,761 firms)	
	Mean	Median	Mean	Median
-1	38.5	35.5	30.9	21.8
0	18.6	10.6	13.9	3.5
1	22.4	17.0	16.0	4.8
2	24.2	19.3	17.2	6.2
3	25.3	20.7	17.9	7.2
4	25.9	22.5	19.1	8.8
5	25.2 $\psi$	21.0 $\psi$	19.3 $\psi$	9.5 $\psi$

**Panel B: Hand-collected sample**

Time	Firms without pre-IPO preferred shares (146 firms)		Firms with pre-IPO preferred shares (217 firm)	
	Mean	Median	Mean	Median
-3	34.1	26.7	27.8	6.4
-2	36.7	32.2	23.5	13.7
-1	40.1	40.3	25.0	18.7
0	21.1	13.2	12.5	1.6
1	25.0	24.8	12.3	1.2
2	25.8	23.2	12.2	1.3
3	23.8	16.4	12.4	1.7
4	26.6	22.2	13.3	0.9
5	26.2	20.3	13.3	1.4

**Table 4**  
**Hot-issue markets and IPO proceeds**

*Description:* The dependent variable is total IPO proceeds over book assets in percent, where book assets are measured at the end of the year the firm goes public. *Default* equals the difference (in pct.) between the yield on 30Y BBB rated bonds and the yield on 30Y AAA rated bonds provided by Moody's and measured at the end of the month preceding the IPO. Control variables use in Alti (2006) are included but not reported. These variables are the firm's market-to-book ratio in the year it goes public, profitability over assets, the log of sales, asset tangibility, research and development expenses over assets (set to zero if missing), a dummy variable for missing R&D expenses, industry fixed effects, and leverage (LEV) at the end of the year prior to the IPO. The Original leverage restriction refers to when the sample is restricted to treating preferred shares as debt and excluding firms with leverage (LEV) outside the unit interval. The Relaxed restriction of leverage treats preferred shares as equity and limits the sample to firms with leverage (LEV) within the unit interval unless they have preferred shares. T-statistics are in parentheses; they are based on standard errors that are robust to heteroskedasticity.

*Interpretation:* Hot-issue market timing effects on IPO proceeds are not robust extending the sample period, controlling for credit market conditions at time of issuance and to sample selection. The significance of hot-issue markets disappears when the sample is extended to 2009, one controls for credit market conditions at the time of the IPO, and one includes firms with leverage outside of the unit interval. There is no evidence of hot-issue market timing on IPO proceeds after 1985.

	1975-1999 (300 months)				1975-2009 (420 months)				1986-2009 (288 months)			
Leverage restriction:	Original	Original	Relaxed	Relaxed	Original	Original	Relaxed	Relaxed	Original	Original	Relaxed	Relaxed
Credit spreads:	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
HOT	10.29	8.31	8.95	6.55	5.08	3.38	2.57	0.84	2.21	0.35	0.12	-1.81
	(7.75)	(6.10)	(6.47)	(4.56)	(4.11)	(2.68)	(2.14)	(0.68)	(1.43)	(0.22)	(0.08)	(-1.22)
Default		-5.04		-6.34		-5.55		-6.04		-8.53		-8.66
		(-4.00)		(-5.25)		(-4.63)		(-5.33)		(-4.27)		(-4.45)
AdjRSq	0.37	0.37	0.31	0.31	0.37	0.38	0.30	0.31	0.37	0.37	0.30	0.30
N	2405	2405	3256	3256	2727	2727	3875	3875	2161	2161	3264	3264

**Table 5**

**Hot-issue markets changes in capital structure in the IPO year**

*Description:* The dependent variable is the change in leverage relative to the year preceding the IPO:  $LEV-LEV(\text{pre-IPO})$ . Each column and each heading represents a separate regression equation. The table reports the regression coefficients and t-statistics on *HOT* and *Default* for each regression, where *Default* equals the difference (in pct.) between the yield on 30Y BBB rated bonds and the yield on 30Y AAA rated bonds provided by Moody's and measured at the end of the month preceding the IPO. The other independent variables used in Alti (2006) are included but not reported. These variables are the firm's market-to-book ratio in the year it goes public, profitability over assets, the log of sales, asset tangibility, research and development expenses over assets (set to zero if missing), a dummy variable for missing R&D expenses, industry fixed effects, and leverage (LEV) at the end of the year prior to the IPO. The original leverage restriction refers to when the sample is restricted to treating preferred shares as debt and excluding firms with leverage (LEV) outside the unit interval. The relaxed restriction of leverage treats preferred shares as equity and limits the sample to firms with leverage (LEV) within the unit interval unless they have preferred shares. T-statistics are in parentheses; they are based on standard errors that are robust to heteroskedasticity.

