

Security Choice and Corporate Governance

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Abstract

The most efficient corporate governance structure will vary by firm depending on the costs and benefits of different governance mechanisms. For IPO firms that must select the type of equity offering, Schultz (1993) contends that warrants in equity offerings reduce agency conflicts. We conjecture that IPO firms issue warrants as a substitute for a less effective corporate governance structure, similar to the dividends-as-substitutes argument of Officer (2006). We examine a sample of unit IPO firms (firms issuing warrants with shares) matched to a comparable set of shares-only firms and show that warrants act as a substitute for other governance mechanisms.

Keywords: Corporate governance, Agency costs, IPOs, Warrants, Board of directors

JEL Classification: G34, L22

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1. Introduction

Firms use corporate governance mechanisms to reduce the agency conflicts between owners and managers of the firm. The various corporate governance mechanisms available to the firm involve costs and benefits, meaning the most efficient governance structure may vary by firm (Gillan, Hartzell, and Starks, 2006). For IPO firms, managers decide on the method of issuance, which may include shares only or shares with warrants. Schultz (1993) contends that IPO firms issue shares with warrants to reduce the agency costs associated with the proceeds received. Considering warrants as a corporate governance mechanism for IPO firms, a question arises regarding how warrants fit within the overall governance structure of the firm. Warrants may substitute for or complement other corporate governance mechanisms used by the firm. We contend that firms choose their offering method based on the recognition that warrants act as a corporate governance mechanism, and we posit that warrants substitute for other corporate governance characteristics of IPO firms.

La Porta et al. (2000), hereafter LLSV, test two opposing hypotheses related to the payout of dividends by firms. The outcome hypothesis predicts that firms in countries with strong shareholder rights have greater dividend payout ratios because the mechanisms are in place for shareholders to force insiders to disgorge cash. The substitution hypothesis predicts that firms in countries with weak shareholder rights have greater dividend payout ratios because firms need to build a reputation of good treatment of shareholders, and paying dividends is one method of showing such a reputation. The authors find support for the outcome hypothesis; dividend payments complement shareholder rights.

Officer (2006) tests the LLSV hypothesis, applying the concept to the predicted payers of dividends in the U.S. and finds support for the substitution hypothesis. Firms with weaker

corporate governance structures disgorge more cash, i.e., dividend payouts substitute for other corporate governance mechanisms of the firm. Firms with higher payout ratios have large boards, one person holding the CEO and board chairman positions, low insider equity ownership, and low institutional equity ownership. Officer also finds that predicted dividend payers with weak governance structures have more positive dividend initiation announcements than do firms with strong governance structures. The results suggest that the decision to pay dividends depends on the agency conflicts that exist within the firm.

The equity offering method decision made by IPO firms may also depend on the agency conflicts existing in the firm. Schultz (1993) likens IPO firms that issue shares with warrants to firms receiving venture capital support. These firms must reach specific goals set by the venture capital backer to advance into the next phase of development and receive additional funds. IPO firms that issue shares and warrants receive a reduced amount of proceeds and must prove to the market that the firm has viable economic prospects. If the market agrees, the firm's stock price increases. As the stock price reaches the warrant exercise price, warrant holders exercise their holdings and provide firms with additional funds. Firms issuing warrants receive less cash at the IPO, mitigating the free cash flow effects described by Jensen (1986).

IPO firms that issue warrants are smaller, younger, and riskier than are firms that issue shares only (Schultz, 1993; Jain, 1994; How and Howe, 2001). Warrant-issuing IPO firms are also more likely to sell a larger portion of the firm's equity in the IPO than are shares-only IPO firms. The agency-cost-minimization hypothesis supported by Schultz (1993) shows that a younger, smaller, and riskier firm has greater difficulty determining if the firm has worthwhile projects to pursue. In addition, if the firm sells a larger fraction of the equity in the IPO, agency costs become a bigger concern because insiders have reduced incentives to act in the best interest

of shareholders. The systematic difference between warrant-issuing and shares-only IPO firms suggests that the decision to issue warrants at the IPO depends on the agency conflicts within the firm, similar to the dividend payout decision explored by Officer (2006).

We examine a sample of unit IPO firms, or firms that issue shares with warrants at the IPO, and compare them to shares-only IPO firms, matching the firms based on industry, size, and offering date. Using a method to account for the potential selection bias of the sample firms, we find that firms issue warrants at the IPO to substitute for a less effective, or weaker, corporate governance structure. Unit IPO firms have a smaller fraction of outsiders on the board, have outsiders on the board that own a smaller fraction of the firm's equity, and are less likely to have a separation of the leadership positions, i.e., one person will likely hold both the CEO and board chairman posts. Unit IPO firms also have external blockholders that own a smaller fraction of the firm's equity, and these firms enter the IPO with less debt, reducing the potential monitoring role of large shareholders and creditors. Finally, unit IPO firms have smaller boards than do shares-only IPO firms, which is not consistent with the basic contention. However, unit IPO firms exhibit characteristics of IPO firms that have small boards, being young, small, and risky. This finding suggests that firm characteristics outweigh the offering type decision made by the firm.

Our findings are consistent with the argument that warrants offered with shares at the IPO reduce the agency conflicts arising from the free cash flow received as proceeds (Schultz, 1993; Jensen, 1986). These findings also contribute to the discussion by Gillan, Hartzell, and Starks (2006), who argue that research examining the interrelation among corporate governance mechanisms is incomplete. Just as Officer (2006) shows that dividends act as a corporate

governance mechanism and substitute for a strong shareholder presence, we show that warrants act as a substitute governance mechanism for firms with greater agency conflicts.

2. Testable hypotheses

If warrants substitute for other corporate governance mechanisms of IPO firms, we expect unit IPO firms to have a less effective corporate governance structure than shares-only IPO firms. As an internal governance mechanism, the board of directors receives a large share of research attention. The extant literature identifies less effective boards as boards that are larger (Jensen, 1993; Yermack, 1996) and less independent (Weisbach, 1988; Hermalin and Weisbach, 1998). Studies suggest that low equity ownership of independent board members signifies less effective governance (Jensen and Meckling, 1976; Morck, Shleifer, and Vishny, 1988; Bhagat, Carey, and Elson, 1999). Hermalin and Weisbach (2003, p.18) describe the independence of the board of directors from the CEO as “probably the most important factor determining a board’s effectiveness.” Firms without a separation of leadership exhibit less effective governance (Jensen, 1993; Beatty and Zajac, 1994).

Hypothesis 1: The board of directors of unit IPO firms will have fewer members than the board of directors of shares-only IPO firms.

Hypothesis 2: The board of directors of unit IPO firms will have a smaller fraction of outsiders than will the board of directors of shares-only IPO firms.

Hypothesis 3: The fractional equity holdings of outside directors of unit IPO firms will be smaller than the fractional equity holdings of outside directors of shares-only IPO firms.

Hypothesis 4: The likelihood of one person holding both the CEO and chairman positions will be greater for unit IPO firms than for shares-only IPO firms.

External governance mechanisms also help determine the strength of the firm's governance structure. Low equity ownership of unaffiliated external blockholders identifies a reduced monitoring role, or less effective governance (Shleifer and Vishny, 1986; Denis, Denis, and Sarin, 1997). Also, firms with less debt entering the IPO do not benefit from the potential monitoring role of banks and other creditors (Diamond, 1984; Fama, 1985; James, 1987).

Hypothesis 5: The fractional equity holdings of external blockholders of unit IPO firms will be smaller than the fractional equity holdings of external blockholders of shares-only IPO firms.

Hypothesis 6: The debt levels of unit IPO firms will be less than the debt levels of shares-only IPO firms.

3. Data

We develop a comprehensive hand-collected dataset by first downloading all unit IPOs from Thomson Financial's *SDC New Issues* database occurring between 1996 and 2004, yielding 160 unit offerings. Jay Ritter's website¹ identifies 34 stock-plus-warrant IPOs incorrectly classified as shares-only IPOs. From the 194 offerings in the initial sample, we eliminate 62 issues because of the inability to obtain prospectuses, of which 36 are from issues before May 6, 1996. Beginning at this date, the Securities and Exchange Commission (SEC) requires firms to submit all forms electronically, while prior to this date, electronic submission was voluntary.

¹ <http://bear.cba.ufl.edu/ritter/ipodata.htm>

We match each unit IPO firm with a shares-only IPO firm within the same two-digit SIC code that issued shares within 12 months of the unit IPO. We select the shares-only IPO firm with the closest market value of equity (number of shares outstanding following the offer times the offer price) and an available prospectus. Following this matching process and the subsequent review of prospectuses from the matching firms, we identify firms incorrectly labeled within *SDC*, resulting in an additional 12 firms for the sample. The final sample of unit IPO firms consists of 144 firms. We obtain board, ownership, and offering data from firm prospectuses. Other firm characteristics and stock price data originate from 10-K filings, the Center for Research in Security Prices (CRSP), Compustat, and Standard & Poor's *Daily Stock Price Record*.

