# Why Do Public Firms Issue Private and Public Equity, Convertibles and Debt?

Armando Gomes Gordon Phillips*

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We examine a comprehensive set of private and public security issuance decisions by publicly traded companies. We study private and public issues of debt, convertibles and common equity securities. The market for public firms issuing private securities is large. Of the over 13,000 issues we examine, more than half are in the private market. We find that asymmetric information and moral hazard problems play a large role in the public versus private market choice and the security type choice. Our findings show that asymmetric information impacts security choice in a particular pattern: Conditional on issuing in the public market we find a pecking order of security issuance holds, firms with higher measures of asymmetric information are less likely to issue equity. We find a reversal of this pecking order in the private market, firms with higher measures of asymmetric information are more likely to issue equity. Second, we find risk and investment opportunities are important in determining which security type a firm issues. Firms with high risk, low profitability and good investment opportunities are more likely to choose equity and convertibles and to issue privately.

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*University of Pennsylvania and University of Maryland and NBER respectively. Gomes can be reached at gomes@wharton.upenn.edu and Phillips can be reached at gphillips@rhsmith.umd.edu. We thank Murillo Campello, Mark Chen, Gerry Hoberg and Craig MaKinlay as well as from seminar participants at Cornell, Penn State, UBC and Wharton for helpful comments. We alone are responsible for the conclusions and analysis in this paper.

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# Why Do Public Firms Issue Public and Private Equity, Convertibles and Debt?

## 1 Introduction

This study is a comprehensive examination of why public firms issue different security types and why they issue these securities in private versus public security markets. We study both private and public issues of debt, convertibles and common equity - a total of 6 different security-market choices. Private security markets are of increasing importance for public firms. Of the over 13,000 issues by public firms we examine, more than half are in the private market, comprising issuances of equity, debt and convertible bonds and preferred stock. Our comprehensive database allows us to assess the factors that impact both security type and market choice.

We explore two major determinants of the market in which firms sell securities and the type of securities firms issue. First, the existence of asymmetric information may induce firms to sell securities to private parties who may more efficiently produce information, mitigating adverse selection problems. Second, firm risk and investment opportunities may influence which security a firm issues to mitigate agency problems.

While previous studies have examined the importance of asymmetric information and agency problems, our study examines these determinants using security issuance decisions of multiple types and in different markets, and uses novel proxies for these determinants. Our study links three different databases, a private equity and convertible database, a private debt database and the SDC new issue database, to Compustat and CRSP to examine issuance decisions. We also link these databases to IBES to use analyst earnings forecast data to construct measures of asymmetric information and use information on the quality of corporate governance from both existing and hand collected sources from firms' charters and bylaws.

Our results on the major determinants of security type and public versus private security issuance are as follows:

*(1.) Asymmetric information:*

Our results show that asymmetric information is a major determinant of the decision to use the private markets. We have several central results on the importance of asymmetric information. First, firms with the higher analyst earnings forecast error and dispersion (our measures of asymmetric information) are more likely to issue private securities and in particular, private equity and private convertibles. Second, our results for the specific type of security issued show that *conditional* upon issuing in the public market,

firms with higher analyst forecast error and dispersion are less likely to issue public equity and are more likely to issue public debt. Third, we find that *conditional* upon issuing in the private market private equity and convertibles are more likely to be issued by firms with high levels of asymmetric information. We call these results the pecking order of *security issuance*.

While we do not examine capital structure directly, our overall results on security issuance do not provide support for Myers and Majluf (1984) traditional pecking order theory of capital structure. Our results for security issuance *conditional* on issuing in the public markets do provide qualitative support for a pecking order of security issuance, with public equity being less likely to be issued by firms with high measures of asymmetric information. However, our study does not support a traditional pecking order overall as we find a reversal of the pecking order for private markets - with private convertibles and equity the most likely to be issued by firms with high measures of asymmetric information. These results are broadly consistent with Fulghieri and Lukin (2001) who argue that incentives for information production by private investors is higher the more information-sensitive the securities being issued are, and predict private equity securities are more likely to be issued when private offerings are attractive.

*(2.) Risk and Investment Opportunities:*

Our second set of findings shows that risk and investment opportunities and the associated potential agency problems between equityholders and debtholders are also important in determining the choice of market and security - debt, convertibles, or equity. Our results show that firms with higher risk and higher measures of investment opportunities are most likely to issue equity and convertibles. These results are consistent with Green (1984) and Brennan and Schwartz (1988) who argue that management of a company with straight debt outstanding will have an incentive to increase the risk of a firm - thus when there is doubt about the future policy of the company, convertibles can reduce investment inefficiencies. We also find that the likelihood of private bank debt and also private convertibles relative to their public counterparts increase with increases in risk and investment opportunities. These findings are consistent with Blackwell and Kidwell (1988) and Diamond (1991), who predict that private debt will be concentrated with a few lenders who will have more incentives to produce costly information and monitor the firm than dispersed public bondholders. Having fewer lenders also makes the debt easier to renegotiate.

Our results for private versus public issuance of debt are largely consistent with previous empirical evidence. For example, the private-public debt choice has been explored by Houston and James (1996), Krishnaswami et al. (1999), and more recently by Denis and Mihov (2002). They largely agree that higher risk and investment opportunities leads the firm to choose private bank debt over public debt. However,

by considering all the security-market choices rather than a more limited choice set allow us to draw some novel implications. In particular, we show empirically that firms shift from public to private debt as risk starts increasing but after a certain level of risk they shift toward private convertibles or equity.

We also examine the impact of other factors including corporate governance. We find that corporate governance, while statistically significant, is economically not important to security issuance decisions. Firms with higher-quality corporate governance are more likely to undertake a private placement than a public offering, however this result is economically not very important. This result is perhaps not surprising given that theory provides conflicting implications for the relation between agency costs of equity and the use of disciplining devices such as debt and private placements to would be monitors.[2]

While the security-market choice is potentially unrelated to the firms' corporate governance characteristics, the market response to the security-market choice should not be ambiguous: the market should react positively to a firm with low-quality corporate governance that decides to self-discipline and negatively otherwise. We thus estimate a new test of whether debt and private placements are indeed perceived by the market as valuable disciplining devices. We find that the market response is significantly more negative when low-quality governance firms issue public equity, the lowest disciplining security-market choice combination, and is significantly more positive when high-quality governance firms issue private debt, the best disciplining security-market choice combination.

Our findings showing the importance of asymmetric information to multiple security issuance decisions are in contrast to many previous studies.[3] Most previous studies examining issuance decisions have used either a subset of these data or identified security issuance through the statement of cash flows from Compustat.[4] Of particular importance, the statement of cash flows from Compustat does not identify whether the equity or debt issuance was in the public or private market. Our findings extend the results of Hertzel and Smith (1993) and Wu (2003) who examine just equity issues and find support for asymmetric information being important for private placements of equity.

We show that identifying where the security is sold, in particular for equity and convertibles, is im-

[2]For example, Grossman and Hart (1982) argue that firms with incentive problems should use debt to mitigate those problems. A similar argument is made by Kahn and Winton (1998) for the use of private placements to stimulate monitoring. However, managers have discretion over issuance decisions and use of those disciplining devices may be plagued by the same conflicts that it is trying to resolve (see Zwiebel (1996)).

[3]Helwege and Liang (1996) report that asymmetric information does not influence the choice between public equity, private debt and public bonds. Hovakimian, Opler and Titman (2001) also examine multiple security issuances and find a limited role for asymmetric information.

[4]Recent studies that have used Compustat data and a firm's statement of cash flows to ascertain if the firm issues debt or equity include Hovakimian, Opler and Titman (2001), Frank and Goyal (2003), Korajczyk and Levy (2003), and Leary and Roberts (2004a), Lemmon and Zender (2002) and Shyam-Sunder and Myers (1999).

portant for the security choice decision. Our results show that the sensitivity of issuing equity versus issuing debt to asymmetric information is fundamentally different in private versus public markets. Fama and French (2002) also recognize that the statement of cash flows does not identify the source of equity capital for the firm. They show that equity is issued in many different markets and that issues of equity to employees and in mergers are much greater than public issues of equity for most firms.[5] They show that firms, including small firms, issue equity frequently and conclude that the traditional Myers' pecking order of capital structure does not hold. They also conclude that "asymmetric information problems are not the sole (or perhaps even an important) determinant of capital structures."

We show that asymmetric information is extremely important in impacting security *issuance* decisions in external markets. These results are not inconsistent with Fama and French who examine capital structure - as firms with different degrees of asymmetric information may still issue the same security but choose to issue in private versus public markets. The econometric models we estimate show the impact of asymmetric information, as well as risk and other firm-specific variables, on the probability a firm uses the private versus public external market for each type of security: debt, convertibles and equity. We find that asymmetric information strongly impacts the decision to issue privately versus publicly for all security types.[6]

The paper proceeds as follows. In the next section, we discuss the theoretical and empirical literature in more detail and present a reduced form model for our empirical analysis. Section 3 describes the data. Section 4 presents the empirical results and discussion. Section 5 concludes.