*Interpretation:* Inferences about hot-issue market timing effects on capital structure are sensitive to the sample period, and whether controls for credit-market conditions at the time of the IPO are included in the regression. Hot-issue markets have no impact on IPO-year leverage after 1985.

Leverage restriction: Credit spreads:	1975-1999 (300 months)				1975-2009 (420 months)				1986-2009 (288 months)			
	Original No (1)	Original Yes (2)	Relaxed No (3)	Relaxed Yes (4)	Original No (5)	Original Yes (6)	Relaxed No (7)	Relaxed Yes (8)	Original No (9)	Original Yes (10)	Relaxed No (11)	Relaxed Yes (12)
<i>HOT</i>	-2.55 (-2.89)	-1.26 (-1.39)	-2.48 (-2.93)	-1.21 (-1.39)	-1.30 (-1.76)	-0.22 (-0.29)	-1.41 (-2.08)	-0.42 (-0.60)	-0.64 (-0.73)	0.55 (0.59)	-0.93 (-1.18)	0.23 (0.27)
<i>Default</i>		3.28 (4.68)		3.36 (5.13)		3.51 (5.29)		3.46 (5.61)		5.45 (4.30)		5.22 (4.58)
AdjRSq	0.52	0.53	0.58	0.58	0.52	0.53	0.58	0.58	0.51	0.51	0.58	0.59
N	2405	2405	3256	3256	2727	2727	3875	3875	2161	2161	3264	3264



## **Data Appendix**

### **Sample construction**

The sample consists of initial public offerings (IPOs) that occur between 1975 and 2009. This list is obtained from Jay Ritter. We end the sample in 2009 in order to track post-IPO issuance for two years following the IPO. Our sample is restricted to firms for which the offer price exceeds \$5.00 per share. We exclude utility firms (SIC 4900-4999) and financial firms (SIC 6000 -6999) as well as American Depositary Receipts, closed-end funds, unit IPOs, spinoffs, limited partnerships and REITs. This sample of firms is matched to stock price data from CRSP and accounting data from COMPUSTAT with the restriction that all of the firms have accounting data on book assets and liabilities in both the pre-IPO and IPO year. These steps yield a set of 3,875 IPOs after imposing a number of filters described below that are meant to ensure the quality of the accounting data, especially in the pre-IPO year.

We exclude observations that have less than \$10 million (in 2011 dollars) in book assets in the IPO year. Book debt equals total liabilities (COMPUSTAT annual item LT) and preferred stock (Item PSTKL, replaced by the redemption value of preferred stock (PSTKRV) when missing) minus deferred taxes (TXDITC) and convertible debt (DCVT). Book equity is total assets (A) minus book debt. The market-to-book ratio (MB) is defined as book debt plus market equity (common shares outstanding (CSHO) times share price (PRCC\_F) divided by total assets. Unlike previous studies we do not exclude observations with high market-to-book values in the year prior to going public. Leverage (LEV) equals the sum of short- and long-term debt to book assets, expressed in percentage points. Observations with leverage over 100% in the pre-IPO or in the IPO year are excluded from the sample only if these firms do not have preferred shares.

Profitability is measured by EBITDA where EBITDA is earnings before interest, taxes, and depreciation.  $\text{Log}(\text{SALE})$  is the logarithm of net sales (item SALE) in millions of 2011 dollars. Asset tangibility, denoted as PPE, is defined as net plant, property, and equipment. RD is research and development expense, replaced with zero when missing. A dummy variable RDD takes the value of one when COMPUSTAT data item XRD is missing. We use total assets to deflate R&D expenses in order to ensure comparability with other studies.

Total investment, INV, is measured as the sum of capital expenditures (item CAPX) and research and development expense (set to zero when missing).<sup>17</sup> Debt issues, DI, equal the change in book debt divided by total assets at the end of the current year. Observations with  $\text{INV}/A$  greater than the 99<sup>th</sup> percentile are dropped from the sample. We drop firm-year observations for which the change in book debt over total assets or the change in book equity net of retained earnings over total assets are less than the 1<sup>st</sup> percentile or exceed the 99<sup>th</sup> percentiles, starting in the IPO year. We also drop firm-year observations for which  $\text{EBITDA}/A$ ,  $\text{CAPX}/A$ , or the change in retained earnings over book assets is greater than 100% in absolute value in any year of the sample.

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<sup>17</sup> Missing values of R&D are set to zero in order not to bias the sample in favor of firms whose primary investments are in the form of research and development expenses.

## **Internet Appendix**

Unless indicated otherwise, the sample is based on the definition of leverage that treats preferred shares as equity and restricts firms to having leverage (LEV) within the unit interval unless they have preferred shares prior to going public.

**Table IA1**  
**Summary statistics on firms for 1975-1999**

*Description:* This table reports summary statistics of firm characteristics in the year preceding the IPO, except for PROCEEDS, INST, TECH, and Age which are measured at the time of the IPO. Returns and financial ratios except for MB are in percentage points. The sample WITH PREF excludes observations that did not have preferred shares prior to going public. The sample NO PREF excludes firms that had preferred shares prior to going public. Variable definitions are in Table 1.