3.1. The offering

Table 1 provides details of the offerings for the unit and matched sets. Unit IPO firms offer more shares when considering the sum of the initial shares offered at the IPO and the shares offered through the warrants issued. The median shares-only firm offers two million shares, and the average unit IPO firm offers 1.28 million shares at the IPO, but 2.8 million when including the warrant exercise. This relation is reinforced when examining the fraction of equity offered at the IPO. The potential equity fraction offered by the median unit IPO firm, which includes the initial offering shares plus the potential shares from warrant exercise, is 110% of the existing outstanding shares entering the IPO.² Shares-only IPO firms offer half that fraction, issuing 52% of the firm. Unit firms issue shares at lower prices (\$5.75 vs. \$8.00), yielding less than half the

² We use the term “potential” to describe the inability of IPO firms to predict if warrant holders will have the opportunity to exercise their warrants in the future.

proceeds at the IPO (\$7.25M vs. \$16M), reaffirming the fact that initial proceeds for firms issuing unit IPOs are less than the proceeds for their traditional shares-only counterparts.

The exercise price for issued warrants is typically 20% above the offer price of shares at the IPO, requiring the firm to prove to the market its future growth prospects are viable, as described in the staged financing scenario of Schultz (1993). Further inspection finds that 29 unit IPO firms issue warrants with an exercise price at or below the share offer price. While these warrants are not immediately exercisable, one must consider these offerings with suspicion. If insiders are less than confident that their firm has viable economic prospects desired by the market, one way to obtain additional funds more quickly is to issue warrants at or in the money. Examining the 29 firm sets issuing warrants at or in the money and comparing them to the other 115 firm sets provides no distinct differences in the firm or governance characteristics. The remaining analyses and conclusions discussed below are also unaffected.

Schultz (1993) finds a general tendency for unit IPO firms to employ underwriters of lower reputation than firms that issue shares only. Carter and Manaster (1990) establish an ordinal ranking for underwriters based upon the location in a filing's tombstone announcement. Firms higher on the tombstone list receive larger numbers (the underwriter listed first receives a rating of nine, the second eight, and so on), i.e., the higher the rating integer, the more reputable the underwriter. We obtain the underwriter reputation rankings from Jay Ritter's website (see footnote 1), which updates the Carter-Manaster sample to include underwriters managing equity offerings through 2004.³ In our sample, unit IPO firms use underwriters with lower Carter-Manaster ratings than their shares-only counterparts (3.1 vs. 6.1).

³ We apply Ritter's notation and add 0.1 to the ranking integers to aid other researchers in distinguishing his updated rankings from Carter and Manaster (1990) and Carter, Dark, and Singh (1998).

Unit IPO firms establish a median life of 5 years for the warrants offered. Day one returns, or underpricing, for unit IPO firms are higher for the average firm, but not statistically significant. The 3.8% return for the median unit IPO price is more than double the 1.78% return found by Jain (1994). Similar to our sample, Jain did not find a statistical difference between the underpricing of unit IPO firms and shares-only firms.

3.2. Firm characteristics

Referring to Table 2, the median market value for the unit IPO firm set (\$19.4M) and the matched shares-only IPO firm set (\$22.1M) are quite similar despite a larger difference in the means (\$35.99M for the unit set, \$53.33M for the matched set). The difference-in-means test shows no statistical difference in the two sets, although the difference-in-medians test does show that the sample is different statistically at the 5% level. The matching algorithm should result in similar values for the market value because the value is one of the matching criteria. Missing prospectuses results in larger market value differences. Restricting the market value match to be within $\pm 30\%$ does not alter the result. Tighter restrictions (as low as 15%) also does not change our conclusions.

Unit IPO firms are smaller, riskier, and younger than are shares-only firms, consistent with prior literature (Schultz, 1993; Jain, 1994; How and Howe, 2001). In addition to a smaller market capitalization, unit IPO firms have a lower asset value (median \$7.03M) compared to shares-only IPO firms (\$30.21M). We measure risk in two ways. Barry, Muscarella, and Vetsuypens (1991) identify the volatility of returns immediately following the offering acts as a good proxy for *ex ante* uncertainty. Consistent with their definition, we use the standard deviation of stock returns from the first 20 trading days subsequent to the IPO, excluding the first

day. The median standard deviation of returns is 0.048 for unit IPO firms compared to 0.036 for shares-only IPO firms, significantly different at the 1% level.

The second risk measure is the *Zscore*, defined by Mutchler (1985) and used by Feroz et al. (2006) to evaluate firm-specific risk measures of IPO firms. Mutchler defines the *Zscore* relation as follows:

$$\begin{aligned} Zscore = & 0.120 * \frac{Net\ Worth}{Total\ Liabilities} + 0.159 * \frac{Operating\ Cash\ Flows}{Total\ Liabilities} \\ & + 0.132 * \frac{Current\ Liabilities}{Current\ Assets} - 0.032 * \frac{Long\ term\ debt}{Total\ Assets} \\ & - 0.138 * \frac{Total\ Liabilities}{Total\ Assets} + 0.187 * \frac{Net\ Income\ before\ taxes}{Sales} \end{aligned}$$

Firms in financial distress will have a *Zscore* less than zero, while a positive *Zscore* indicates a healthy firm. This relation provides another useful metric for risk when considering the limited pre-IPO data available for researchers. As expected, unit IPO firms have a significantly lower *Zscore* than do shares-only IPO firms. The median *Zscore* for the unit IPO set is -0.28, indicating the typical unit IPO firm is in financial distress. By contrast, the median *Zscore* for the shares-only IPO set is 1.47, depicting financial health, and supporting the conclusion that unit IPO firms are riskier than shares-only IPO firms.

We define firm age as the number of years from firm incorporation to the offering. Unit IPO firms have a median age of 7.75 years while shares-only IPO firms' median age is 11.08 years. Ritter (1991) uses firm age as a proxy for the uncertainty of firms entering the IPO. With this in mind, the firm age comparison indicates that unit IPO firms are younger and riskier. Asset tangibility, measured as the value of property, plant, and equipment divided by total assets, is significantly lower for unit IPO firms (median of 0.090 vs. 0.111). Unit IPO firms are less

likely to originate as a component of a parent firm, as indicated by the carve-out / spin-off dummy variable, and offer greater growth opportunities when measured with the market-to-book ratio (median of 2.50 vs. 0.88), statistically different at the 1% level.

Several firms either fail to disclose the level of R&D spending through Compustat or have zero spending. For the 125 firms without R&D data, we review the prospectus and the subsequent four quarterly SEC filings. Prospectuses for 26 firms include R&D data. For the remaining 99 firms, the quarterly filings did not have R&D data, so we conclude that R&D spending for these firms equals zero. Current U.S. GAAP dictates disclosure of aggregate R&D expenditures, providing confidence in our assumption. The two sets of firms are not statistically different in their R&D spending intensity, defined as the amount of R&D spending divided by total assets. After removing firms without R&D expense identified in the SEC filings, the two samples differ significantly in their mean R&D intensity, but not in their median intensity values.

The operating cash flow to sales ratio for unit IPO firms compared to shares-only IPO firms is statistically lower (median of -0.44 vs. -0.03), providing another indication of the financial risk faced by unit IPO firms as they go public. Nineteen firms report zero revenues, making the calculation of the cash flow to sales ratio impossible. For these firms we assume the ratio equals zero. The findings are robust to the exclusion of these 19 firms.

4. Univariate results

To evaluate the six hypotheses, we first compare governance characteristic data for the unit set to the matched set, evaluating the statistical significance between the unit IPO firms and their corresponding shares-only IPO matched firms. Table 3 describes the board characteristic, ownership, and debt data for the 144 matched sets (288 firms) in the sample.

The first hypothesis states that the board size for unit IPO firms is larger than for shares-only IPO firms. In the sample, the unit set median board size is one director less (5) than the matched set median board size (6). The mean size differs by 0.99, with the mean and median difference tests statistically significant at the 1% level. The first prediction is not consistent with the results. The difference in board size is only one director different in size between the two boards, perhaps calling into question the economic significance of this parameter. Another possible explanation for the board size difference lies with the matched firm set. As firms age and grow, the board of directors also grows in size (Baker and Gompers, 2003; Boone et al., 2004). Recall from Table 2 that the shares-only IPO firms are older and larger than are unit IPO firms, suggesting that the typical unit IPO firm will have a smaller board no matter the offering method used at the IPO. We revisit the board size comparison in Sections 5.4 and 5.5.

The second hypothesis states that unit IPO firm boards are less independent than are shares-only IPO firm boards. In other words, the fraction of independent outside directors on the boards of the unit set will be less than the fraction on the boards of the matched set. We follow the general convention in the literature (e.g., Yermack, 1996) in categorizing the members of the board. Inside directors are current executives of the firm. Gray directors include any former firm executives, founders of the firm, board members involved in business or legal arrangements with the firm, and any board member with a familial relation with an insider, gray director, or other firm employee. We categorize any board members not defined as insiders or grays as independent outside directors, or more simply, outsiders.

From Table 3, the median unit IPO firm typically has one less outsider on its board compared to the median shares-only IPO firm. The resulting degree of independence follows this trend, with a statistically significant (at the 1% level for the mean and median) lower degree

of independence for the unit set compared to the matched set. The median (mean) level of independence is 40% (35.4%) for unit IPO firms and 50% (47.5%) for shares-only IPO firms. Reviewing the board size difference, shares-only IPO firms appear to make up the difference in board size by having an additional outside director. Although the data do not fully support the first hypothesis regarding board size, the composition of the shares-only board in general reflects better governance characteristics than does the unit board.