## 2 Theoretical Background and Framework for Security-Market Choice

A substantial amount of theory has focused on the role of asymmetric information and agency problems as primary determinants of the choice of security and market. In this section we review the main predictions of these models and review the existing empirical evidence. We also formulate a reduced form econometric model that enable us to test the main predictions of the theories. This econometric model will allow us to estimate the implied sensitivity of the firms' choices to proxies for asymmetric information and moral hazard problems.

[5]Fama and French (2002) use changes in the number of shares and the average market price to identify equity issues. This method does not identify private versus public equity issues. Leary and Roberts (2004b) also use the Fama and French method to identifiy equity issues and also find the traditional pecking order theory of capital structure does not hold.

[6]Our results for equity securities are similar to Wu (2003) who examines the choice between public and private equity and also find that firms with higher measures asymmetric information choose to issue equity privately.

*A. Theoretical Background and Prior Empirical Evidence*

*A1. Asymmetric Information*

One large strand of the literature focuses on problems related to adverse selection due to ex-ante information asymmetries between managers and investors. The classic articles are Myers and Majluf (1984) and Myers (1984) who show that asymmetric information result in a pecking order for external finance - with less informationally sensitive securities such as debt being chosen first by firms with asymmetric information. Moreover, this adverse selection problem may result in underinvestment because undervalued firms may refrain to raise finance due to the dilution cost of selling underpriced securities. Several papers that followed study how security design may mitigate or solve the adverse selection problem. In particular, Brennan and Schwartz (1987), Constantinides and Grundy (1989), Brennan and Kraus (1997), and Stein (1992) demonstrate that convertible securities can be used to solve the adverse selection problem.

Private placements to one or few investors (as opposed to a public offering to several investors) is another mechanism that resolves the adverse selection problem. In the context of debt offerings, Boyd and Prescott (1986) and Diamond (1984) argue that intermediaries such as banks have a cost advantage in producing information because a public offering to dispersed investors leads to either duplication of effort or a free-rider problem. In the context of equity offerings, Chemmanur and Fulghieri (1999) and Maksimovic and Pichler (1999) model how asymmetric information affects the choice between going public and private placements. Chemmanur and Fulghieri (1999) show that firms with significant information asymmetry may prefer a private placement than going public, because private investors can produce additional costly information, thereby reducing the informational disadvantage, while such incentives are not present when shares are sold to dispersed investors. The cost of private placements is that public offerings allow for better diversification of risks and more liquidity. Private placements may also give private investors a costly information monopoly or too much bargaining power (Rajan 1992).

The interaction between the security and market choice and asymmetric information is explored in Fulghieri and Lukin (2001). They show that incentives for information production by investors depend on the degree of information sensitivity of the securities being issued. Issuance of more information-sensitive securities provide greater incentives for information production by investors, thus reducing the extent of information asymmetry and conveying a more positive signal to uniformed investors. Fulghieri and Lukin predict a reversal of the pecking order when the costs of producing information are relatively low, with the likelihood of issuing equity relative to debt being positively related to the degree of information asymmetry. However, the classic pecking order still hold when the costs of producing private information are high, in

which case the firm is more likely to make a public offering.

Overall, these theories suggest several testable predictions:

*ASY 1:* Private securities of a given type (debt, equity or convertibles) are more likely to be issued than their public counterparts when the potential for adverse selection problems are more severe.

*ASY 2:* The benefit of private over public markets should be more pronounced when securities are more information-sensitive.

*ASY 3:* Moreover, conditional on a private offering the reverse of the pecking order should hold. Conditional on a public offering we expect the pecking order to hold. That is, the likelihood of issuing securities that are more information-sensitive is increasing or decreasing with the degree of information asymmetry depending on whether the securities are placed privately or publicly, respectively.

The theories also have implications for the stock price market reaction around issues depending on the security-market choice.

*ASY 4:* First, the abnormal return should be negatively (positively) related with the degree of information asymmetry for public (private) offerings.

*ASY 5:* Second, these relations should be stronger the more a security is sensitive to information.

Empirically, early studies that examine stock returns around offerings are consistent with theory predictions. Wruck (1989), Hertzel and Smith (1993), Allen and Phillips (2000), Chaplinsky and Haushalter (2003), and Brophy et. al (2004) find positive stock market returns around private placements of equity and convertibles. These results are in contrast to the negative returns around public offerings of securities found in Asquith and Mullins (1986), Masulis and Korwar (1986), and Mikkelson and Parch (1986). It has not yet been tested whether the predicted relations between information asymmetry and returns in *each* market hold - we will test these relations in section 4.

Hertzel and Smith (1993) and Wu (2003) find support for asymmetric information being important for private placements of equity. Their results support a certification role for outside investors with the discount to private placement as compensation for the certification provided. Empirical work on the

importance of asymmetric information for multiple security choice decisions shows mixed results. Helwege and Liang (1996) report that asymmetric information does not influence the choice between public equity, private debt and public bonds. Hovakimian, Opler and Titman (2001) also examine multiple security issuances and find a limited role for asymmetric information. Shyam-Sunder and Myers (1999), Lemmon and Zender (2002), and Frank and Goyal (2004) do not examine the role of asymmetric information itself but examine the predictions of the Myers' pecking order theory of capital structure. Shyam-Sunder and Myers find support for the pecking order theory on large firms. Examining a larger set of firms, Frank and Goyal find that larger firms exhibit some aspects of the pecking order, while smaller firms who are likely to be subject to problems of asymmetric information do not. Lemmon and Zender find evidence consistent with the pecking order theory of capital structure after including variables that capture firm debt capacity and desire for financial slack given potential distress costs. Chang et al. (2004) find that likelihood of using equity versus debt is increasing on the number of analyst coverage (their proxy for the degree of asymmetric information), consistent with pecking order predictions. These papers however do not examine the choice between public and private offerings given that they use Compustat data to identify security issues.[7] Given theories make opposite predictions for the relationship between security choice and asymmetric information depending on the market in which securities are issued, these mixed findings may be the result of combining public with private offerings for both equity and debt.

Fama and French (2002) also recognize that the statement of cash flows does not identify the sources of equity capital for the firm. They show that equity is issued in many different markets, including for mergers and to employees, and that public seasoned issues of equity are not primary sources of equity capital for many firms.[8] They show that firms, including small firms, issue equity frequently and conclude that asymmetric information problems are not "the sole (or perhaps even an important) determinant of capital structures."[9] Our results are not inconsistent with Fama and French as we show that firms with high asymmetric information still issue equity - but they issue it in the private market.

Our study is different from prior empirical work in that we explicitly identify private security issues in multiple markets and examine how asymmetric information impacts both the choice of market and also

[7]Helwege and Liang (1996) obtain information from the statment of cash flow and other sources but do not identify private placements of equity.

[8]Most of the analysis of Fama and French does not identify private equity and they do not examine other private security issuance decisions. In one table Fama and French do use SDC to identify private placements of equity. Our source for private equity is more comprehensive having 2.5 times as many private equity issues as SDC.

[9]Recent evidence by Leary and Roberts (2004b), using the method of Fama and French to identify equity issues, also rejects the Myers-Majluf pecking order theory of capital structure. They also examine whether time-varying adverse selection is important in the timing of security issuance decisions.

the type of securities. We do not test a theory of capital structure but rather if asymmetric information is important in security issuance decisions. We test hypotheses about the importance of asymmetric information decisions using multinomial and nested logit models developed later in this section.

Related to asymmetric information, we also examine the extent that firms issue securities in markets based on recent market performance or market timing. While the effect of market timing on long-run capital structure is controversial – Baker and Wrugler (2002) find a long-run effect on capital structure, while Leary and Roberts (2004a) and Kayhan and Titman (2004) present new evidence that shows that the market timing effect on capital structure is limited or only exists for a shorter period– the impact of market timing factors on security issuance has been more consistent. Stock market runup prior to equity issuance has been shown to be significantly positive by Asquith and Mullins (1986) and Korajczyk, Lucas and McDonald (1991) show that equity issues are clustered following earnings announcements and follow good stock market performance is documented. Lucas and McDonald (1990) provide a model of time varying asymmetric information that can explain these findings.

We expand the previous literature to look at the effect of market timing across private versus public markets. The hypothesis we investigate is simple. We examine whether firms are more likely to issue publicly after periods in which the overall stock market and also their own stock has done well. We also find evidence of this effect but show that it is economically less important than the direct effect of our asymmetric information variables.

*A2. Risk, Investment Opportunities and Agency Problems between Claimants*

The literature has emphasized two classical types of moral hazard problems between security holders: the asset substitution problem (Jensen and Meckling (1976)) and the debt overhang or underinvestment problem (Myers (1977)). These problems are more severe for firms with volatile cash flows and low profitability (riskier firms) because the chances of entering in financial distress are higher, and agency problems are particularly acute for firms in financial distress. Also, agency problems are stronger for firms with better investment opportunities (often proxied by Tobin's $q$ and research and development expenditures) due to the higher potential cost of passing up valuable investment opportunities and the greater flexibility to undertake excessively risky projects. Similar considerations explain why these problems are likely to be greater for smaller firms.