	<u>All firms (N=3,256)</u>		<u>NO PREF (N=1,898)</u>		<u>WITH PREF (N=1,358)</u>		T-STAT: (1)-(3)	P-VAL:(2)-(4)
	MEAN	MEDIAN	MEAN	MEDIAN	MEAN	MEDIAN		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
LEVPF	94.3	79.6	67.2	68.2	132.0	106.4	-22.7	0.0
Ch. LEVPF	-58.0	-36.2	-29.3	-26.5	-98.2	-72.2	23.2	0.0
LEV	33.4	29.4	34.4	33.3	32.0	23.4	2.6	0.0
Ch. LEV	-17.7	-13.9	-17.7	-15.5	-17.7	-11.9	0.0	0.0
INT.COVER (winsorized)	12.15	4.59	21.7	6.1	-1.3	2.6	9.0	0.0
EBITDA/A	12.4	17.2	20.2	21.0	1.6	11.8	20.5	0.0
PPE/A	26.6	19.6	28.3	22.1	24.2	17.2	5.4	0.0
INV/A	19.7	14.0	16.3	11.3	24.3	21.1	-12.7	0.0
CAPX/A	10.5	6.7	11.0	6.9	9.7	6.3	3.4	0.1
RD/A	9.2	0.0	5.3	0.0	14.7	7.9	-16.0	0.0
PROCEEDS	65.4	39.4	61.6	32.2	70.6	47.9	-1.5	0.0
SALE(\$M 2011)	184.2	46.5	195.2	54.0	168.8	36.9	0.8	0.0
INST	0.50	1.0	0.28	0.0	0.80	1.0	-34.0	.
TECH	0.40	0.0	0.31	0.0	0.52	1.0	-12.3	0.0
AGE	14.82	8.0	16.43	10.0	12.56	7.0	6.1	0.0
MB(SIC3 pre-IPO)	2.4	2.2	2.3	2.0	2.7	2.5	-11.5	0.0
Dollar burn rate (DBR)	1.3	-0.6	-0.3	-1.2	3.7	0.5	-2.5	0.0
Cash burn rate	3.6	-2.1	-0.3	-4.9	9.2	1.1	-2.9	0.0
Fraction neg. BE	0.26	0.0	0.05	0.0	0.55	1.0	-38.5	0.0

**Table IA2****Proportion of firms that go public in HOT IPO markets by type of firm**

*Description:* This table reports the fraction of firms that go public in hot-issue (HOT) markets by type of firm. NO PREF indicates the subsample of firms without preferred shares prior to going public. WITH PREF indicates the subsample of firms with preferred shares prior to going public. T-stat is the t-statistic that tests whether the difference in the proportion of firms that go public in hot-issue markets is significantly different between firms with and without preferred shares.

*Interpretation:* Firms with and without preferred shares are equally likely to go public during hot-issue markets.

		1975-1999	1975-2009
All firms	Proportion	0.92	0.86
	Nb. IPO in HOT	2988	3332
	Total IPOs	3256	3875
NO PREF	Proportion	0.91	0.86
	Nb. IPO in HOT	1720	1826
	Total IPOs	1898	2114
WITH PREF	Proportion	0.93	0.86
	Nb. IPO in HOT	1268	1506
	Total IPOs	1358	1761
T-stat (NO PREF vs. WITH PREF)		-2.82	0.77

**Table IA3**  
**Special and regular dividends**

*Description:* This table reports special and regular dividends across HOT and COLD IPO markets. IPO year payouts measure the ratio of IPO-year common dividends to year-end book equity in percentage. Each of the first four rows reports the proportion in percentage of firms that have IPO year payouts that fall within the indicated range. The last two rows of each panel report the proportions (in pct.) of firms that pay regular and special dividends. Panel A reports the proportions for the 1975-1999 sample period. Panel B reports the proportions for the 1975-2009 sample period. The t-statistic compares dividends across HOT and COLD markets. Special dividends occur when firms pay only one dividend in the 12 month period following the IPO. Regular dividends occur when the firm pays two or more dividends in the 12-month period following the IPO.

*Interpretation:* IPO firms without preferred shares are equally likely to pay a special dividend out of IPO proceeds during HOT and COLD markets.