The third hypothesis states that the outside directors on the boards of unit IPO firms beneficially own a smaller percentage of their firm's shares compared to the outside directors of shares-only IPO firms. Table 3 provides the equity holdings subsequent to the offering and shows that outside directors of unit IPO firms hold a statistically significant smaller fraction of their firm's outstanding shares. Board outsiders own a median of 0% (mean = 3.5%) of the unit IPO firm compared to 1.6% (mean = 8.2%) of the shares-only IPO firm. The alignment of incentives between shareholders and outsiders on the board is worse for unit IPO firms than for shares-only IPO firms because of the reduced equity holdings. In addition, in the bargaining hypothesis of Hermalin and Weisbach (1998), the smaller fraction of outside director ownership for unit IPO firms translates into less power in the relationship with the firm's CEO.

The fourth hypothesis states that unit IPO firms are less likely than are shares-only IPO firms to separate the posts of board chairman and firm CEO into two distinct positions. A dichotomous variable distinguishes the separation of leadership within a firm. If there is a separation of leadership and two people hold these positions (one in each), the firm receives a value of one. If one person holds both positions, the firm receives a value of zero. With this definition, the hypothesis predicts the separation of leadership variable for the unit IPO set to be less than the variable for the matched shares-only IPO set. Table 3 shows that the difference in

the separation of leadership between the unit set and the matched set is not significant, with the mean values of the separation dichotomous variable nearly equal. The prospectuses for 24 firms fail to clearly identify a board chairman. For the 24 firm sets where one or both firms did not identify a board chair, we take the conservative position and assume a value of zero, i.e., one person holds both positions. After removing these firms from the sample, the median value of the separation of leadership variable for the unit IPO set is 0.37 and for the shares-only IPO set the value is 0.41, not significantly different from each other and quantitatively similar to the full sample results.

The fifth hypothesis states that the fraction of the firm's equity owned by external blockholders will be smaller for unit IPO firms than for shares-only IPO firms. We quantify blockholder ownership by summing the equity fractions owned by unaffiliated external blockholders, who each hold at least 5% of the firm, subsequent to the offering. In Table 3, the median blockholder ownership for unit IPO firms (0.057) is smaller than the ownership of shares-only IPO firm blockholders (0.081), although this difference is not statistically significant. Other measures of blockholder presence, including the number of external blockholders subsequent to the offering and the ownership of the largest blockholder only, provide quantitatively similar results.

The sixth hypothesis states that debt levels of unit IPO firms will be less than debt levels of shares-only IPO firms. We measure a firm's debt level using total liabilities of the firm and the ratio of total debt to equity. The median unit IPO firm holds \$2.75M in total liabilities on the balance sheet, compared to a significantly higher value of \$7.22M for the median shares-only IPO firm. The median debt/equity ratio for unit IPO firms is 0.149, significantly smaller at the

1% level than the ratio for shares-only IPO firms, 0.249. Using long-term debt instead of total debt provides similar results.

5. Two-stage switching regression⁴

In this study, self-selection can occur because of our sample firms and their decision to issue warrants at the IPO. The effects of selection bias relate to the inability, for example, to estimate how much equity a unit IPO firm's external blockholder would have owned had the firm issued shares only at the IPO. In the presence of selection bias, estimating regression models using OLS could produce inefficient and inconsistent estimates. To address this issue, we employ a two-stage switching regression method.⁵ The first stage of the procedure estimates the offering type decision for the total sample using probit analysis.

$$OT_i^* = aZ_i - e_i \quad (1)$$

OT^* is a latent variable representing the firm's offering type choice either to issue units at the IPO ($OT = 1$ iff $OT^* \geq 1$) or shares only ($OT = 0$ iff $OT^* < 0$); Z is a vector of determinants representing firm characteristics that influence the offering type decision; a is a vector of coefficients; and e is a random error term.

The second stage uses OLS to estimate the governance mechanism relations,

$$GM_{ni} = b_n X_{ni} + \sigma_{ne} \left[\frac{f(aZ_i)}{1 - F(aZ_i)} \right] + w_{ni} \quad (2)$$

$$GM_{ui} = b_u X_{ui} + \sigma_{ue} \left[-\frac{f(aZ_i)}{F(aZ_i)} \right] + w_{ui} \quad (3)$$

⁴ In the interest of brevity, we provide an abridged version of a more thorough description of the two-stage switching procedure applied in our study. The detailed version is available from the authors.

⁵ Several researchers have applied two-stage switching regressions. Our method is based primarily on Lee (1978), Maddala (1991), Shehata (1991), and Dunbar (1995). Li and Prabhala (2005) provide an excellent review of applying self-selection models to corporate finance issues.

where GM_n and GM_u are observed values of the governance mechanisms if the firm decides to issue shares only or units; X_n and X_u are vectors of determinants of the governance mechanisms for the firm that issues shares only or units; b_n and b_u are vectors of coefficients; σ_{ne} and σ_{ue} represent the covariances of the random error in the relation between GM and X with the error in the decision model; f represents the standard normal density function; F represents the cumulative normal distribution function; and w_n and w_u are random error terms with $E(w) = 0$. The terms in brackets are the Mills ratios, representing the selection bias correction terms for each sample firm in the shares-only IPO and unit IPO groups. By including the Mills ratios, which adjust for selection bias, the OLS estimates of Eq. (2) and Eq. (3) generate consistent estimates of b_n and b_u . The Mills ratios measure the covariance between the offering type decision and the governance mechanism decision or state. The statistical significance of the Mills ratio coefficients provides useful information about the interrelation between the offering type decision and the governance mechanism. If the offering type choice and the size of the board, for instance, are independent (i.e., the Mills ratio coefficient is not significant), then a change in offering type does not influence the size of the board.

After completing the adjusted estimation from the OLS regression, we forecast the mean value of the governance mechanisms (the dependent variables) for the alternative offering type. We use \hat{b}_u from Eq. (2) to determine the mean value of unit IPO firms had they chosen to issue shares only at the IPO, and \hat{b}_n from Eq. (3) to determine the mean value of GM_n for shares-only IPO firms had they chosen to issue warrants at the IPO. We ignore the Mills ratio terms when forecasting the alternative offering results because the estimates already incorporate the correction for selection bias.

5.1. Explanatory variables for the offering type decision model

We review the literature on warrants to select the vector of determinants Z that influence the offering type decision for the firm at the IPO. Consistent with the findings from Schultz (1993), Jain (1994), and How and Howe (2001), firms that issue warrants with shares at the IPO are likely to be smaller, riskier, and younger than are their shares-only IPO counterparts. We use the amount of proceeds and the total assets of the firm as metrics representing the size of the firm. For the risk measure, we employ the two measures described earlier, the standard deviation of returns during the firm's first 20 days of trading (excluding day one) and the $Zscore$. Firm age is measured as the natural log of days from incorporation to the offering. Unit IPO firms are also more likely to sell a larger portion of the firm's equity in the IPO than are shares-only IPO firms. The agency-cost-minimization hypothesis supported by Schultz (1993) shows that a younger, smaller, and riskier firm has greater difficulty determining if the firm has worthwhile projects to pursue. In addition, if the firm sells a larger fraction of the equity in the IPO, agency costs become a bigger concern because insiders have reduced incentives to act in the best interest of shareholders. We also input as an offering decision determinant the rank of the underwriter based on Carter-Manaster reputational rankings.

5.2. Explanatory variables for the governance mechanism determinants models

Although the corporate governance literature is extensive, the characteristics of the governance mechanisms for an IPO firm can differ markedly from the characteristics of a more mature firm. As this study focuses on IPO firms, we rely on other IPO studies to provide the vectors of determinants for the governance mechanisms of the firms, X_n and X_u .

Baker and Gompers (2003) evaluate board characteristics at the IPO and find that board size increases with firm size, asset tangibility, and the age of the CEO, but decreases with the presence of a founder as the firm's CEO. Firms that are larger and more complex require more directors on the board, implied by the findings of Yermack (1996) and Denis and Sarin (1999). Consistent with Hermalin and Weisbach (1998), the CEO plays a strong role in shaping the composition of the board, and CEO succession issues influence board size and composition as the CEO ages. Baker and Gompers do not discuss the negative relationship between the CEO being a founder and board size. CEOs who are also founders of the firm will have significant influence in board makeup, perhaps unwilling to add outsiders to maintain control, leading to smaller boards. Boone et al. (2004) find larger boards in larger firms and in firms that spend less on R&D, an information asymmetry proxy. Firms face higher monitoring costs for the board's outside directors when information is more difficult to obtain, resulting in a smaller board size.