The simplest solution to these debt holder- equity holder incentive problems is to issue equity rather than debt. However, equity may have other costs, such as adverse selection costs, and debt may have other benefits, such as tax advantages, so firms have incentives to design debt securities and sell debt securities

to investors in ways that minimize potential conflicts of interest.

Green (1984) and Brennan and Schwartz (1988) propose that convertibles can mitigate agency costs of debt. Convertibles provide incentives for managers not to undertake excessive risk because convertible-holders have a call option on firm value, and the value of convertibles are relatively insensitive to shifts in firm risk -so investment decisions are not as distorted as when the firm issue straight debt.

Private placement of debt is another solution to the problem (Blackwell and Kidwell (1988), Diamond (1991)). When debt is sold to a smaller number of private investors they have more incentives to produce costly information and monitor the firm than dispersed public bondholders. Moreover, private debt is advantageous when the firm enters in financial distress because public debt is governed by the Trust Indenture Act of 1939, which makes renegotiation of public debt contracts more difficult than private debt (see Gorton and Winton (2003) for a recent survey of the literature). Both considerations also apply to convertibles. Therefore, private convertibles are less exposed to incentive problems than public convertibles - however we have not seem any references to this possibility in the literature.

The testable implications of these theories are thus the following:

> *AG1:* Equity and convertibles are more likely to be issued by firms that are riskier and have more investment opportunities.
>
> *AG2:* Private placements of debt and convertibles are more likely then public placements of debt and convertibles respectively in riskier and high growth firms.

Prior empirical evidence support most of the predictions above. Mikkelson (1981) find that convertibles are issued by highly-leveraged, high growth firms. The private-public debt choice has been explored by Houston and James (1996), Krishnaswami et al. (1999), Cantillo and Wright (2000), and more recently by Denis and Mihov (2002). These papers generally agree that higher risk and investment opportunities leads firm to choose private bank debt (or private non-bank debt) over public debt.

Allowing for all the security-market choices rather than a more limited choice set enables us to draw some novel implications. In particular, we will show empirically that firms shift from public to private debt as risk starts increasing but after a certain level of risk they shift toward private convertibles and equity.

Agency problems between managers and shareholders can also create significant distortions. Several papers following Grossman and Hart (1982) have used an ex-ante value maximization perspective to solve for the optimal mix of debt and equity. These papers predict that debt should be used to mitigate incentive problems; debt increases efficiency because it prevents empire building managers from financing

unprofitable projects. The threat of takeover or loss of control is an alternative (or substitute) mechanism to the use of debt in curbing managerial distortions. Indeed Jensen and Ruback (1983), and Shleifer and Vishny (1989) argue that agency problems among shareholders and managers are particularly severe when managers can resist hostile takeovers. Therefore, an implication of the literature following Grossman and Hart (1982) is that debt should be used even more as a disciplining device in firms with powerful antitakeover defenses.

Managers, however, have discretion over leverage decisions and the use of debt itself may be plagued by conflicts. Managers may prefer less than the optimal amount of debt due to a desire to reduce firm risk to protect their underdiversified human capital (Fama (1980)) or their dislike of performance pressure associated with large interest payments (Jensen (1986)). Zwiebel (1996) focuses on takeover threats as a driving force for the use of debt, and partially entrenched managers trade-off empire building ambitions with the need to ensure sufficient efficiency to prevent control challenges (see also Novaes and Zingales (1995)). The more antitakeover defenses the firm have the lower can the debt level be that discourage control challenges, so the debt level should be negatively related to antitakeover defenses.

An alternative mechanism to deal with managerial excess is monitoring by large shareholders (Shleifer and Vishny (1989)). A private placement of a block of shares to an investor that naturally becomes a large shareholder is a direct way to improve monitoring and concentrate ownership (see also Kahn and Winton (1998)). Wruck (1989) examines the excess returns to private placements of equity and finds that these are highest when large new blocks are sold as part of the security sale. Hertzel and Smith (1993) and Wu (2003) do not find evidence that private placements are motivated by monitoring. Recently, Barclay, Holderness and Sheehan (2003) examine long-run equity returns following private placements and find evidence consistent with the conclusion that discounts to private equity are compensation to private blockholders for passively allowing management to become more entrenched. Our interpretation of the current theory and evidence is that the predictions for security issuance are mixed depending on whether managers with poor current governance have discretion in choosing securities.

Even though the security-choice is potentially ambiguous, the market response is not, and should be consistent with value maximization. This observation allows us to contribute a new test of whether debt and private placements are indeed valuable disciplining devices, especially for firm with low-quality corporate governance. According to the value maximization view, the market reaction to public equity (the least disciplining security-market choice combination) should be negative for a firm with low-quality corporate governance. On the other extreme, the market reaction to private debt should be positive for a firm with

low-quality corporate governance.

*B. Reduced Form Model of Security-Market Issuance*

We estimate several different models of security-market issuance decisions. These models allow us to assess the relative importance of asymmetric information and agency problems to issuance decisions.

Our reduced-form econometric model assumes that the firm wants to raise $I$ to invest in a project with positive NPV. Let the NPV of a firm when issuing security $j$ be $V_j(x)$ net of direct and indirect issuance costs, where $x$ is a vector of exogenous, observable firm characteristics, and $j = e, c, d, E, C, D$ for private equity, private convertibles, private debt, public equity, public convertibles, and public debt respectively. The firm chooses the securities-market $Y$ such that $Y = \arg\max V_j(x)$. We model the (unobserved) value function as a linear function of observed relevant firm characteristics plus a random noise. We will consider several different specifications for the decision based on assumptions about the random noise or error.

The multinomial logit model is one of the models we estimate. It corresponds to the case in which firms make separate simultaneous choices for each security-market combination. In this model the random errors for each choice are independent and identically distributed with the extreme value distribution. The multinomial logit model, while appealing due to its simplicity, turns out not to be a good model for security issue decisions. This model assumes that choices between any two alternatives are independent of the others–i.e. the independence of irrelevant alternatives (IIA) assumption. The IIA assumption says that if one of the alternatives is removed from the model, the other alternatives will have an identical proportionate increase in their probability of being chosen. It turns out that when we remove private convertibles from the model, private equity disproportionately gains in probability versus the other choices. Likewise when we remove private debt from the choice set, public debt disproportionately gains in probability.

Given the failure of the IIA assumption, we focus on the results from nested logit models.[10] We estimate two different nested logit models. Model 1: The firms pick the security they wish (debt, convertibles, or equity) to sell first and then choose the market, (public or private), in which they sell the security. This model corresponds to a specification of the error terms for the alternatives that allow for correlation between the public and private choice for each security but assumes choices are uncorrelated across securities. Model 2: We change the nesting structure so that firms choose the market they wish to issue first and then choose the type of security. This model corresponds to a specification of the error terms within choices in the same market but assumes choices are uncorrelated across markets. All models are estimated using the

[10]We do present the results of the simultaneous choice multinomial model in the appendix for comparison purposes. Coefficients have similar signs and significance. The magnitudes and economic significance do differ, with the nested logit results having smaller magnitudes and economic signficance.

maximum likelihood method.

Given that these models are not nested within each other, there is no formal test of the appropriateness of one versus the other model. The advantage of estimating both models is that different types of tests can be conducted. More detail on these models and explicit formulas for the probabilities of making each choices are given in the appendix.

Model 1: Nested logit with security (equity, convertibles, debt) chosen first, market (public versus private) second.

The value of each choice is given in the following table:

| | | *Choice 1* | | |
|---|---|---|---|---|
| | | Equity | Convertibles | Debt |
| *Choice 2* | Private | $V_e = a_{priv,e}x + a_E x + \varepsilon_e$ | $V_c = a_{priv,c}x + a_C x + \varepsilon_c$ | $V_d = a_{priv,d}x + \varepsilon_d$ |
| | Public | $V_E = a_E x + \varepsilon_E$ | $V_C = a_C x + \varepsilon_C$ | $V_D = \varepsilon_D$ |

In the above table $a_E x$ and $a_C x$ are the values of choosing equity, E, and convertibles, C, respectively for a given characteristic $x$ (debt is normalized to zero), and $a_{priv,j}x$ is the additional value from the private choice within that security choice for a given characteristic $x$, indexed by $j$=$e,c,d$ for private equity, convertibles and debt respectively relative to their public counterparts.

Model 2: Nested logit with market chosen first, security second. The value of each choice is given by:

| | | *Choice 1* | |
|---|---|---|---|
| | | Private | Public |
| *Choice 2* | Equity | $V_e = b_e x + b_{priv}x + \varepsilon_e$ | $V_E = b_E x + \varepsilon_E$ |
| | Convertibles | $V_c = b_c x + b_{priv}x + \varepsilon_c$ | $V_C = b_C x + \varepsilon_C$ |
| | Debt | $V_d = b_{priv}x + \varepsilon_d$ | $V_D = \varepsilon_D$ |

In the above table $b_j x$ is the additional value from choosing a particular security $j = e, c, E, C$ relative to debt, with $b_{priv}x$ the additional value a firm gets from making a decision to issue in the private markets. Using the coefficients of the nested choice models we can test the following hypotheses related to the specific theories and predictions discussed in the previous sections.