**Panel A: 1975-1999**

	WITHOUT PREFERRED			t-stat	WITH PREFERRED			t-stat
	All	HOT	COLD		All	HOT	COLD	
<i>IPO year payouts</i>								
0%:	74.7	74.4	76.7		93.6	94.3	89.8	
0%-10%:	13.4	13.1	15.3		4.2	3.9	6.3	
10%-25%:	5.2	5.6	2.4		0.3	0.3	0.8	
25% and above:	6.1	6.4	4.2		0.4	0.3	0.8	
<i>Special vs. regular dividends</i>								
Regular	78.2	77.0	84.6		88.4	84.4	100.0	
Special	21.8	23.0	15.4	0.9	11.6	15.6	0.0	1.4

**Panel B: 1975-2009**

	WITHOUT PREFERRED			t-stat	WITH PREFERRED			t-stat
	All	HOT	COLD		All	HOT	COLD	
<i>IPO year payouts</i>								
0%:	75.5	75.0	80.3		94.2	94.6	87.8	
0%-10%:	13.4	13.0	18.0		3.9	3.4	11.1	
10%-25%:	5.3	5.7	1.1		0.3	0.3	0.0	
25% and above:	5.5	6.0	0.6		0.1	0.2	0.0	
<i>Special vs. regular dividends</i>								
Regular	80.9	79.3	87.5		88.1	85.7	94.1	
Special	19.1	20.7	12.5	1.2	11.9	14.3	5.9	0.9

**Table IA4**

**Market timing and IPO proceeds – all firms**

The dependent variable is total IPO proceeds over book assets in percent, where book assets are measured at the end of the year the firm goes public. *Default* equals the difference (in pct.) between the yield on 30Y BBB rated bonds and the yield on 30Y AAA rated bonds provided by Moody's and measured at the end of the month preceding the IPO. *Log(SALE)* equals the natural logarithm of SALE(\$M 2011). The other independent variables are defined in Table 1. Industry dummies, based on 3-digit SIC codes, are included but not reported. The Original leverage restriction refers to when the sample is restricted by treating preferred shares as debt and excluding firms with leverage (LEVPF) outside the unit interval. The Relaxed restriction of leverage treats preferred shares as equity and limits the sample to firms with leverage (LEV) within the unit interval unless they have preferred shares. T-statistics are in parentheses; they are based on standard errors that are robust to heteroskedasticity.

**Panel A: Without controls for credit spreads**

Sample:	1975-1999	1975-1999	1975-2009	1975-1985	1986-2009
Leverage restriction:	Original	Relaxed	Relaxed	Relaxed	Relaxed
	(1)	(2)	(3)	(4)	(5)
HOT	10.29 (7.75)	8.95 (6.47)	2.57 (2.14)	13.18 (6.10)	0.12 (0.08)
MB	1.34 (3.51)	0.32 (2.32)	0.50 (2.70)	3.67 (3.26)	0.43 (2.48)
EBITDA/A	0.28 (7.65)	0.17 (6.37)	0.15 (6.61)	0.15 (1.96)	0.16 (6.41)
Log(SALE)	-7.13 (-17.64)	-7.57 (-20.32)	-6.89 (-21.51)	-7.84 (-8.67)	-6.97 (-19.15)
PPE/A	-0.09 (-2.82)	-0.12 (-4.22)	-0.13 (-5.19)	-0.11 (-1.77)	-0.11 (-3.70)
RD/A	0.28 (3.76)	0.28 (5.53)	0.27 (6.08)	0.30 (1.81)	0.27 (5.81)
Dummy: missing RD	-2.51 (-1.84)	-2.16 (-1.59)	-2.65 (-2.19)	-1.91 (-0.60)	-1.94 (-1.44)
LEV(pre-IPO)	-0.09 (-3.34)	0.01 (0.25)	0.03 (1.21)	-0.11 (-1.46)	0.04 (1.64)
AdjRSq	0.366	0.308	0.303	0.456	0.295
N	2405	3256	3875	611	3264

**Panel B: With controls for credit spreads**

Sample:	1975-1999	1975-1999	1975-2009	1975-1985	1986-2009
Leverage restriction:	Original	Relaxed	Relaxed	Relaxed	Relaxed
	(1)	(2)	(3)	(4)	(5)
HOT	8.31 (6.10)	6.55 (4.56)	0.84 (0.68)	13.21 (6.05)	-1.81 (-1.22)
Default	-5.04 (-4.00)	-6.34 (-5.25)	-6.04 (-5.33)	0.12 (0.04)	-8.66 (-4.45)
MB	1.30 (3.46)	0.31 (2.23)	0.49 (2.64)	3.66 (3.24)	0.43 (2.43)
EBITDA/A	0.29 (7.90)	0.18 (6.84)	0.17 (7.13)	0.15 (1.97)	0.16 (6.67)
Log(SALE)	-7.37 (-17.87)	-7.78 (-20.51)	-7.10 (-21.70)	-7.84 (-8.67)	-6.99 (-19.22)
PPE/A	-0.08 (-2.53)	-0.11 (-3.73)	-0.12 (-4.64)	-0.11 (-1.76)	-0.10 (-3.36)