Baker and Gompers (2003) find that the ratio of outside directors on the board increases with the size of the firm and the presence of venture capital backing, but decreases with asset tangibility, the level of cash flows, and the tenure of the CEO. The authors posit that firms that are larger, have fewer tangible assets, have lower cash flows, and are venture capital-backed have more outsiders on the board as a result of the firm's history of needing more external financing. The decrease in board independence as CEO tenure increases is consistent with the bargaining between the CEO and board outsiders presented in Hermalin and Weisbach (1998). Boone et al. (2004) find boards with a greater degree of independence in larger firms, in venture capital-backed firms, and in firms with shorter-tenured CEOs. They also find that the ratio of outsiders on the board is higher if the CEO owns less equity in the firm, if outsiders own more equity in the firm, and if the IPO firm is not a carve-out or spin-off from a parent firm. The

equity holdings of the CEO and board outsiders represent the power held by the respective parties, again relating to the bargaining power model of Hermalin and Weisbach (1998).

Intuitively, if the firm is an equity carve-out of a parent firm, the board will most likely consist of a higher percentage of insiders rather than outsiders.

Filatotchev and Bishop (2002) argue that entrenched managers will resist creating a more diverse board and avoid providing any incentives for outsiders to gain in monitoring and control. Their results show that outsider equity ownership decreases with insider ownership.⁶ Outsiders would likely increase their equity holdings in firms with more growth opportunities and reduced risk. Alternatively, outsiders could see the IPO as a chance to liquidate all or a portion of their holdings. We add measures for growth opportunities (market-to-book) and risk (firm age, stock return volatility, and *Zscore*), and wait for the results to provide more details on the relations with outsider ownership.

Beatty and Zajac (1994) find that the likelihood of a separation of leadership decreases with the equity ownership of board insiders, implying that more monitoring is required due to the reduced incentives borne by the low equity holdings of management. The authors' arguments imply an equilibrium state within the firm. Board insiders could decide to retain a higher fraction of the firm to maintain the power and control they possess with the CEO also holding the chairman position. We add two intuitive determinants, suggesting first that if the CEO is also the founder of the firm, he is more likely to simultaneously hold the position of chairman to retain a high level of control. Second, in the presence of venture capital, the firm is more likely to have a separation of leadership because of the monitoring power held by the venture capitalist.

⁶ Filatotchev and Bishop (2002) also find significant relations between CEO experience and two of the governance mechanisms, outsider equity ownership and the separation of leadership. They define experience as the number of management positions and board memberships held over the last five years before the IPO. At the IPO, five years is longer than the lives of much of the sample, leading us to exclude these determinants from the analysis.

Pham, Kalev, and Steen (2003) examine the effects of underpricing on ownership structure, but the only significant variable determining blockholder ownership is the firm's first day return, a parameter unknown to blockholders participating in the IPO. We expect blockholders to alter their equity holdings in similar fashion as board outsiders. Using the Filatotchev and Bishop (2002) argument from the outsider ownership measures above, we expect a negative relation between blockholder ownership and insider ownership. We reserve identifying an exact relation between blockholder ownership and the remaining variables – firm risk, growth opportunities, and firm age – until after the two-stage regression analysis.

Barry and Mihov (2005) compare the performance of IPO firms based on the prevalence of debt financing versus the presence of venture capital backing. From 1980 through 2002, the median (mean) total debt to total asset ratio is 0.26 (0.33) for their sample of nearly 6,000 firms. These numbers are encouraging when comparing them to our statistics (not reported), but the Barry and Mihov study and other research are limited in their evaluation of the determinants of debt financing for firms approaching the IPO. Debtholders are more likely to provide financing to firms with less risk and less information asymmetry. We define high-risk firms as younger firms; firms with higher standard deviation of returns in the first 20 days of trading after the IPO, excluding the first day; and firms with lower *Zscore*. High R&D intensity captures information asymmetry (Gompers, 1995). Firms with more stable cash flows are more likely to pay off debts, but our dataset lacks the quantity of years to adequately measure cash flow variance. We add the cash flow to sales ratio in an attempt to quantify this parameter. Finally, debtholders are more likely to finance firms in which insiders hold limited power, defined in our model with the equity ownership of insiders subsequent to the IPO.

Table 4 provides descriptive statistics of firm characteristics related to the governance mechanisms detailed above. Of the four CEO traits examined, only the equity holdings of the CEO are significantly different between the two types of firms. CEOs of unit IPO firms own 14.6% (median) of the firm compared to 9.4% for shares-only CEOs. The two CEO groups are similar in age and tenure, as well as the likelihood of the CEO being a founder of the firm. Related to CEO holdings, the equity ownership of insiders as a whole is significantly larger in unit IPO firms. Consistent with Schultz (1993) and How and Howe (2001), unit IPO firms sell a greater percentage of equity at the IPO, yet insiders retain more compared to insiders of shares-only IPO firms. Further examination shows that insiders other than the CEO own a statistically similar fraction of equity for either type of firm. Whether the level of equity ownership by the unit IPO firm CEO indicates entrenchment or alignment (Morck, Shleifer, and Vishny, 1988) is an open question outside the scope of this analysis. Unit IPO firms are less likely to have the presence of venture capital within the firm, which seems intuitive since unit IPOs act in a similar manner as the staged financing of venture capital (Schultz, 1993).

5.3. Expectations for the Mills ratio

The two-stage switching regression method allows for three tests of the overall hypotheses developed earlier. For the first test, the offering type decision model in Eq. (1) analyzes the expectations related to the type of firm choosing to issue warrants at the IPO. Based on the extant literature, we expect smaller, younger, and riskier firms to be more likely to issue warrants at the IPO.

The second test evaluates the six hypotheses based on the relation of corporate governance structure and the offering type decision. In general, these hypotheses state that the

corporate governance structure, represented by six different mechanisms, is a less effective structure than it would have been if warrants had not been used. To restate, when the firm incorporates a less effective corporate governance structure, the firm is more likely to issue warrants at the IPO.

The third test relates to the Mills ratio coefficients when estimating Eq. (2) and Eq. (3). The sign and significance of these coefficients indicates the degree and direction of any selection bias inherent in the sample. Since it is difficult to generalize when examining six different governance mechanisms, we will use board size to describe the expectations associated with the Mills ratio coefficients. If firms use warrants at the IPO when board size is high as hypothesized, then the errors in Eq. (3) should be positive when the error in Eq. (1) is negative, leading to a negative coefficient on the Mills ratio. If firms do not use warrants when board size is low, then the errors in Eq. (2) should be negative when the error in Eq. (1) is positive, leading to a negative coefficient on the Mills ratio. A significant coefficient on the Mills ratio indicates selection bias.

5.4. Empirical results of the bias correction

We apply the two-stage switching regression procedure to each of the governance mechanisms from the hypotheses: board size, the ratio of outsiders on the board, the fraction of the firm owned by the outsiders, the separation of leadership, the fraction of the firm owned by external blockholders, and the amount of debt. In the first stage, the probit analysis provides estimates of the offering type decision for the entire sample. Table 5 summarizes the results of the probit analysis.

Models (1), (2), and (3) use the natural log of proceeds as the proxy for firm size, which is statistically significant in each model. The variability of returns is also significant while our second measure of risk, the *Zscore*, does not indicate a difference in the financial health of the firm as intended. Unit IPO firms are generally younger than shares-only IPO firms. How and Howe (2001) show a significant relation here while Schultz (1993) does not. Consistent with the literature, firms that issue a larger fraction of equity at the IPO are more likely to issue warrants with shares. The decision model, unlike previous research, shows that underwriter reputation plays a significant role in determining the offering type decision. The variable *UWlow* equals 1 if the underwriter's ranking is less than 6.1, on a scale of 0.1 to 9.1, and equals 0 otherwise. Unit IPO firms are statistically (at the 1% level) more likely to have an underwriter with a low reputational rank.

Models (4), (5), and (6) use the natural log of total assets as the proxy for firm size, which is statistically significant in each model. The results are largely similar with the previous three models, excluding the non-significant coefficients associated with the return variability. For both sets of models, the results imply that the offering type decision model has good explanatory power and classificatory ability. Model (1) correctly identifies 77% of all firms, and Model (4) correctly identifies 78% of firms. In general, these results indicate that unit IPO firms are more likely to be smaller and riskier than shares-only IPO firms, and more likely to sell a higher fraction of equity while using a less reputable underwriter.

We select Model (1) from the decision model as the base model for the second stage because it correctly categorizes 95% of unit IPO firms and uses proceeds as its size measure, used previously by Schultz (1993). Using Model (4) does not alter the results. Table 6 summarizes the results of the second stage, which estimates using OLS the governance

mechanism relationships while correcting for selection bias, represented by the Mills ratios. The table also includes the uncorrected OLS regressions, providing a look at the influence of selection bias on the results. The first general observation based on comparing the results of the firms that issued units at the IPO and those that issued shares only is that these two groups exhibit different behavior with respect to the governance mechanisms analyzed. Throughout each panel in Table 6, differences in the size, sign, and significance of the various coefficients are common when comparing the OLS estimates to the bias-adjusted estimates. A second observation is the general lack of sufficient power to draw strong conclusions, but the results provide a clear indication of the governance mechanism relationships at the IPO for the alternative offering types.