*Sensitivity to asymmetric of information*: Letting $x_k$, represent the degree of asymmetric information facing the firm, and $a^k_{priv,j}$ be the sensitivity of market for security type $j$ with respect to asymmetric information variable $k$, using the coefficients from these models we can test the empirical hypotheses developed in the previous section about the sensitivity of a particular security type to asymmetric information, conditional on issuing in either the public or private market:

**Hypothesis ASY1:** $a^k_{priv,e} > 0$, $a^k_{priv,c} > 0$, $a^k_{priv,d} > 0$. This hypothesis (from empirical prediction *ASY1* developed earlier) says that firms are more likely to issue private securities over public securities, for all security types, when the potential for adverse selection problems is high.

**Hypothesis ASY2:** $a^k_{priv,e} > a^k_{priv,c} > a^k_{priv,d}$. This ordering (from empirical prediction *ASY2* developed earlier) basically states that as the level of info asymmetry increases the firm is more likely to issue private equity over public equity versus private convertible over public convertibles, or private debt over public debt.

Letting $b^k_j$ be the sensitivity of security $j$ with respect to asymmetric information, we can test the pecking order predictions developed earlier.

**Hypothesis ASY3:** $b^k_E < b^k_C < 0$ & $b^k_e > b^k_c > 0$. That is, the pecking order holds in public markets and the reverse of the pecking order holds in private markets. This hypothesis (from empirical prediction *ASY3* developed earlier) is tested using the coefficients of Model 2 where firms choose the market prior to the type of security choice.

*Sensitivity to risk and agency problems:* Letting $b^r_j$ be the sensitivity of the security $j$ to risk and investment opportunities we can test the following hypothesis about the importance of agency costs.

**Hypothesis AG1:** $b^r_E > b^r_C > 0$, for public markets and $b^r_e > b^r_c > 0$, for private markets. If agency cost of debt is important for firms we expect firms with higher risk and investment opportunities will choose equity over convertibles, and convertibles over debt. In other words, from empirical prediction *AG1* earlier, increases in risk increase the relative odds of issuing public equity over public convertibles $\frac{P_E}{P_C}$ (i.e., $\frac{d(\frac{P_E}{P_C})}{dx_k} = e^{(b^r_E - b^r_C)} > 1$ ) and also the relative odds of issuing public convertibles relative to public debt $\frac{P_C}{P_D}$(i.e. $\frac{d(\frac{P_C}{P_D})}{dx_k} = e^{b^r_C} > 1$). Similar increases in the relative odds ratios are predicted for private issuers.

**Hypothesis AG2:** $a^r_{priv,d} > a^r_{priv,c} > 0$. This hypothesis (from empirical prediction *AG2* earlier), says that firms are more likely to issue private debt and convertibles securities over public debt and convertibles securities, and the effect is stronger for debt than convertibles. Similar sensitivity is predicted to hold when firms have more investment opportunities.

We do not explicitly state the hypotheses developed for corporate governance and agency problems as they depend on whether value maximization or managerial discretion are the predominant force in security issuance. Which motive holds will depend on the signs of the coefficients on the corporate governance variables estimated in Model 1 above.

# 3 Data

*A. Data*

We study security issuance by public U.S. corporations from January 1995 to December 2003. The data on securities issuance comes from three different databases: PlacementTracker Database of Sagient Research Systems, SDC new issues database, and DealScan database of the Loan Pricing Corporation. We match the data obtained from these sources to Compustat and CRSP, to obtain information on firm financials and stock prices. Following standard practice in the literature, we excluded from our sample financial firms (SICs 6000-6999) and regulated utilities (SICs 4900-4999). Our final sample matched to CRSP and COMPUSTAT has 13,282 issues during the 1995-2003 period. The total amount raised was over $2.9 trillion and the mean (median) amount raised by each deal is also sizable representing 23% (13%) of the total firm value (see table 1). There are a total of 4,137 different firms in our final sample, and the median firm financed 2 times during the period (most of the multiple issues are multiple debt offerings by the same company).

The data source for public offerings of debt, equity and convertibles preferred stock and bonds (henceforth, convertibles) is the Thomson Financial SDC new issues database.[11] The data on privately placed common stock (or private equity deals) and privately placed convertibles are from the PlacementTracker database of Sagient Research Systems. The company specialize in collecting data on private placements of common stock and convertibles primarily from SEC filings such as 10-Ks, 8-Ks, and 13-Ds (coverage started in 1995, hence the beginning of our sample).

A private placement is a private sale of unregistered securities by a public company to a selected group of individuals or institutional investors without general investor solicitation. These sales are typically made to a small number of investors (the median (mean) number of investors in our private equity offerings is 3 (5.4)) and are generally conducted in accordance to the "safe harbor" provisions of Regulation D of the 1933 Securities Act.[12]

Private placements of equity-linked securities are also commonly referred to as Private Investments in Public Equity, or PIPEs, and the PlacementTracker database includes almost all such deals.[13] After

[11] We excluded secondary offerings, in which the company is not issuing new shares, and short-term debt offerings (maturity less than one year).

[12] Regulation D is an SEC Rule that allows public companies to issue stock privately, without the need for public registration prior to the sale, to an unlimited number of accredited investors and no more than 35 non-accredited investors.

[13] We do not include in our sample a few transactions classified as common stock shelf sales and equity line arrangements, because they typically require a registration statement to be effective prior to the sale of the stock, technically making them public offerings.

matching with Compustat and CRSP, and excluding financial companies and regulated firms, we have a total of 1,296 private equity issues and 1,065 private convertible issues made respectively by 762 and 668 different companies.

Our sample of private corporate debt is from the DealScan database of the Loan Pricing Corporation, a Reuters company. The database contains information on term loans and revolving credit lines made to U.S. companies by banks or syndicates of lenders. We include in our sample only long-term commercial loans and revolving credit lines (thus, for example, we drop 364-day facilities and any other loan with less than one year of maturity).[14] Companies often borrow using multiple loans or tranches at the same time. In our dataset, we aggregate all tranches into a single transaction or deal adding up the amount of all long-term loans and revolving credit lines. Our final sample involves 5,568 deals by 2,615 different companies over the 1995-2003 period (mean (median) number of 2.2 (2.0) private debt offerings per company). The most common type of private debt are revolving credit lines (78% of the deals) followed by term loans (18% of the deals)-deal type was determined based on the type of the largest tranche in case of multiple tranches.

We also include in our dataset Rule 144-A convertible and debt issues, which are also private placements of unregistered securities. However, these transactions are distinct for what we classify as private deals because investors are Qualified Institutional Buyers (Q.I.B's)- large institutional investors with over $1billion under management-, and moreover, these transactions are typically made to a significant number of investors. For example, the median (mean) number of investors in 144A-convertible offerings is 33 (41), while in the private convertible offering it is just 2 (3.4). In addition, the company often agrees to register the securities issued a few months after the offering, making these transactions more similar to public offerings than private offerings. Our sample for 144-A convertibles is obtained from the PlacementTracker database (486 deals) and for the 144-A debt offerings is obtained from the SDC new issues database (927 deals)-we exclude all such deals from DealScan to avoid double counting.

We aggregate multiple deals by the same company and of the same type (i.e., one of the 8 security-market choices) that occur within the same month, as we believe that they are likely to be different tranches of the same deal-the procedure serves to combine mostly multiple debt issues. The final sample is a total of 13,282 transactions with data in both Compustat and CRSP.

*B. The Variables*

Our focus is on the relation between the security and market choice and firm characteristics. Specifically, we are interested on the security choice-equity, debt, or convertibles-and the market choice-private versus

[14] We also dropped credit lines whose primary purpose is to back-up commercial paper, as those credit lines are seldom used.

public-a total of 6 choices. Because 144-A and public seem more alike than 144-A and private offerings (see for example the results in table 2B) we aggregate 144-A and public offerings (we also do the analysis excluding 144-A and the results are similar). We also consider a full 8 choice model in which we look separately at the choice of 144-A convertibles and debt.

*B1. Asymmetric Information*

We match our dataset to IBES to use analyst earnings forecasts as a proxy for asymmetric information. The main idea is that the dispersion among analysts forecasts and analyst forecasting errors are two measures that are positively correlated with the difficulty investors and analysts have in estimating firm value, and thus are likely to be positively correlated with asymmetric information, and insiders' private information.

We use the IBES summary history database, which provides a monthly snapshot of consensus earnings forecasts.[15] In our study we use analysts forecasts for the company's upcoming quarterly earnings release. We construct two proxies: an earnings surprise measure and a dispersion measure.