RD/A	0.27 (3.52)	0.26 (5.13)	0.25 (5.74)	0.30 (1.81)	0.26 (5.71)
Dummy: missing RD	-2.71 (-2.01)	-2.30 (-1.71)	-2.74 (-2.28)	-1.91 (-0.60)	-2.11 (-1.58)
LEV(pre-IPO)	-0.09 (-3.32)	0.00 (0.17)	0.02 (1.13)	-0.11 (-1.46)	0.04 (1.61)
AdjRSq	0.37	0.314	0.307	0.455	0.299
N	2405	3256	3875	611	3264

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**Table IA5**

**Market timing and change in capital structure in the IPO year**

The dependent variable is the change in leverage relative to the year preceding the IPO: LEV-LEV(pre-IPO). *Default* equals the difference (in pct.) between the yield on 30Y BBB rated bonds and the yield on 30Y AAA rated bonds provided by Moody's and measured at the end of the month preceding the IPO. The other independent variables are defined in Table 1. The Original leverage restriction refers to when the sample is restricted to treating preferred shares as debt and excluding firms with leverage (LEVVPF) outside the unit interval. The Relaxed restriction of leverage treats preferred shares as equity and limits the sample to firms with leverage (LEV) within the unit interval unless they have preferred shares. Industry dummies, based on 3-digit SIC codes, are included but not reported. T-statistics are in parentheses; they are based on standard errors that are robust to heteroskedasticity.

**Panel A: All firms 1975-1999 – Original restriction on leverage**

Time:	No control for credit spreads			With control for credit spreads		
	IPO (1)	IPO+1 (2)	IPO+2 (3)	IPO (4)	IPO+1 (5)	IPO+2 (6)
HOT	-2.55 (-2.89)	-1.45 (-1.38)	0.62 (0.53)	-1.26 (-1.39)	-0.15 (-0.14)	1.90 (1.53)
Default				3.28 (4.68)	3.48 (4.21)	3.47 (3.64)
MB	-0.77 (-4.40)	-0.77 (-3.09)	-0.47 (-1.93)	-0.75 (-4.35)	-0.74 (-3.02)	-0.44 (-1.84)
EBITDA/A	-0.10 (-6.52)	-0.25 (-7.94)	-0.24 (-7.56)	-0.11 (-6.99)	-0.26 (-8.24)	-0.25 (-7.77)
Log(SALE)	1.73 (6.94)	1.51 (4.72)	2.16 (5.70)	1.89 (7.40)	1.73 (5.23)	2.39 (6.21)
PPE/A	0.06 (2.85)	0.18 (6.91)	0.21 (7.33)	0.06 (2.59)	0.17 (6.55)	0.19 (6.92)
RD/A	-0.08 (-2.36)	-0.21 (-3.47)	-0.26 (-4.57)	-0.07 (-1.98)	-0.19 (-3.17)	-0.24 (-4.11)
Dummy: missing RD	0.41 (0.49)	1.16 (1.13)	0.84 (0.73)	0.54 (0.65)	1.27 (1.24)	1.13 (0.98)
LEV(pre-IPO)	-0.64 (-26.68)	-0.67 (-26.96)	-0.69 (-25.98)	-0.64 (-26.84)	-0.67 (-27.17)	-0.69 (-26.15)
AdjRSq	0.52	0.456	0.47	0.525	0.46	0.473
N	2405	2231	1983	2405	2231	1983

**Panel B: All firms 1975-1999 – Relaxed restriction on leverage**

Time:	No control for credit spreads			With control for credit spreads		
	IPO (1)	IPO+1 (2)	IPO+2 (3)	IPO (4)	IPO+1 (5)	IPO+2 (6)
HOT	-2.48 (-2.93)	-1.40 (-1.33)	0.82 (0.72)	-1.21 (-1.39)	0.06 (0.06)	2.13 (1.79)
Default				3.36 (5.13)	3.97 (4.97)	3.61 (4.08)
MB	-0.28 (-3.43)	-0.35 (-3.19)	-0.52 (-2.33)	-0.27 (-3.34)	-0.34 (-3.11)	-0.47 (-2.16)
EBITDA/A	-0.08 (-6.49)	-0.24 (-9.27)	-0.19 (-7.48)	-0.08 (-7.01)	-0.25 (-9.67)	-0.20 (-7.80)
Log(SALE)	2.15 (9.39)	2.07 (7.17)	2.44 (6.96)	2.27 (9.75)	2.26 (7.67)	2.62 (7.45)
PPE/A	0.08 (3.63)	0.25 (9.77)	0.23 (8.82)	0.07 (3.27)	0.23 (9.24)	0.22 (8.29)
RD/A	-0.11	-0.26	-0.20	-0.10	-0.24	-0.18