Panel A of Table 6 examines the board size of the firm. The Mills ratio coefficient is negative for both the unit IPO set and the shares-only IPO set, consistent with the predictions for these coefficients, i.e., firms issue warrants when board size is high and avoid issuing warrants when board size is low. The coefficient is significant for each firm set, indicating the presence of selection bias in the sample. The coefficient on the dummy variable identifying a founding CEO is negative and significant in the unit set, implying that with a founding CEO, firms that issue units at the IPO will likely have smaller boards. For the shares-only IPO set, the age of the CEO, the tangibility of assets, and the level of R&D expenditures are important parameters. Shares-only firms with older CEOs will have larger boards. Shares-only firms with more tangible assets will have smaller boards, inconsistent with the board literature which predicts that more complex firms require larger boards. In shares-only firms, board size decreases with the intensity of R&D spending. Considering the disclosure issue previously discussed, the board

size results do not change if R&D intensity if we remove this parameter from the determinant model.

Panel B of Table 6 describes the determinants of board independence, measured as the ratio of outsiders on the board. Selection bias affects neither sample, as shown by the insignificant coefficients on the Mills ratios. CEOs with longer tenure in unit IPO firms are more likely to work with more independent boards, inconsistent with prior research that predicts the growing power of CEOs staying longer at a firm, resulting in more influence over board member selection. The equity ownership of outsiders on the board is positive and significant at the 1% level for both sets of firms, consistent with the bargaining model of Hermalin and Weisbach (1998), which suggests that if outsiders hold more power, with equity ownership as a proxy, they will have an advantage over the CEO in maintaining an independent board. Cash flows hold a stronger relationship with unit IPO firms, where unit IPO firms with lower cash flow to sales ratios have boards that are more independent.

Selection bias affects both firm sets when examining the determinants of outsider equity ownership, summarized in Panel C of Table 6. The Mills ratio coefficients are negative and significant. While the significance of the coefficient implies selection bias effects, the sign is not consistent with the prediction that firms issue warrants when outsider equity ownership is low and issue only shares when ownership is high. The age of the firm and the equity ownership by insiders are significant parameters for both sets of firms. Outsiders on the boards of older firms own a larger portion of the firm's equity. We use age in this instance as a proxy for firm risk. This relation suggests that outsiders will own more of a lower risk firm. This relation is mitigated by the ownership level of insiders, as is evident in the results. For unit IPO firms, higher levels of growth opportunities lead to reduced equity ownership by board outsiders,

implying that outsiders on the board may see the IPO as an opportunity to cash out despite the firm's prospects.

In Panel D of Table 6, selection bias is negative and significant for the shares-only IPO set, inconsistent with the prediction that firms issue only shares when the likelihood of a separation of leadership is also high. For unit IPO firms, the coefficient on the equity ownership of inside directors is negative and significant, implying that when insiders on the board are more powerful, the CEO will likely also be the board chairman. For shares-only IPO firms, if the CEO is a founder of the firm, she is more likely to hold both leadership positions.

Panel E of Table 6 provides estimates for the OLS regressions on blockholder presence. Selection bias affects the unit IPO set, which has a negative and significant coefficient on the Mills ratio. We expect firms to issue warrants when blockholder ownership, which proxies for the level of external monitoring over firm management, is lower, but a positive Mills ratio coefficient should be the result. The equity ownership of insiders is negative and significant for both firm sets, implying overall that blockholder ownership decreases as insider ownership increases, an intuitive and expected result. Blockholders will own less of unit IPO firms that are more financially healthy, indicated by the *Zscore* coefficient (negative and significant). This result appears counter-intuitive, but may suggest that blockholders use the offering as an opportunity to liquidate their holdings. By contrast, blockholders will own more of shares-only IPO firms with greater growth opportunities (positive and significant coefficient).

The Mills ratio is not significant in the debt regressions, described in Panel F of Table 6, signifying the absence of selection bias effects related to debt. For both sets of firms, greater risk measured using the volatility of stock returns is associated with lower debt/equity ratios, consistent with the expectation that debtholders will avoid riskier firms. Greater information

asymmetry in shares-only IPO firms, proxied by R&D intensity, leads to lower debt/equity ratios as expected. Also consistent with expectations, shares-only firms with higher cash flows per sales receive more debt.

The results of the OLS regressions described above suggest that the two sets of firms differ in their characteristics, corporate governance structures, and the inter-relations therein. Because of these differences, a method such as the two-stage switching regression, which accounts for selection bias in a sample, is necessary.

5.5. Empirical results for the alternative offering types

The analysis of the unit IPO set, the shares-only IPO set, and the governance relations between the two sets are incomplete at this point. The previous step, which tested for selection bias in the sample, precedes estimating the means for the governance mechanisms for the alternative offering type decision (Maddala, 1991). Table 7 summarizes forecasts of the expected values of the different governance mechanisms for unit IPO and shares-only IPO firms had they decided to use the alternative offering type, describing the relationships using the two-stage switching regressions and the OLS regressions.

If all firms had used the same offering type, the unit offering would be associated with smaller boards (4.61 directors) compared to the shares-only offering (7.13 directors). Reviewing the two-stage estimates for each offering type, the use of warrants at the IPO is associated with smaller boards overall. The OLS estimates show that the difference in board size between the two groups is even larger for the two samples after adjusting for the selection bias. The univariate and multivariate methods show that the boards for unit IPO firms are smaller, inconsistent with the initial hypothesis. Reviewing the descriptive statistics from Table 2, firms

that issue units at the IPO are smaller, younger, and riskier firms compared to their shares-only counterparts. These three characteristics represent traits of smaller boards. In fact, unit IPO firms possess many traits associated with small boards. In their study of IPO boards, Baker and Gompers (2003) find that smaller boards are more likely for firms that are smaller and have lower asset tangibility. The IPO study by Boone et al. (2004) finds that firms that are smaller, have more growth opportunities, have greater return volatility, and are younger will have smaller boards. The characteristics of unit IPO firms appear to outweigh the governance mechanism traits of the unit IPO offering choice in determining the size of the board.

The degree of independence of the board for the two-stage estimates exhibits the same directional relationship as the OLS estimates. Lower ratios of outsiders on the board are clearly associated with unit IPO firms. The OLS estimates are similar to the two-stage estimates, a result of the absence of selection bias related to the board independence mechanism. The results hold when defining board independence as the number of outsiders on the board rather than the ratio.

The fraction of equity owned by board outsiders is consistent with our hypothesis that unit IPO firms have a lower fraction of outsider ownership compared to shares-only IPO firms. The selection bias adjustment in the OLS regressions results in varying effects on the coefficients for outsider ownership in the switching regressions. The amount of risk plays a large role with the fraction of equity ownership by outsiders on the board, with a large positive coefficient for the shares-only firms compared to a negative coefficient for the unit firms. The OLS estimates show that outsider ownership is lower for unit IPO firms, a disparity that increases when taking into account the selection bias with the two-stage estimates.

For the separation of leadership mechanism, the bias from selectivity is clearly evident because the coefficients for each variable differ depending on the offering type decision. Also recall from the univariate results that no distinguishable difference in the separation parameter was evident between the unit IPO and shares-only IPO sets. This relation repeats in Table 7 for the OLS estimates, showing mixed results for this mechanism. According to OLS, the likelihood of separation of leadership decreases if all firms had chosen to issue warrants, but the estimates show that unit IPO firms and shares-only IPO firms would increase the likelihood by choosing the alternative offering method. The bias-adjusted results show a decreased likelihood of leadership separation if firms had chosen to issue warrants at the IPO, consistent with our fourth hypothesis.

When examining the switching results for blockholder presence, the results shadow those for the separation of leadership. The univariate data show external blockholders owning less of unit IPO firms, but the difference is not statistically significant. The OLS regressions show mixed results. Shares-only firms would have increased blockholder ownership if they had chosen to issue units instead, but blockholders would have owned more in shares-only firms when looking at the results for all firms and for unit IPO firms. Adjusting for selection bias clarifies the relation, showing the blockholder ownership is lower when firms select to offer warrants at the IPO. The results hold when quantifying blockholder presence as the number of blockholders rather than their corresponding equity ownership levels.

We discover some sensitivity in the blockholder results after ignoring financial firms, which is standard practice for most studies. We retain these firms to bolster our sample because our contention should not change for firms in this industry. After removing financial firms, shares-only IPO firms would have greater blockholder ownership if they had issued warrants at

the IPO, in contrast to the original results. Examining the data and the OLS regressions correcting for selection bias does not provide a clear reason why the shift occurs. The coefficient on the Mills ratio for both firm sets is not significant, eliminating the possibility of an increased sensitivity in the relation between the blockholder presence mechanism and the offering type decision. When measuring blockholder presence as the number of blockholders rather than their aggregate ownership, the original results hold.

The OLS estimates show that debtholders prefer investing in shares-only IPO firms when reviewing the all-firms and shares-only-IPO-firms datasets. By contrast, debtholders avoid unit firms if they had instead issued shares only. These results are inconsistent with our hypothesis. The selection-bias adjusted coefficients applied in the two-stage estimates make the results clear and consistent. In all cases, debtholders avoid firms that issue warrants at the IPO.

Finally, we consider the distributions of the governance mechanisms in our analysis. Expanding the concerns raised by Baker and Gompers (2003) regarding the distribution of the board size and board independence parameters, we repeat our analysis using a Poisson distribution for board size; tobit regressions for the truncated measures of board independence and ownership; and a logit regression for the dichotomous separation of leadership measure. For each of the governance mechanisms, the switching regressions yield qualitatively identical results with changes only in the magnitudes of the final numbers.