The *earnings surprise measure* used for each deal is the mean quarterly earnings surprise for the last four quarters with earnings report date preceding the issue date. The quarterly earnings surprise is computed as the absolute value of the difference between the median earnings estimate and the actual earnings per share, normalized by the stock price at the end of fiscal quarter (we also consider the robustness to alternative normalizations based on the book value of equity per share and earnings per share). A similar approach is used to construct the *dispersion measure*: it is the standard deviation of outstanding earnings forecasts normalized by the stock price, averaged over the last four quarters preceding the issue date. This measure is only available if there are at least two outstanding earnings forecasts. The surprise and dispersion measures are trimmed to remove the most extreme 1% observations. This serves to remove outliers and potentially misrecorded data.

Summary statistics are reported in table 2A. Note that the surprise measure is available for 11,225 of the transactions (85% of total) and the dispersion measure for 9,864 (75% of total). The dispersion measure is available for fewer deals as we require at least two earnings forecasts for this measure. Also, note that the test for differences in means reveals that both surprise and dispersion are significantly higher for private than public offerings, consistent with the view that there is more asymmetric information for

[15]The dataset contains summary statistics of earnings forecasts, such as means, medians, standard deviation, and the number of estimates, computed every Thrusday before the third Friday of every month (the statistical period) based on earnings forecasts outstanding. We use the consensus information of the latest statistical period before the quarterly earnings report date to construct our proxies.

companies involved in private deals.

*B2. Risk, Investment Alternatives and other Firm-Specific Variables*

We use several firm specific variables from Compustat and CRSP. Our measure of risk is a firm's *cash flow volatility* calculated as the standard deviation of cash flow (operating income before depreciation, Compustat data number: data13) using up to twenty fiscal quarters prior to the deal date. As control variables, we also include a *financial distress* indicator which is Altman's Z-score equals to one if Z is less than 1.81 (see Altman (2000)). We include the *log of firm value* ( *log firm size*) which is equal to market value of equity plus book values of preferred stock and total debt (Compustat data numbers: data24*data25 + data9 + data34 + data39). Other variables included are *Tobin's q*, which is calculated as the market value of the firm divided by the book value of assets (data6) and a firm's *debt/asset ratio*, calculated as long term debt divided by book value of assets (Compustat data numbers: data9/lagged data6), R&D divided by lagged property plant and equipment, which is defined as the total of R&D plus advertising (Compustat data numbers ((data45+data46)/lagged data8). Profitability is operating cash flow before depreciation divided by lagged assets (data13/lagged data6) All of these variables are computed for the last fiscal year ending before the transaction date. Using CRSP data we calculate a firm's *cumulative abnormal return* 250 days prior to the deal minus the excess return relative to a benchmark portfolio of firms in the same size decile at the end of the year previous to the transaction (we also used a risk-adjusted beta decile portfolios for robustness). For each deal we also compute the abnormal excess return using windows of 1, 5, 10 and 21 trading days around each issue- the parameters of the market model were estimated in the prior 250 trading days ending at the beginning of the event window. For all constructed variables except Tobin's $q$ and assets we eliminate outliers by dropping the top and bottom one-percent of the sample. We also eliminate firms, after eliminating other outliers, whose lagged book value of assets are less than .1 million dollars and whose Tobin's $q$ is in the 99th percentile or above.

*B3. Corporate Governance*

Our proxy for the degree of agency costs of equity is the quality of corporate governance as reflected by the provisions adopted by firms in their charters and bylaws. We follow the approach used by Daines and Klausner (2001) to build a corporate governance measure. They focus on four key antitakeover provisions on the charter and bylaws that erect significant barriers to a hostile acquisition: (1) dual-class shares; (2) a classified (or staggered) board; (3) prohibition of shareholders voting by written consent; and (4) prohibition of shareholders calling a special shareholder meeting. Daines and Klausner (2001) argue that (2) and (3) are almost perfect substitutes so there is a shareholder voting restriction if and only if (3) and

(4) are both in place.

We construct a rank level ordering measuring the *quality of corporate governance* following Daines and Klausner (2001, pg.116): 1 (worst), if the firm has dual-class shares or has a classified board and a shareholder voting restriction; 2, if the firm has a classified board but no shareholder voting restriction or dual-class shares; 3, if there is a shareholder voting restriction but not a classified board or dual class shares; and 4 (best), if the firm has none of the restrictive provisions above.[16]

Our data on corporate governance provisions are from three different sources: the Investor Responsibility Research Center (IRRC) dataset on takeover defenses, SharkRepellent.net web site, and, for a randomly selected sample of 2,000 deals not matched to any of the two datasets, we hand collected the information from the firm's charter and bylaws. The information we use to construct the governance measure is based on the provisions prevailing in the charters and bylaws before the deal date.[17] The use of takeover defenses in our sample is similar to the results reported in Daines and Klausner (2001), Field and Karpoff (2002), and Gompers et al. (2003). The distribution of the corporate governance measure is, in increasing order, 31% (worst), 29%, 6%, and 34% (best), for the 10,502 deals with complete information.

*B4. Market Variables*

We include three market variables in our regressions to capture aggregate market conditions in the public markets. We include the *Aaa bond yield*, a *credit spread* to capture a distress risk premium, measured as the Baa less the Aaa bond yield- we use the value of these variables as of the end of the previous month before the issue date. Finally to capture conditions in the public equity markets we include the *cumulative market return* over the 250 days prior to the security issue date.

# 4 Results

*A. The Sample*

Table 1 summarizes our sample of public firms and their issue decisions by year and for the entire period. We present data for eight different security types: public equity, convertibles, and debt, private equity, convertibles and debt, and debt and convertibles issued on Rule 144-A.

**Insert Table 1 here**

[16] Daines and Klausner (2001) also make a further refinement based on whether the charter require a 90 days or more advance notice for the nomination of board candidates. We chose not to use this provision because it is not available in the IRRC dataset (also we believe this provision is not as relevant as the other ones).

[17] IRRC data is available for 1990, 1993, 1995, 1998, 2000, and 2002. SharkRepellent.net does not record historical information, so we used the current information for 2,700 deals matched to SharkRepellent.net. However, since firms seldom change provisions in charters and bylaws, we believe that this procedure is not likely to introduce significant measurement errors.

Table 1 shows several important facts. First, private equity and private convertible issues are a substantial fraction of securities issued by public companies. This fraction has also been increasing over time with the number of private equity issues exceeding public equity issues from the year 2000 to 2003, the last year of our database. Second, the number of private convertibles is greater than the number of public convertibles for all years since 1995. The table shows that while private debt issues are larger than public debt issues, private equity issuers are smaller and issue equity of a smaller fraction of firm value. Third, the size of private equity issues and the size of issuers. has also grown sharply in the later years. In later years the size of private equity issues on average is almost 25% of the size of an average public equity issue. Finally, Table 1 shows that Rule 144-A debt and convertible issues are closer in size to public debt and convertible issues.

Table 2A summarizes the firm- and market-specific variables that we examine. We present summary statistics in this table for the whole sample and also for each of the eight security categories. We present means, standard deviations and the number of observations for each variable. Table 2B presents t-statistics testing whether the means from Table 2A are different across issue types.

**Insert Table 2A and Table 2B here**

Tables 2A and 2B show several interesting and significant patterns across the variables. First, columns one and two show our measure of asymmetric information, analyst earnings surprise and dispersion, are both significantly higher (t-statistics for differences in means are presented in Table 2B) for securities issued in the private market. Measures of corporate governance are also higher in the private equity, convertibles and debt markets. Tables 2A and 2B also show that private firms are smaller, have higher cash flow volatility (our measure of risk), higher R&D ratios and higher Tobin's $q$s. Firms that issue in the private market, however, have lower profitability and higher measure of financial distress despite having less debt. While private convertible issuers are sharply different from public issuers, issuers of convertibles in the 144-A market are not significantly different from public issuers. They are also closer to public debt issuers than they are to private debt issuers.

The picture that emerges from these summary statistics is that public issuers in the private market are smaller, highly valued, less profitable firms versus public issuers that have a higher measures of our proxies for asymmetric information. This conclusion is true for public firms irrespective of the security type. Issuers in the public equity and convertible markets issue after a period of high cumulative abnormal returns - reinforcing the conclusions of Lucas and McDonald (1990). Especially interestingly given past

findings of an opposite relation, when we separate out issues by the private and public markets, issuers of debt are more profitable - especially when compared to issuers of private equity and private convertibles who have significantly negative operating cash flows.

*B. Stock Market Response*

We now present the stock market reactions to each type of security issuance decision. Table 3A presents the cumulative abnormal returns from a market model over different event windows relative to the announcement date for the security issuance. In each case the excess returns are calculated from parameters of a market model using 250 days of data prior to the first day in the event window.

**Insert Table 3A here**

Inspection of Table 3A reveals results consistent with previous event studies. The market reaction to public convertibles and public equity is negative while the market reaction to private equity is strongly and significantly positive, consistent with Wruck (1989), Hertzel and Smith(1993), and Allen and Phillips (2000). For private convertibles and private debt, we also find a significant positive market reaction, albeit one that is lower than that of private equity.

Table 3B presents the results from cross-sectional regressions of the cumulative abnormal returns on issue type and issuer characteristics. We regress the 21 trading-day CAR around the issue on public versus private market type, and firm and market characteristics. We run regressions for equity, convertibles and debt separately to examine the differences across markets, conditional on security type. We interact the earnings surprise and corporate governance variables with market type (public and private) indicator variables to examine whether there is a different market response to these variables by security type. Other variables are included as control variables.