	(-5.45)	(-5.59)	(-4.29)	(-4.87)	(-5.10)	(-3.90)
Dummy: missing						
RD	0.19	1.59	1.90	0.27	1.63	2.08
	(0.24)	(1.61)	(1.75)	(0.34)	(1.66)	(1.91)
LEV(pre-IPO)	-0.68	-0.72	-0.72	-0.68	-0.72	-0.71
	(-29.38)	(-34.75)	(-31.17)	(-29.51)	(-34.87)	(-31.26)
AdjRSq	0.577	0.54	0.53	0.58	0.544	0.533
N	3256	2996	2639	3256	2996	2639

**Panel C: All firms 1975-2009 – Relaxed restriction on leverage**

Time:	No control for credit spreads			With control for credit spreads		
	IPO (1)	IPO+1 (2)	IPO+2 (3)	IPO (4)	IPO+1 (5)	IPO+2 (6)
HOT	-1.41	0.59	1.74	-0.42	1.74	2.77
	(-2.08)	(0.75)	(2.00)	(-0.60)	(2.19)	(3.07)
Default				3.46	4.02	3.69
				(5.61)	(5.30)	(4.50)
MB	-0.29	-0.34	-0.54	-0.28	-0.33	-0.50
	(-3.58)	(-3.22)	(-2.53)	(-3.48)	(-3.12)	(-2.39)
EBITDA/A	-0.07	-0.21	-0.17	-0.08	-0.23	-0.18
	(-6.76)	(-9.50)	(-7.56)	(-7.41)	(-10.04)	(-7.96)
Log(SALE)	2.16	2.07	2.35	2.28	2.28	2.54
	(11.12)	(8.42)	(7.91)	(11.56)	(9.06)	(8.49)
PPE/A	0.07	0.25	0.23	0.06	0.24	0.22
	(3.93)	(11.18)	(10.06)	(3.50)	(10.57)	(9.47)
RD/A	-0.11	-0.23	-0.18	-0.10	-0.21	-0.16
	(-5.92)	(-5.45)	(-4.40)	(-5.40)	(-5.06)	(-4.03)
Dummy: missing						
RD	0.16	1.88	2.29	0.21	1.88	2.42
	(0.22)	(2.17)	(2.37)	(0.29)	(2.18)	(2.50)
LEV(pre-IPO)	-0.67	-0.71	-0.71	-0.67	-0.70	-0.71
	(-33.35)	(-38.45)	(-33.80)	(-33.45)	(-38.45)	(-33.80)
AdjRSq	0.577	0.546	0.536	0.58	0.55	0.539
N	3875	3559	3151	3875	3559	3151

**Panel D: All firms 1975-1985, 1986-2009 – Relaxed restriction on leverage**

Time:	No control for credit spreads			With control for credit spreads		
	IPO (1)	IPO+1 (2)	IPO+2 (3)	IPO (4)	IPO+1 (5)	IPO+2 (6)
	<i>Sample period: 1975-1985</i>					
HOT	-4.31	-2.76	-1.72	-4.25	-3.05	-2.42
	(-3.06)	(-1.56)	(-0.89)	(-3.00)	(-1.78)	(-1.25)
Default				0.37	-1.46	-4.11
				(0.23)	(-0.76)	(-1.95)
AdjRSq	0.58	0.44	0.45	0.58	0.44	0.45
N	611	582	528	611	582	528
	<i>Sample period: 1986-2009</i>					
HOT	-0.93	1.51	2.57	0.23	2.51	3.60
	(-1.18)	(1.70)	(2.60)	(0.27)	(2.67)	(3.45)

Default				5.22 (4.58)	4.35 (3.28)	4.55 (3.05)
AdjRSq	0.58	0.57	0.56	0.59	0.57	0.56
N	3264	2977	2623	3264	2977	2623

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**Table IA6****Market timing and IPO proceeds – by type of firm**

*Description:* The dependent variable is total IPO proceeds over book assets in percent, where book assets are measured at the end of the year the firm goes public. *Default* equals the difference (in pct.) between the yield on 30Y BBB rated bonds and the yield on 30Y AAA rated bonds provided by Moody's and measured at the end of the month preceding the IPO.  $\text{Log}(\text{SALE})$  equals the natural logarithm of SALE(\$M 2011). The other independent variables are defined in Table 1. Industry dummies, based on 3-digit SIC codes, are included but not reported. T-statistics are in parentheses; they are based on standard errors that are robust to heteroskedasticity. Panels A and B report regression results by type of firm, where firms are classified according to whether they have preferred shares prior to going public.

*Interpretation:* Firms without preferred shares are more sensitive to equity-market conditions, as measured with HOT, and credit-market conditions, as measured with the lagged default spread. In the broader time period that ends in 2009, neither type of firm's IPO proceeds is sensitive to hot-issue markets once credit market conditions at the time of the IPO are controlled for.