6. Conclusions

We contend that warrants issued at the IPO substitute for less effective corporate governance structures of IPO firms, consistent with the substitution model of LLSV (2000). Using a hand-collected sample of unit IPO firms matched with shares-only IPO firms going

public from 1996 through 2004, we show that unit IPO firms exhibit the characteristics of a less effective governance structure. Compared to shares-only IPO firms, unit IPO firms have boards that are less independent, have outsiders that own a smaller fraction of firm equity, and are more likely to have the CEO as its chair. Unit IPO firms also have external blockholders that own a smaller fraction of firm equity, and these firms enter the IPO with less debt on the books. These two characteristics prevent unit IPO firms from the potential benefits of external monitoring of management by external blockholders, banks, and other creditors. We use two-stage switching regressions to adjust for selection bias.

Inconsistent with our contention, unit IPO firms have smaller boards than do shares-only IPO firms. The IPO board literature shows that smaller, younger, and riskier firms will have smaller boards. Consistent with Schultz (1993) and others, we show that unit IPO firms are smaller, younger, and riskier than are their shares-only counterparts. This result suggests that firm characteristics are a stronger determinant of board size than is the offering method decision.

Sensitivity tests show that the presence of external blockholders subsequent to the IPO is not a robust result of the analyses. The reason for the inconsistent blockholder results could reside in the difficulty in determining the motivations of blockholders. External blockholders can provide shared benefits of control through their monitoring role (Shleifer and Vishny, 1986; Barclay and Holderness, 1989), or blockholders can use their voting power to extract private benefits of control (Barclay and Holderness, 1992). Simply examining the fractions of equity ownership from firm prospectuses will not provide a distinction of blockholder motives for us to address the robustness issues in the blockholder results.

Overall, the study shows that warrants issued by IPO firms substitute for other governance mechanisms. Officer (2006) finds similar results for dividend payouts, where firms

with less effective governance structures are more likely to pay out dividends. These results are consistent with the LLSV (2000) substitution hypothesis. Our study also addresses the shortfall identified by Gillan, Hartzell, and Starks (2006), who identify the interaction among corporate governance mechanisms as an area for further research.

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Table 1: OFFERING DETAILS

Details on the offerings for firms issuing unit IPOs and matching firms issuing shares-only IPOs from 1996 through 2004, matched pairwise by industry, market value, and offer date. *Shares offered* represents the number of shares of stock offered by the firm at the IPO, in millions. *Warrants offered* equals the number of individual warrants offered by the firm multiplied by the number of shares for which each warrant is exercisable, in millions. *Fraction of total equity offered – shares plus warrants* equals the *Shares offered* plus the *Warrants offered* divided by the number of shares outstanding immediately prior to the offering. *Fraction of total equity offered – shares alone* equals the *Shares offered* divided by the number of shares outstanding immediately prior to the offering. *Fraction of warrant equity offered* equals the *Warrants offered* divided by the sum of the *Shares offered* and the number of shares outstanding immediately prior to the offering. *Offer price* represents the per share price at the IPO, in dollars. *Exercise price* represents the exercise price per warrant, in dollars. *Moneyiness* equals the *Exercise price* divided by the *Offer price*. *Proceeds* includes the amount obtained at the IPO from all markets, in \$millions. *Fraction of proceeds from warrant exercise* represents the amount of funds received by the issuing firm if the warrants are exercised at the initial exercise price. *Underwriter reputation* represents the Carter-Manaster reputation rating for the lead underwriter of the IPO; the higher the number, the more reputable the underwriter. *Warrant life* is the number of years between the offer date and the exercise date. *Day one return* is the fractional return of the first day of trading of the firm's stock. The far right columns provide the results of difference-in-means tests (*t* statistic) and difference-in-medians tests (Wilcoxon *z* statistic) when comparing the unit IPO firms with their matched shares-only IPO firms.

	Unit IPO firms		Shares-only IPO firms		Difference tests	
	Mean	Median	Mean	Median	<i>t</i>	<i>z</i>
Shares offered	1.60	1.28	2.46	2.00	4.23	5.36
Warrants offered	1.93	1.36	-	-	-	-
Total equity offered	3.54	2.80	2.46	2.00	3.57	5.34
Fraction of total equity offered (shares plus warrants)	3.05	1.10	1.28	0.52	2.28	8.48
Fraction of total equity offered (shares alone)	1.39	0.54	1.28	0.52	0.81	1.34
Fraction of warrant equity offered	0.49	0.35	-	-	-	-
Offer price	5.91	5.75	8.88	8.00	7.95	7.17
Exercise price	7.52	6.55	-	-	-	-
Moneyiness	1.28	1.20	-	-	-	-
Proceeds	9.47	7.25	22.66	16.00	6.46	6.11
Fraction of proceeds from warrant exercise	0.55	0.55	-	-	-	-
Underwriter reputation	2.75	3.10	5.62	6.10	11.97	9.03
Warrant life	4.46	5.00	-	-	-	-
Day one return (a)	0.038	0.000	0.002	0.000	1.57	0.27

(a) Stock return data for day 1 were unavailable for 17 firms in the sample. N for the unit IPO set is 132 firms. N for the shares-only IPO set is 139 firms.

Table 2: FIRM CHARACTERISTICS

Descriptive statistics for firms issuing unit IPOs and matching firms issuing shares-only IPOs from 1996 through 2004, matched pairwise by industry, market value, and offer date. *Market value* equals the total number of shares outstanding following the offer times the offer price, in \$millions. *Total assets* represents the value of total assets, in \$millions. *Std dev of returns* is the standard deviation of stock returns based on the first 20 trading days of the firm's stock, excluding day one, subsequent to the offering. *Zscore* is the measure of financial distress used by Mutchler (1985). *Firm age* is the number of years between incorporation of the firm and the offering. *Asset tangibility* equals the value of property, plant, and equipment divided by total assets for the IPO year. *Carve-out / Spin-off* =1 if the firm is an equity derivative of a parent firm and =0 if not. *Market-to-book ratio* equals the market value of equity divided by the book value of assets. *R&D intensity* equals the amount of R&D spending divided by total assets for the IPO year. *Cash flow to sales ratio* equals the operating cash flows divided by the revenues for the IPO year. The far right columns provide the results of difference-in-means tests (*t* statistic) and difference-in-medians tests (Wilcoxon *z* statistic) when comparing the unit IPO firms with their matched shares-only IPO firms.

	Unit IPO firms		Shares-only IPO firms		Difference tests	
	Mean	Median	Mean	Median	<i>t</i>	<i>z</i>
Market value	35.99	19.40	53.33	22.10	0.92	2.11
Total assets	16.35	7.03	56.09	30.21	5.32	9.13
Std dev of returns (a)	0.063	0.048	0.042	0.036	3.66	4.70
Zscore (b)	-0.57	-0.28	3.11	1.47	4.10	7.05
Firm age	14.36	7.75	17.22	11.08	1.14	2.41
Asset tangibility	0.162	0.090	0.229	0.111	2.53	2.28
Carve-out / Spin-off	0.049	0.000	0.118	0.000	2.14	2.13
Market-to-book ratio	6.817	2.500	1.501	0.880	3.05	8.59
R&D intensity	0.149	0.000	0.068	0.000	1.35	0.29
Cash flow to sales ratio (b)	-7.29	-0.44	-1.44	-0.03	2.27	5.68

(a) Stock return data were unavailable for 25 firms in the sample. *N* for the unit IPO set is 125 firms. *N* for the shares-only IPO set is 138 firms.

(b) *Zscore* and *Cash flow to sales ratios* were unavailable for 19 firms in the sample. *N* for the unit IPO set is 141 firms. *N* for the shares-only IPO set is 128 firms.

Table 3: GOVERNANCE STATISTICS

Governance-related statistics for firms issuing unit IPOs and matching firms issuing shares-only IPOs from 1996 through 2004, matched pairwise by industry, market value, and offer date. *Board size* represents the number of directors sitting on the board. *# of outsiders* represents the number of directors identified as outside members of the board. *Independence* equals the fraction of outsiders on the board. *Outsider ownership* represents the fraction of equity owned by outside board members subsequent to the IPO. *Separation of leadership* equals 0 if one person holds both the CEO and board chairman positions and equals 1 if two people hold the posts. *Blockholder ownership* describes the total fraction of equity owned by all external blockholders, defined as unaffiliated entities owning at least 5% of the firm. *Total liabilities* represents the value of total liabilities, in \$millions. *Debt/equity ratio* equals the ratio of total debt divided by total assets. The far right columns provide the results of difference-in-means tests (*t* statistic) and difference-in-medians tests (Wilcoxon *z* statistic) when comparing the unit IPO firms with their matched shares-only IPO firms.