**Insert Table 3B here**

Inspection of Table 3B reveals that the overall reaction to private equity is positive while the reaction to public equity issues is negative. These results are evident in the coefficients on market choice indicators in column 1. In columns 1 and 3, the significant positive interaction variable between earnings surprise and private issues in the equity and debt markets is consistent with the market valuing the new information conveyed by private investors purchases of securities. The result that the markets reaction to public equity issues is more negative as earnings surprise increases is consistent with the stock market penalizing public issuers with high asymmetric information. This result is consist with prediction *ASY4* and *ASY5* presented in section 2.

Inspection of the results in Table 3B also shows that the market response is significantly more negative when low quality governance firms issue public equity, the lowest disciplining security-market choice combination, and is significantly more positive when high-quality governance firms issue private debt, the best disciplining security-market choice combination. The market thus reacts positively to firms with bad governance that decide to self-discipline and negatively otherwise. This result is consist with predictions presented in section 2. Finally, the results also show that firms that issue equity and convertible securities after a large runup in the stock price suffer a negative reaction, consistent with the market believing that equity issuers are taking advantage of asymmetric information.

*C. Nested Logistic Regressions*

In this section we present and discuss our models of security issuance. We estimate the two models presented in section 2. First, we estimate the model where firms choose the security first they will issue (debt, convertibles or equity) and then choose whether or not to issue it in the private versus public markets (Model 1). Second, we estimate the model where firms choose the market first in which they will issue (private versus public markets) and then choose the security type (debt, convertibles or equity) (Model 2). We also estimate and present an eight choice model where we include as a choice of market securities issued under Rule 144-A.

Before moving to a nested logit model, we estimated a simple multinomial model where firms simultaneously choose both the security and market. In order for this model to present valid coefficient estimates, the choices must satisfy the independence of irrelevant alternatives (IIA). This assumption holds if when you omit one security category, the other security probabilities increase proportionately. We conducted several different Hausman tests to examine whether this assumption held and found that it did not. We found that the choices of public versus private in particular were not independent of each other. The nested logit is an alternative that does not require this assumption between choices across choices that are not in the same group. For comparison we still do present the results from the multinomial model in the appendix (Tables A1 and A2) of this paper. Examining the coefficients of the multinomial model and comparing them to the nested logit models (in Tables 4 and 5), we can see that while there are differences in magnitude between the multinomial and the nested logit models, the good news is that the signs and significance across the multinomial and nested logit models for our key asymmetric and risk variables are of similar sign and significance.

Table 4 presents the results of nested logit where firms choose the security first and then choose the market in which they sell the securities. While there is not a test that tells us whether this model or the

model in which firms choose the market first are correct, a test of whether the additional assumption of independence (testing if the inclusive parameters are significantly different from one) was strongly rejected for this model, given us additional evidence that the multinomial model is not appropriate versus this model.

**Insert Table 4 here**

The results presented in Table 4 show that in the first stage when firms choose securities, firms with a high degree of asymmetric information are less likely to choose equity over debt. Second, they are more likely to choose equity and convertibles if they have high risk and investment opportunities. With respect to other firm characteristics, firms are more likely to choose equity and convertibles if they are small and have low operating cash flows. These proxies have also been used to capture firm risk and investment opportunities by other studies. Similar to the results by Lucas and McDonald (1990), the positive significant coefficient on a firm's past year CAR shows that firms are more likely to issue equity when the firm's stock has risen recently. The overall results are consistent with high risk and thus agency problems of debt causing firms to be more likely to issue equity. The positive coefficients for the Aaa bond rate and the credit spread, Baa-Aaa, are consistent with the firm choosing to issue equity the more costly debt becomes and the higher the default risk spread.

Examining, the choice between public and private in the second stage, we see that higher degrees of asymmetric information are also positively related to the decision to issue private securities - especially so for equity. This result is consistent with hypothesis *ASY1*. The ordering of the coefficients also statistically satisfies Hypothesis *ASY2* which states that as the level of info asymmetry increases the firm is more likely to issue private equity over public equity, and also with a larger difference than the ranking of private convertible over public convertibles and private debt over public debt. The coefficient on asymmetric information for private equity is 1.45 which is statistically greater than .488, the coefficient on asymmetric information for private convertibles, which in turn is statistically greater than coefficient for private bank debt of .214.

The results for the second stage also show that high risk increases the tendency toward private debt relative to public debt. However, the results show only limited support to hypothesis *AG2*. Examining the effect of corporate governance, perhaps surprisingly, if one viewed the private market as providing increased monitoring, better governance is associated with an increased tendency to issue private equity over public equity, and also holds for private debt over public debt. For debt the corporate governance

variable is insignificant.

Looking at the other control variables we can see that smaller firms, firms with higher Tobin's q and lower profitability are more likely to issue privately for all security types, and firms in distress also more likely to issue private equity and convertibles relative to their public counterparts. Finally firms that have had lower CARs over the past year are more likely to issue privately. Thus the picture that emerges is that small, highly valued firms whose stock market performance recently has not been good and whose cash flows are low are more likely to choose to issue privately.

In the appendix in Table A3 we estimate the same model with analyst forecast dispersion as the measure of asymmetric information. Inspection of the table shows that the results are generally similar for nearly all coefficients. One exception is the coefficient on asymmetric information for the choice of private debt becomes insignificant. However, all other asymmetric information coefficients remain similar in size and significance. This table also shows that firms in distress are less likely to issue private debt - results consistent the conclusion that private lenders and banks do not like to lend to firms already in distress.

The overall conclusions that emerge from Table 4 are consistent with the summary statistics presented earlier. There are sharp differences between public and private issuers in all markets - and an especially sharp distinction between issuers of public and private equity. Firms with a high degree of asymmetric information are more likely to issue privately and issue private equity. Risk and investment opportunities affect more the security choice with high risk firms issuing equity and convertibles. Risk has a positive effect on the tendency to issue private debt over public debt but no significant effect for equity and convertibles.

Table 5a examines the economic significance of our results and Table 5b shows how well the model predicts the actual observed choice. To compute the economic effects we use the estimated model and associated coefficients from our results in Table 4. We examine the economic significance in two different ways. We first present the marginal significance of our primary nested logistic specifications and then we graphically show the significance of our results. Table 5A presents the marginal significance of our results we compute the predicted probability at the firm level and then, holding all other variables, at their individual sample values vary each specific variable +/- one-half standard deviation. We then average over all firms in the sample. The effect depends on where in the logistic distribution each choice variable is located as our later graphs will show. If a given probability is either very high or very low, or in the tails of the logistic distribution, variations in the right-hand side variables may not have as large of an effect as is actually present. We explore this issue further in subsequent graphs.

**Insert Table 5a here**

Table 5a shows there is significant variation in the predicted probability of security issuance as we vary each variable. Table 5a shows that if we increase our measure of asymmetric information, analyst forecast errors by one-half standard deviation, the predicted probability of public equity decreases by 6.4 percentage points and the predicted probability of private debt, private convertibles and private equity go up by 9.1 percentage points and a total variation across the six choices of 18.1 percentage points. Security choice is also highly sensitive to risk and investment variables such as R&D to Net Fixed Assets, Profitability also have a large effect with total variation in the predicted probabilities of a total of about 15 percentage points. The table also shows that corporate governance and the market timing variables are not as economically important as asymmetric information.

Table 5b shows how well the nested logit from Table 4 does in predicting the actual observed choice. The table contains the observed choice in the rows and the predicted choice in each column. The predicted choice is the maximum probability among the six choices in Table 4. The first row is the actual predicted count of those who actually choose the security in the row. The second row is the percentage the predicted is of the actual number of issues of that security. The third row is the percentage of the predicted for that security (of those issuing a particular security) of the total predicted for that security overall.

**Insert Table 5b here**

Table 5b shows that Table 4 does overall very well in predicting security issues for most securities. The model does very well in predicting public debt (62 percent predicted correctly), private debt (77 percent predicted correctly) and private equity (54 percent predicted correctly). Perhaps not surprisingly the model does less well in predicting convertible securities as they are a blend of equity and debt. Interestingly, the model predicts many public equity issues as private debt, perhaps because private debt gives firms flexibility like public equity.

Table 6 presents the results of our nested logit model 2, where firms choose the public versus private market first and then choose the security second. Under this model we can also test the hypotheses tests on the pecking order conditional on market choice. Table 6 uses analyst forecast errors as our measure of asymmetric information. In the appendix in Table A4, we present results using analyst forecast dispersion. As before this table omits firms that have less than 2 analysts so the sample is smaller.[18]

[18]The results using analyst forecast dispersion as the measure of asymmetric information are generally similar to those of Table 6 for nearly all coefficients. One exception is the coefficient is insignificant on forecast dispersion for issuing privately in the first stage. However, all other coefficients on analyst forecast dispersion for the second stage security decisions remain similar in size and significance to those for analyst forecast error in Table 6. Notably the coefficient on asymmetric information for public equity remains significantly negative and the coefficient on private equity remains significantly positive.