**Panel A: Firms without preferred shares**

	No control for credit spreads				With control for credit spreads			
	1975-1999	1975-2009	1975-1985	1986-2009	1975-1999	1975-2009	1975-1985	1986-2009
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
HOT	9.62 (5.89)	4.94 (3.20)	11.32 (4.68)	1.72 (0.85)	7.31 (4.42)	3.01 (1.94)	11.30 (4.61)	-0.45 (-0.22)
Default					-5.72 (-3.90)	-6.29 (-4.47)	-0.08 (-0.03)	-10.72 (-4.26)
MB	1.98 (3.31)	2.09 (3.59)	3.09 (2.40)	1.92 (3.10)	1.91 (3.22)	2.01 (3.48)	3.09 (2.41)	1.85 (3.02)
EBITDA/A	0.20 (4.69)	0.19 (4.83)	0.23 (3.38)	0.22 (4.38)	0.21 (4.97)	0.21 (5.18)	0.23 (3.37)	0.23 (4.56)
Log(SALE)	-6.63 (-13.37)	-6.53 (-15.54)	-8.24 (-7.30)	-6.50 (-13.26)	-6.90 (-13.69)	-6.85 (-15.99)	-8.24 (-7.32)	-6.68 (-13.52)
PPE/A	-0.08 (-2.01)	-0.10 (-3.12)	-0.12 (-1.66)	-0.05 (-1.36)	-0.07 (-1.81)	-0.09 (-2.81)	-0.12 (-1.66)	-0.04 (-1.10)
RD/A	0.31 (3.39)	0.28 (3.25)	0.34 (1.82)	0.31 (3.19)	0.29 (3.20)	0.27 (3.05)	0.34 (1.82)	0.30 (3.12)
Dummy: missing RD	-0.92 (-0.56)	-1.50 (-0.98)	-2.55 (-0.72)	0.18 (0.10)	-1.23 (-0.75)	-1.70 (-1.12)	-2.55 (-0.72)	0.02 (0.01)
LEV(pre-IPO)	-0.06 (-1.70)	-0.03 (-0.82)	-0.16 (-2.10)	0.00 (-0.12)	-0.06 (-1.77)	-0.03 (-0.92)	-0.16 (-2.10)	0.00 (-0.12)
AdjRSq	0.33	0.35	0.46	0.34	0.33	0.35	0.46	0.35
N	1898	2114	485	1629	1898	2114	485	1629

**Panel B: Firms with preferred shares**

	No control for credit spreads				With control for credit spreads			
	1975-1999 (1)	1975-2009 (2)	1975-1985 (3)	1986-2009 (4)	1975-1999 (5)	1975-2009 (6)	1975-1985 (7)	1986-2009 (8)
HOT	6.71 (2.32)	0.03 (0.01)	16.75 (2.11)	-1.58 (-0.73)	5.29 (1.72)	-0.56 (-0.27)	14.92 (1.80)	-2.45 (-1.07)
Default					-4.64 (-1.71)	-2.19 (-0.98)	12.84 (1.15)	-3.63 (-1.21)
MB	-0.02 (-0.25)	0.16 (1.18)	4.29 (2.03)	0.14 (1.05)	-0.02 (-0.25)	0.16 (1.17)	3.19 (1.26)	0.14 (1.05)
EBITDA/A	0.14 (3.71)	0.12 (3.72)	0.04 (0.19)	0.13 (3.85)	0.15 (3.79)	0.12 (3.77)	0.00 (-0.01)	0.13 (3.90)
Log(SALE)	-8.43 (-11.71)	-6.90 (-11.65)	-8.01 (-2.87)	-6.87 (-10.88)	-8.46 (-11.70)	-6.92 (-11.62)	-8.01 (-2.68)	-6.83 (-10.85)
PPE/A	-0.16 (-3.35)	-0.16 (-3.66)	-0.20 (-0.77)	-0.15 (-3.20)	-0.14 (-2.93)	-0.15 (-3.43)	-0.17 (-0.64)	-0.14 (-3.05)
RD/A	0.23 (3.71)	0.23 (4.22)	0.24 (0.57)	0.24 (4.30)	0.22 (3.55)	0.23 (4.14)	0.22 (0.54)	0.23 (4.27)
Dummy: missing RD	-5.09 (-1.90)	-5.38 (-2.44)	7.82 (0.55)	-5.00 (-2.26)	-4.95 (-1.87)	-5.35 (-2.44)	10.67 (0.74)	-5.03 (-2.27)
LEV(pre-IPO)	0.07 (2.00)	0.07 (2.46)	0.21 (0.78)	0.07 (2.41)	0.07 (1.91)	0.07 (2.42)	0.20 (0.72)	0.07 (2.37)
AdjRSq	0.30	0.26	0.43	0.26	0.30	0.26	0.44	0.26
N	1358	1761	126	1635	1358	1761	126	1635

**Table IA7**

**Market timing and change in capital structure in the IPO year – by type of firm**

*Description:* The dependent variable is the change in leverage relative to the year preceding the IPO: LEV-LEV(pre-IPO). *Default* equals the difference (in pct.) between the yield on 30Y BBB rated bonds and the yield on 30Y AAA rated bonds provided by Moody's and measured at the end of the month preceding the IPO. The other independent variables used in Table IA5 are included but not reported. Panels A and B report regression results by type of firm, where firms are classified according to whether they have preferred shares prior to going public. T-statistics are in parentheses; they are based on standard errors that are robust to heteroskedasticity.