	Unit IPO firms		Shares-only IPO firms		Difference tests	
	Mean	Median	Mean	Median	<i>t</i>	<i>z</i>
Board size	5.20	5.00	6.19	6.00	4.00	4.30
# of outsiders	1.98	2.00	3.11	3.00	4.94	4.79
Independence	0.354	0.400	0.475	0.500	4.47	4.24
Outsider ownership	0.035	0.000	0.082	0.016	3.85	3.90
Separation of leadership	0.306	0.000	0.368	0.000	1.12	1.12
Blockholder ownership	0.107	0.057	0.116	0.081	0.53	1.35
Total liabilities	5.87	2.75	23.44	7.22	4.50	5.95
Debt/equity ratio	0.270	0.149	0.682	0.249	4.18	4.70

Table 4: ADDITIONAL GOVERNANCE STATISTICS

Governance-related statistics for firms issuing unit IPOs and matching firms issuing shares-only IPOs from 1996 through 2004, matched pairwise by industry, market value, and offer date. *CEO age* is the age in years of the firm's head executive at the time of the offering. *CEO is founder* equals 1 if the CEO was a founder of the firm and equals 0 if not. *CEO tenure* is the tenure in years of the CEO at the time of the offering. *CEO ownership* represents the fraction of equity owned by the CEO subsequent to the IPO. *Insider ownership* represents the fraction of equity owned by board insiders subsequent to the IPO. *VC backing* equals 1 if the firm has venture capital support and equals 0 if not. The far right columns provide the results of difference-in-means tests (*t* statistic) and difference-in-medians tests (Wilcoxon *z* statistic) when comparing the unit IPO firms with their matched shares-only IPO firms.

	Unit IPO firms		Shares-only IPO firms		Difference tests	
	Mean	Median	Mean	Median	<i>t</i>	<i>z</i>
CEO age	47.9	47.0	47.5	47.0	0.46	0.42
CEO is founder	0.389	0.000	0.410	0.000	0.36	0.36
CEO tenure	3.32	2.17	3.67	2.58	0.80	1.02
CEO ownership	0.215	0.146	0.149	0.094	3.16	3.25
Insider ownership	0.340	0.357	0.291	0.248	1.99	2.34
VC backing	0.097	0.000	0.375	0.000	5.85	5.54

Table 5: PROBIT RESULTS

Maximum likelihood estimations of the probit regression of an indicator variable taking the value one when firms issue units and zero when firms issue shares only on independent variables for unit IPO firms from 1996 through 2004 and their matched shares-only IPO firms. *Size(Proceeds)* is the natural log of proceeds. *Size(Assets)* is the natural log of total assets. *ReturnVar* is the standard deviation of stock returns based on the first 20 trading days of the firm's stock, excluding day one, subsequent to the offering. *Zscore* is the measure of financial distress used by Mutchler (1985). *Firm age* is the natural log of the number of days from firm incorporation to the offering. *Sold* is the fraction of the firm's equity sold at the IPO. *UWlow* represents the Carter-Manaster reputation rating for the lead underwriter of the IPO; the higher the number, the more reputable the underwriter. *t*-statistics are in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% levels.

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<i>Size (Proceeds)</i>	-0.341 ** (-2.563)	-0.387 *** (-2.811)	-0.355 *** (-2.587)			
<i>Size (Assets)</i>				-0.307 *** (-4.314)	-0.335 *** (-4.468)	-0.306 *** (-3.991)
<i>ReturnVar</i>	6.167 ** (2.364)		5.924 ** (2.278)	3.974 (1.520)		3.962 (1.513)
<i>Zscore</i>		-0.005 (-0.346)	-0.003 (-0.200)		0.007 (0.480)	0.007 (0.480)
<i>FirmAge</i>	-0.056 (-0.728)	-0.041 (-0.520)	-0.049 (-0.625)	0.038 (0.469)	0.054 (0.648)	0.041 (0.490)
<i>Sold</i>	0.097 *** (3.429)	0.090 *** (3.180)	0.091 *** (3.146)	0.060 ** (2.010)	0.054 * (1.758)	0.053 * (1.706)
<i>UW low</i>	2.423 *** (5.918)	2.244 *** (5.526)	2.294 *** (5.446)	2.204 *** (5.531)	2.224 *** (5.289)	2.196 *** (5.277)
Intercept	-1.488 ** (-2.307)	-1.015 (-1.628)	-1.273 (-1.625)	-1.864 *** (-3.333)	-1.730 *** (-3.043)	-1.988 *** (-2.748)
Log-likelihood	-130.8	-127.8	-124.5	-123.7	-120.3	-119.0
Cases correctly identified as unit IPOs	137 / 144	124 / 144	122 / 144	129 / 144	113 / 144	113 / 144
Cases correctly identified as shares-only IPOs	85 / 144	88 / 144	92 / 144	96 / 144	99 / 144	97 / 144

Table 6: OLS REGRESSIONS

Estimation of regressions on governance mechanisms for unit IPO firms issuing equity from 1996 through 2004 and their matched shares-only IPO firms. For each offering type, we perform OLS regressions with and without the correction for selection bias. *CEOage* is the age in years of the firm's head executive at the time of the offering. *CEOfounder* equals 1 if the CEO is a founder of the firm and equals 0 if not. *Tangible* equals the value of property, plant, and equipment divided by total assets for the IPO year. *FirmSize* equals the natural log of the number of shares outstanding following the offer times the offer price, in \$millions. *RD* equals the amount of R&D spending divided by total assets for the IPO year. *CEOtenure* is the natural log of the tenure in years of the CEO at the time of the offering. *CEOown* represents the fraction of equity owned by the CEO subsequent to the IPO. *OutsiderOwn* represents the fraction of equity owned by board outsiders subsequent to the IPO. *CFtoSales* equals the operating cash flows divided by the revenues for the IPO year. *VC* equals 1 if the firm has venture capital support and equals 0 if not. *Carveout* equals 1 if the firm is an equity derivative of a parent firm and equals 0 if not. *ReturnVar* is the standard deviation of stock returns based on the first 20 trading days of the firm's stock, excluding day one, subsequent to the offering. *Zscore* is the measure of financial distress used by Mutchler (1985). *GrowthOpps* equals the market value of equity divided by the book value of assets. *FirmAge* is the natural log of the number of days between incorporation of the firm and the offering. *InsiderOwn* represents the fraction of equity owned by board insiders subsequent to the IPO. Consistent, heteroscedastic-corrected *t*-statistics are in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% levels.

Panel A: BOARD SIZE

Variable	Units		Shares only	
	Bias corrected	Uncorrected	Bias corrected	Uncorrected
Intercept	4.230 *** (4.917)	4.559 *** (5.026)	5.408 *** (4.071)	2.671 ** (2.352)
<i>CEOage</i>	0.003 (0.254)	0.002 (0.123)	0.049 ** (2.273)	0.058 *** (2.763)
<i>CEOfounder</i>	-0.348 *** (-1.018)	-0.383 (-1.132)	0.049 (0.152)	0.189 (0.566)
<i>Tangible</i>	-0.459 (-0.514)	-0.525 (-0.758)	-1.105 * (-1.699)	-0.823 (-1.039)
<i>FirmSize</i>	0.142 (0.647)	0.260 (1.220)	-0.069 (-0.401)	0.269 (1.468)
<i>RD</i>	0.067 (0.949)	0.082 (0.987)	-1.963 * (-1.940)	0.121 (0.101)
<i>Mills ratio</i>	-1.119 *** (-2.715)		-1.864 *** (-5.202)	
Adjusted R ²	0.01	0.00	0.20	0.05

Table 6: OLS REGRESSIONS continued

<i>Panel B: BOARD INDEPENDENCE</i>				
Variable	Units		Shares only	
	<u>Bias corrected</u>	<u>Uncorrected</u>	<u>Bias corrected</u>	<u>Uncorrected</u>
Intercept	0.242 *** (3.330)	0.243 *** (3.418)	0.323 *** (4.106)	0.390 *** (6.284)
<i>CEOtenure</i>	0.006 * (1.731)	0.006 * (1.777)	0.003 (0.433)	0.001 (0.192)
<i>CEOown</i>	0.002 (0.021)	-0.001 (-0.010)	-0.158 (-1.189)	-0.112 (-0.838)
<i>OutsiderOwn</i>	0.967 *** (3.645)	0.924 *** (4.036)	0.757 *** (3.735)	0.703 *** (3.642)
<i>Tangible</i>	-0.029 (-0.317)	-0.027 (-0.296)	-0.136 (-1.506)	-0.143 (-1.521)
<i>FirmSize</i>	0.021 (0.992)	0.019 (0.934)	0.027 (1.384)	0.020 (1.055)
<i>CFtoSales</i>	-0.001 *** (-3.483)	-0.001 *** (-3.489)	0.001 (0.449)	0.001 (0.678)
<i>VC</i>	0.063 (1.208)	0.065 (1.284)	0.054 (1.237)	0.046 (1.068)
<i>Carveout</i>	-0.144 (-1.312)	-0.143 (-1.417)	-0.054 (-1.032)	-0.059 (-1.184)
<i>Mills ratio</i>	0.010 (0.196)		0.064 (1.565)	
Adjusted R ²	0.12	0.13	0.23	0.22