**Insert Table 6 here**

The results presented in Table 6 show that in the first stage firms with a high degree of asymmetric information and high cash flow volatility are more likely to sell securities in the private market. Examining the results yields similar conclusions to those from in Table 4. Small firms, with high Tobin's q, with worse recent CARs and low profitability are more likely to choose to issue securities privately. The results for R&D show that high R&D increases the tendency for firms to issue privately.

Columns 2 through 5 report the results conditional upon the market. We see that conditional on issuing in the public market, public issuers are more likely to issue public debt relative to public convertibles and public equity when asymmetric information increases. We test Hypothesis *ASY3* formally and find that the coefficient for public equity is significantly lower than both public convertibles and public debt. Thus, the results for public equity are consistent with the Myers's pecking order in the public market. However the coefficient on public convertibles is not significantly different from zero and thus public convertibles do not satisfy the pecking order.

We also find that conditional on issuing in the private market the opposite of the pecking order holds consistent with Fulghieri and Lukin (2001) (Hypothesis *ASY3* predicting a *reversal* of the pecking order for the private market). Distress is the another variable that shows a different pattern for public and private markets. Firms issuing privately are more likely to issue equity and convertibles if they have high measures of financial distress. There is no significant relation between distress and security issuance in the public markets. The final relation that differs across the public and private markets, is that when the overall market CAR is positive, issuers in the public market have a higher tendency to issue equity, while this effect is reversed in the private markets. Private issuers are more likely to issue private debt versus private equity when the overall public equity market has done well.

With respect to risk and our tests of Hypothesis *AG1* for risk, we find that the ordering of highest sensitivity of risk for equity, next highest for convertibles and lowest for debt does hold in the public market. In the private market both equity and convertibles have a higher sensitivity to risk versus the benchmark of private debt, but the sensitivities of private equity and private convertibles are not statistically different from each other. Thus we find a strict ordering for sensitivity to risk holds in the public market as specified by Hypothesis *AG1*, while a weak ordering holds in the private market. However we find only limited support for Hypothesis *AG2.* Firms are not more likely to issue private securities over public securities when firms are riskier for equity and convertibles. We do find support for private debt being more likely to be issued versus public debt when firms are riskier.

**Insert Table 7 here**

Table 7 presents the economic significance of the results in Table 6 holding all variables except the one in the row at their sample medians. The table shows there is significant variation in the predicted probability of security issuance as we vary each variable. Table 7 shows that if we increase our measure of asymmetric information, analyst forecast dispersion by one-half standard deviation, the predicted probability of public equity decreases by 9.5 percentage points and the predicted probability of private debt, private convertibles and private equity go up by 11.1 percentage points and a total variation across the six choices of 22.6 percentage points. Security choice is also highly sensitive to risk and investment variables such as R&D to Net Fixed Assets, Profitability also have a large effect with total variation in the predicted probabilities of a total of about 15 percentage points. As in Table 5a this table also shows that corporate governance and the market timing variables are not as economically important as asymmetric information.

The overall message that emerges from these tables reinforces the conclusion that the effect of asymmetric information is quite different in the public and private markets and that issuers of public and private securities are quite different. Firms with a high degree of asymmetric information are more likely to issue privately and issue private equity. A striking difference is evident for the public market. Conditional upon issuing in the public markets, firms with a high degree of asymmetric information are more likely to issue public debt over public equity. The results reinforce the conclusion that in order to gauge the effect of information on security issuance decisions, it is crucial that one does not combine private and public security issues.

In order to formally show that the distinction between private and public markets is important, we combine the private and public equity and also the private and public debt and reestimate the previous multi-choice specification using a logit with the decision to issue equity equal to one. We also combine the convertible preferred stocks into the equity category and the convertible bonds into the debt category. These results would be the ones we would get if we used a firm's statement of cash flows to infer security issuance and did not know the market in which the security is sold. Comparison of these results with ones in which we break out the specific market in which a security is sold, allow us double check whether a different sample is driving our results. These results are presented in Table 8.

**Insert Table 8 here**

Examination of the results in Table 8 confirm that the distinction between the public and private markets is very important. If we combine public and private equity and public and private debt, none of

our asymmetric information variables are important. In addition the governance variable is not significant either. The finding of insignificance for the asymmetric information variables is consistent with the results of Helwege and Liang (1996). These results are perhaps not surprising as earlier in our specifications that treat public and private securities separately, we found opposite signs by type of market on these variables. In addition, the results in this table for the risk variable and for R&D, and for many other variables, are of much smaller magnitude

Table 9 presents the final nested logit specification. In this table we expand the number of markets to include debt and convertibles issued in the Rule 144-A market. In Table 6 we present the results for security first followed by the market. We do not present results for the model where issuers choose the market first followed by security type as they were very similar.

**Insert Table 9 here**

The results for equity and convertibles in Table 9 are similar to those in Table 4 and Table 5. Firms with a higher measures of asymmetric information are less likely to issue equity but conditional upon issuing equity are more likely to issue privately. The results for asymmetric information for issuing privately conditional upon issuing debt become insignificant and the results for asymmetric information for securities issued under Rule 144-A are insignificant Our explanation for the weaker results for issuing debt securities is that we are splitting public debt securities into two categories in this table. The results for risk are similar to the previous, with the additional result that firms that issue debt are more likely to issue Rule 144-A versus public debt if they have high risk. Other results for securities issued under Rule 144-A include the result that these are smaller, less profitable, highly valued firms that issue in this market versus issuing in the public debt markets. They are firms with less R&D versus those that issue debt publicly. Overall the results are consistent with the firms issuing debt under Rule 144-A being riskier than firms that issue in the public debt markets but ones which do not have a different degree of asymmetric information.

*D. Graphical Presentation of our Results*

Graphically we show how our predicted results vary *by security* as we vary our two primary variables, asymmetric information and risk, +/- 10 standard deviations, holding all other variables at their mean values for that specific security.

Figure 1 shows the predicted probability of security issuance using coefficient estimates from our model in Table 4A for each the six different security choices. Risk (volatility of cash flows) is on the y-axis and

asymmetric information (earnings surprise relative to analyst forecasts) is on the x-axis. We hold all data at security means and then vary risk and asymmetric information proxies from +/- 10 standard deviations away from the mean value for each security type. PuE (PrE) is public (private) equity, PuC (PrC) is public (private) convertibles, PuD (PrD) is public (private) Debt. Dark/medium/light shading within regions represents predicted probability of that security greater than 50%/30-50%/0-30% higher than the next highest security.

**Insert Figure 1 here**

Inspection of the graphs in Figure 1 reveal that predicted probability of securities are markedly different for private and public securities. Firms with both high asymmetric information and high risk issue private convertibles and private equity. Firms with lower risk but still high asymmetric information issue private debt. Firms with high risk but low asymmetric information are more likely to issue public equity. All of the graphs quite clearly show that firms move away from issuing public equity and issue other securities as asymmetric information increases. The most important distinction for the decision to issue securities privately is asymmetric information. Risk influences more the type of security that the firm issues conditional upon issuing publicly or privately.

Figure 2 shows how these predicted probabilities vary by size. We construct three different size regions, low, below the 33rd percentile, medium, between the 33rd and 66th percentile and high, above the 66th percentile. We then again vary our asymmetric information and risk variables +/- ten standard deviations away from their size-based mean values, keeping all other variables at the mean values for each respective size group.

**Insert Figure 2 here**

Figure 2 clearly shows that as asymmetric information increases firms are more likely to issue privately. Small firms with both high risk and high asymmetric information are more likely to issue private equity and convertibles. Conditional upon issuing publicly, firms with the highest degree of asymmetric information are more likely to issue public debt - consistent with the Myer's pecking order. However, as before, when issuing privately the security choice is more nuanced. Firms with low risk but high asymmetric information are likely to issue private debt while firms with the highest levels of risk and asymmetric information issue private convertibles for all three size classes.

## 5. Conclusions

In this paper we analyze the public and private security issuance decisions by public companies. Using a comprehensive database of public and private security issues we examine the impact of asymmetric information, risk and corporate governance on security issuance decisions. We show private equity issues are significant in number, especially for smaller firms that potentially have more asymmetric information and higher risk. Our comprehensive sample also shows that private equity and private convertible issues are a substantial fraction of securities issued by public companies. This fraction has also been increasing over time, with the number of private equity issues exceeding public equity issues from the year 2000 to 2003, the last year of our database. The number of private convertibles is greater than the number of public convertibles for all years of our database.

We analyze the factors that are related to the probability a firm chooses to issue public and private equity, public and private convertibles and public and private debt. We have three main results on the relations between security issuance decisions and asymmetric information and risk:

1. Firms that have a high measure of asymmetric information, measured by either analyst earnings dispersion or analyst earnings forecast errors, are significantly more likely to issue securities in the private market.

2. Firms with both high measures of asymmetric information and risk are most likely to issue private equity and in particular private convertibles.