*Interpretation:* Inferences about hot-issue market timing effects on capital structure for firms without preferred shares are sensitive to the sample period and whether controls for credit-market conditions at the time of the IPO are included in the regression. Hot-issue markets have no impact on IPO-year leverage for firms with preferred shares, regardless of credit market conditions at the time of the IPO.

**Panel A: Firms without preferred shares**

Time:	No control for credit spreads			With control for credit spreads		
	IPO (1)	IPO+1 (2)	IPO+2 (3)	IPO (4)	IPO+1 (5)	IPO+2 (6)
	<i>Sample period: 1975-1999</i>					
HOT	-2.43 (-2.38)	-2.47 (-1.86)	-0.22 (-0.15)	-1.19 (-1.13)	-1.19 (-0.88)	0.70 (0.46)
Default				3.09 (3.82)	3.27 (3.18)	2.35 (2.13)
AdjRsq	0.53	0.47	0.47	0.53	0.47	0.47
N	1898	1768	1585	1898	1768	1585
	<i>Sample period: 1975-2009</i>					
HOT	-1.79 (-1.96)	-0.42 (-0.39)	0.94 (0.80)	-0.65 (-0.70)	0.81 (0.74)	1.89 (1.55)
Default				3.71 (4.77)	4.03 (4.13)	3.18 (3.05)
AdjRsq	0.51	0.47	0.46	0.52	0.47	0.46
N	2114	1973	1769	2114	1973	1769
	<i>Sample period: 1975-1985</i>					
HOT	-3.71 (-2.13)	-3.41 (-1.59)	-2.13 (-0.95)	-3.53 (-1.97)	-3.77 (-1.82)	-3.02 (-1.34)
Default				0.73 (0.39)	-1.36 (-0.62)	-4.01 (-1.66)
AdjRsq	0.54	0.39	0.43	0.54	0.39	0.43
N	485	466	423	485	466	423
	<i>Sample period: 1986-2009</i>					
HOT	-1.07 (-0.90)	1.48 (1.14)	2.67 (1.88)	0.40 (0.32)	2.92 (2.15)	4.08 (2.74)
Default				7.22 (4.54)	7.08 (3.70)	6.73 (3.18)
AdjRsq	0.51	0.49	0.48	0.52	0.50	0.49
N	1629	1507	1346	1629	1507	1346

**Panel B: Firms with preferred shares**

Time:	No control for credit spreads			With control for credit spreads		
	IPO (1)	IPO+1 (2)	IPO+2 (3)	IPO (4)	IPO+1 (5)	IPO+2 (6)
	<i>Sample period: 1975-1999</i>					
HOT	-2.49 (-1.67)	2.25 (1.53)	3.31 (1.73)	-1.91 (-1.24)	2.85 (1.85)	3.94 (1.98)
Default				1.92 (1.60)	2.17 (1.43)	2.33 (1.25)
AdjRsq	0.65	0.654	0.64	0.65	0.654	0.641
N	1358	1228	1054	1358	1228	1054
	<i>Sample period: 1975-2009</i>					
HOT	-0.94 (-0.89)	2.42 (2.16)	2.47 (1.85)	-0.55 (-0.50)	2.76 (2.35)	2.86 (2.05)
Default				1.46 (1.41)	1.34 (1.01)	1.60 (1.05)
AdjRsq	0.65	0.646	0.644	0.65	0.646	0.644
N	1761	1586	1382	1761	1586	1382
	<i>Sample period: 1975-1985</i>					
HOT	-4.21 (-1.41)	4.15 (1.20)	-1.56 (-0.28)	-4.00 (-1.33)	5.06 (1.42)	-0.08 (-0.01)
Default				-1.44 (-0.32)	-7.68 (-1.33)	-9.24 (-1.10)
AdjRsq	0.79	0.60	0.45	0.78	0.61	0.46
N	126	116	105	126	116	105
	<i>Sample period: 1986-2009</i>					
HOT	-0.48 (-0.43)	2.39 (1.96)	2.64 (1.89)	-0.19 (-0.16)	2.42 (1.87)	2.73 (1.84)
Default				1.23 (0.82)	0.14 (0.08)	0.36 (0.20)
AdjRsq	0.65	0.66	0.65	0.65	0.66	0.65
N	1635	1470	1277	1635	1470	1277