Table 6: OLS REGRESSIONS continued

<i>Panel C: OUTSIDER EQUITY OWNERSHIP</i>				
Variable	Units		Shares only	
	Bias corrected	Uncorrected	Bias corrected	Uncorrected
Intercept	-0.003 (-0.100)	0.006 (0.245)	0.065 * (1.727)	0.002 (0.060)
<i>ReturnVar</i>	-0.118 (-0.953)	-0.154 (-1.246)	0.708 (1.395)	0.749 (1.362)
<i>Zscore</i>	-0.000 (-0.350)	0.000 (0.072)	0.000 (0.299)	0.002 * (1.817)
<i>GrowthOpps</i>	-0.001 ** (-2.222)	-0.001 ** (-2.212)	0.002 (0.402)	-0.005 (-0.774)
<i>FirmAge</i>	0.019 ** (2.073)	0.020 ** (2.152)	0.020 *** (3.082)	0.025 *** (3.698)
<i>InsiderOwn</i>	-0.143 *** (-2.694)	-0.145 *** (-2.732)	-0.227 *** (-6.210)	-0.241 *** (-5.624)
<i>Mills ratio</i>	-0.018 * (-1.754)		-0.088 *** (-4.696)	
Adjusted R ²	0.14	0.14	0.37	0.26
<i>Panel D: SEPARATION OF LEADERSHIP</i>				
Variable	Units		Shares only	
	Bias corrected	Uncorrected	Bias corrected	Uncorrected
Intercept	0.339 *** (3.292)	0.401 *** (4.840)	0.549 *** (5.544)	0.380 *** (4.578)
<i>InsiderOwn</i>	-0.368 ** (-1.977)	-0.365 ** (-1.990)	0.248 (1.382)	0.265 (1.371)
<i>VC</i>	0.160 (1.091)	0.191 (1.313)	-0.011 (-0.130)	0.066 (0.791)
<i>CEOfounder</i>	0.033 (0.411)	0.026 (0.324)	-0.293 *** (-4.034)	-0.278 *** (-3.576)
<i>Mills ratio</i>	-0.129 (-1.038)		-0.251 *** (-3.212)	
Adjusted R ²	0.02	0.02	0.12	0.06

Table 6: OLS REGRESSIONS continued

Panel E: BLOCKHOLDER PRESENCE

Variable	Units		Shares only	
	Bias corrected	Uncorrected	Bias corrected	Uncorrected
Intercept	0.157 *** (2.862)	0.178 *** (3.244)	0.268 *** (4.757)	0.251 *** (4.055)
<i>InsiderOwn</i>	-0.420 *** (-5.355)	-0.420 *** (-5.352)	-0.290 *** (-5.628)	-0.294 *** (-5.792)
<i>ReturnVar</i>	0.043 (0.410)	-0.056 (-0.561)	-0.673 (-1.551)	-0.662 (-1.548)
<i>Zscore</i>	-0.002 * (-1.717)	-0.001 (-1.382)	0.001 (0.410)	0.001 (0.722)
<i>GrowthOpps</i>	0.001 (1.157)	0.001 (1.140)	0.011 * (1.925)	0.009 (1.574)
<i>FirmAge</i>	0.014 (1.472)	0.017 * (1.760)	-0.010 (-1.072)	-0.008 (-0.881)
<i>Mills ratio</i>	-0.049 ** (-2.007)		-0.023 (-1.031)	
Adjusted R ²	0.27	0.26	0.21	0.21

Panel F: DEBTHOLDER PRESENCE

Variable	Units		Shares only	
	Bias corrected	Uncorrected	Bias corrected	Uncorrected
Intercept	0.281 (1.251)	0.283 (1.234)	1.465 *** (3.094)	1.279 *** (2.730)
<i>InsiderOwn</i>	-0.187 (-0.749)	-0.184 (-0.738)	-0.800 (-1.591)	-0.791 (-1.520)
<i>ReturnVar</i>	-1.281 * (-1.899)	-1.301 ** (-2.042)	-9.294 * (-1.842)	-10.404 ** (-2.110)
<i>Zscore</i>	0.008 (0.827)	0.008 (0.811)	0.014 (0.728)	0.021 (1.154)
<i>RD</i>	-0.009 (-0.358)	-0.008 (-0.346)	-1.170 ** (-2.124)	-0.805 * (-1.695)
<i>FirmAge</i>	0.036 (1.001)	0.037 (1.078)	0.008 (0.104)	0.020 (0.276)
<i>CFtoSales</i>	0.001 (1.024)	0.001 (0.928)	0.020 ** (2.033)	0.018 * (1.879)
<i>Mills ratio</i>	-0.010 (-0.123)		-0.240 (-1.270)	
Adjusted R ²	0.00	0.00	0.11	0.11

Table 7: SWITCHING RESULTS

Comparison of average expected values of governance mechanisms if the firms used the actual offering type vs. the alternative. The rows labeled *If firms issued warrants* represents the average expected value of the governance mechanism when assuming that all firms issued units at the IPO, using the vector of estimated coefficients from Eq. (3) for the unit IPO sample. The rows labeled *If firms issued shares only* represents the average expected value of the governance mechanism when assuming that all firms issued shares only at the IPO, using the vector of estimated coefficients of Eq. (2) for the shares-only IPO sample. The coefficient vectors determined for the two-stage and the OLS regressions are applied to Eq. (2) and Eq. (3), dropping the Mills ratio terms, using the data for all firms and for each set of firms.

	Two-Stage Estimates			OLS Estimates		
	All firms	Unit IPO firms	Shares-only IPO firms	All firms	Unit IPO firms	Shares-only IPO firms
<i>BOARD SIZE</i>						
If firms issued warrants	4.61	4.61	4.60	5.20	5.20	5.20
If firms issued shares only	7.13	7.10	7.15	6.21	6.23	6.19
<i>BOARD INDEPENDENCE</i>						
If firms issued warrants	0.386	0.360	0.412	0.379	0.354	0.404
If firms issued shares only	0.413	0.384	0.442	0.451	0.426	0.475
<i>OUTSIDER EQUITY OWNERSHIP</i>						
If firms issued warrants	0.033	0.025	0.040	0.043	0.035	0.051
If firms issued shares only	0.131	0.133	0.129	0.070	0.055	0.084
<i>SEPARATION OF LEADERSHIP</i>						
If firms issued warrants	0.273	0.242	0.305	0.341	0.306	0.377
If firms issued shares only	0.508	0.518	0.497	0.368	0.368	0.368
<i>BLOCKHOLDER PRESENCE</i>						
If firms issued warrants	0.092	0.086	0.098	0.121	0.113	0.129
If firms issued shares only	0.133	0.139	0.127	0.117	0.119	0.115
<i>DEBTHOLDER PRESENCE</i>						
If firms issued warrants	0.330	0.289	0.367	0.336	0.295	0.374
If firms issued shares only	0.583	0.324	0.818	0.458	0.197	0.694

Executive Summary

Firms use corporate governance mechanisms to reduce the agency conflicts between owners and managers of the firm. Managers must weigh the costs and benefits of the available governance mechanisms with the objective of obtaining the most efficient governance structure for the firm. These costs and benefits are firm dependent, thus the most efficient corporate governance structure will vary by firm (Gillan, Hartzell, and Starks, 2006). Managerial decisions regarding corporate governance are quite significant in the early life cycle of the firm. For IPO firms, managers influence such governance decisions as board structure, equity ownership, and capital structure.

Another decision for IPO managers is the method of equity issuance. Schultz (1993) contends that IPO firms issue warrants to reduce the agency conflicts that arise with the proceeds received by the firm. If warrants mitigate agency costs, then the issuance of warrants acts as a corporate governance mechanism. The decision to issue warrants thus arises from a cost/benefit analysis that managers perform when seeking an efficient governance structure. The open question is whether warrants substitute for or complement other corporate governance mechanisms. We conjecture that warrants issued as part of an IPO substitute for other governance mechanisms, consistent with the findings of Officer (2006) who finds that firms with weaker corporate governance structures disgorge more cash, i.e., dividend payouts substitute for other governance mechanisms of the firm.

We develop a hand-collected sample of unit IPO firms (those issuing warrants and shares at the IPO) matched with shares-only firms. Adjusting for selection bias by employing a two-stage switching regression method, the evidence shows that unit IPO firms are more likely to have the characteristics of a less effective corporate governance structure. Specifically, we find

the following characteristics of unit IPO firms compare to their shares-only counterparts: 1) a smaller fraction of independent outsiders on the board, 2) board outsiders owning a smaller fraction of the firm's equity, 3) the CEO also holding the board chairman post, 4) external blockholders owning a smaller fraction of the firm's equity, and 5) lower debt/equity ratios. The boards of unit IPO firms have fewer directors, but the characteristics of unit IPO firms suggest that they would have smaller boards. Firms issuing warrants in an IPO are typically smaller, riskier, and younger than similar firms that do not issue warrants. The extant literature shows that smaller, riskier, and younger firms are more likely to have fewer directors on the board.

Our findings are consistent with the argument that warrants offered with shares at the IPO reduce the agency conflicts arising from the free cash flow received as proceeds (Schultz, 1993; Jensen, 1986). These findings also contribute to the discussion by Gillan, Hartzell, and Starks (2006), who argue that research examining the interrelation among corporate governance mechanisms is incomplete.

From a broader perspective, our findings suggest that research on corporate governance must consider governance as consisting of a portfolio of alternative mechanisms which may substitute or complement each other. Our research is also of interest because it shows an interaction between the financing decisions of firms and their corporate governance that has not been documented previously.

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