3. Conditional upon issuing in the public market, firms with high asymmetric information are more likely to issue debt and less likely to issue equity. Thus, while a pecking order of issuance decisions where firms with high asymmetric information are more likely to issue debt does not hold overall and is reversed in the private market, we do find such a pecking order conditional upon firms issuing securities in the public market.

We have three main results on risk and corporate governance:

1. Firms with high risk, that are smaller, highly valued but with low cash flows and high indicators of distress are more likely to issue private equity.

2. Firms with high-quality corporate governance are more likely to issue in the private equity market. However corporate governance is economically not very important to the issuance decision.

3. The results on the market reaction to security issuance decisions do however show the market does react positively to a firm with low-quality corporate governance that decides to self-discipline (through the issuance of private debt) and negatively to the issuance of public equity.

Overall our results establish that private markets are quite different from private markets on many different dimensions. The results are consistent with the private issues being sold to investors with better information about, or better ability to evaluate firm prospects. Our results are consistent with asymmetric information being one of the most significant and economically important factors that influences security issuance decisions. We also show that private equity is also more likely to be sold when firms have high risk and thus potential agency conflicts. Firms with lower risk but still high measures of asymmetric information are more likely to issue private debt. The results are consistent with private equity and convertibles being more likely to be issued by firms with asymmetric information and to mitigate potential agency conflicts between equity and debt holders.

# Appendix

The most commonly used model is the multinomial logit model which assumes that the errors $\varepsilon_{ij}$ are i.i.d. extreme value distribution (the cumulative distribution is $e^{-e^{-\varepsilon_j}}$). McFadden (1973) has shown under this assumption for the errors the firm maximization behavior lead to

$$\Pr[Y = j] = \frac{e^{b_j x_i}}{\sum_{k \in J} e^{b_k x_i}}$$

However this model assumes the errors are all i.i.d. which imply that the independence of irrelevant alternatives holds. The economic content of this assumption is that omission of one of the categories will lead to a proportionate increase in the remaining alternatives. Given the restrictiveness of this assumption, we perform Hausman tests of whether this simple model is sufficient to describe the choices. We find that it does not pass this test.

A more general model that we thus consider is a nested logit model. Note that the value function can be decomposed into two observed parts: For Model 2 presented in the text, the first part is the value from making the private-public choice $W_{priv} = b_{priv}x$ (public has been normalized to zero), and the other part is the additional value from making a specific security choice within the nest $Y_j = b_j x$ (debt has been normalized to zero); That is the value of choice $j$ is $V_j = W_k + Y_j + \varepsilon_j$.

To estimate the nested models presented in the text we have to make assumptions about the distribution of the errors. We will allow for a generalized extreme value distribution (GEV). The most widely used GEV model is a nested logit model. The more general distribution of the errors we consider, where the errors have the following cumulative distribution:

$$exp\left(-(e^{-\varepsilon_e/\lambda_{priv}} + e^{-\varepsilon_c/\lambda_{priv}} + e^{-\varepsilon_d/\lambda_{priv}}) - (e^{-\varepsilon_E/\lambda_{pub}} + e^{-\varepsilon_C/\lambda_{pub}} + e^{-\varepsilon_D/\lambda_{pub}})\right)$$

For any two alternatives in two different nests, say private debt and public convertibles, the errors are uncorrelated, the cov($\varepsilon_d$,$\varepsilon_C$) = 0. But for two alternatives in the same nest the errors are correlated. The parameter $1 - \lambda_k$ can be interpreted as the correlation among choices in the same nest. So the parameter $\lambda_k$ measures the degree of independence for the portions of the value for the alternatives within nest $k$ (a lower value indicating more correlation). $\lambda_k = 1$ means the alternatives are independent and multinomial model is appropriate.

The probability that a choice $j$ is made is $P(j) = P(j|k).P(k)$, where k is the choice of branch (public, private) it can be shown that value maximization implies:

$$
\begin{aligned}
P(e|priv) &= \frac{e^{b_e x}}{1+e^{b_e x}+e^{b_c x}}; P(c|priv) = \frac{e^{b_c x}}{1+e^{b_e x}+e^{b_c x}}; P(d|priv) = \frac{1}{1+e^{b_e x}+e^{b_c x}} \\
P(E|pub) &= \frac{e^{b_E x}}{1+e^{b_E x}+e^{b_C x}}; P(C|pub) = \frac{e^{b_C x}}{1+e^{b_E x}+e^{b_C x}}; P(D|pub) = \frac{1}{1+e^{b_E x}+e^{b_C x}}
\end{aligned}
$$

and

$$
P(priv) = \frac{e^{b_{priv} x + \lambda_{priv} I_{priv}}}{e^{\lambda_{pub} I_{pub}} + e^{b_{priv} x + \lambda_{priv} I_{priv}}}; P(pub) = \frac{e^{\lambda_{pub} I_{pub}}}{e^{\lambda_{pub} I_{pub}} + e^{b_{priv} x + \lambda_{priv} I_{priv}}}
$$

where $I_k$ are the inclusive value for nest $k$

$$
I_{priv} = \ln(1 + e^{b_e x} + e^{b_c x}) \text{ and } I_{priv} = \ln(1 + e^{b_E x} + e^{b_C x})
$$

The inclusive values have an important economic interpretation: $\lambda_k I_k$ is the expected value that the firm receives from the choice among the alternatives in the nest $k$.

Note that the odds ratio among to alternatives, say equity and debt, within the same branch, say public, is

$$
\frac{P_E}{P_D} = \frac{\Pr[Y = E]}{\Pr[Y = D]} = e^{b_E x},
$$

so the coefficient $e^{b_{Ek}}$ describe the change in the odds ratio associated with an increase in $x_k$.

Note that the odds ratio among choices in different branches say $\frac{P_e}{P_E}$ under the nested formulation above is a more complicated expression that is a function of all the alternatives.

Another nested logit specification is the one in which the firm first choose the security and then the market (model 1 in the text). In this case the errors have the following distribution

$$
exp\left(-(e^{-\varepsilon_e/\lambda_E} + e^{-\varepsilon_E/\lambda_E}) - (e^{-\varepsilon_c/\lambda_C} + e^{-\varepsilon_C/\lambda_C}) - (e^{-\varepsilon_d/\lambda_D} + e^{-\varepsilon_D/\lambda_D})\right)
$$

Note that under this specification the odds ratio

$$
\frac{P_e}{P_E} = \frac{\Pr[Y = e]}{\Pr[Y = D]} = e^{a_{prive} x},
$$

so the coefficient $e^{a^k_{prive}}$ describe the change in the odds ratio associated with an increase in $x_k$.

We estimate the parameters of these models using the maximum likelihood estimation.

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**Table 1**

**Number and Gross Proceeds of Securities Issued by Year**

Table shows the number of issues, the total gross proceeds raised in millions of dollars, and the mean amount raised as a percent of firm value (%FV) for each year and security-market choice. The source of information is SDC (all public issues and 144-A debt issues), DealScan (private debt), and PlacementTracker (private equity and convertibles and 144-A convertibles). Securities are included if from public companies matched to Compustat and CSRP (financials and regulated utilities are excluded)

| Year | | Public | | | 144-A | | Private | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Debt | Convertibles | Equity | Debt | Convertibles | Debt | Convertibles | Equity | Total |
| | N | 227 | 23 | 219 | 47 | 21 | 501 | 31 | 46 | 1,115 |
| 1995 | $MM | 41,156 | 2,939 | 13,968 | 6,528 | 2,480 | 162,308 | 458 | 598 | 230,435 |
| | %FV | 7% | 24% | 24% | 37% | 18% | 33% | 16% | 12% | 24% |
| | N | 248 | 33 | 271 | 71 | 40 | 657 | 103 | 61 | 1,484 |
| 1996 | $MM | 55,192 | 6,353 | 16,872 | 11,795 | 5,222 | 198,198 | 1,626 | 575 | 295,834 |
| | %FV | 9% | 19% | 26% | 43% | 27% | 32% | 21% | 15% | 26% |
| | N | 245 | 26 | 226 | 188 | 69 | 729 | 152 | 66 | 1,701 |
| 1997 | $MM | 64,252 | 3,792 | 14,263 | 37,259 | 11,433 | 247,914 | 2,546 | 1,147 | 382,605 |
| | %FV | 8% | 21% | 23% | 32% | 27% | 32% | 13% | 13% | 25% |
| | N | 308 | 18 | 147 | 179 | 45 | 633 | 118 | 75 | 1,523 |
| 1998 | $MM | 95,773 | 4,496 | 14,982 | 48,486 | 10,601 | 142,205 | 979 | 657 | 318,178 |
| | %FV | 5% | 11% | 20% | 30% | 18% | 36% | 14% | 11% | 24% |
| | N | 197 | 22 | 172 | 118 | 36 | 601 | 130 | 160 | 1,436 |
| 1999 | $MM | 81,897 | 12,015 | 23,643 | 46,618 | 9,738 | 132,693 | 4,348 | 2,135 | 313,085 |
| | %FV | 8% | 9% | 22% | 24% | 21% | 38% | 14% | 14% | 25% |
| | N | 139 | 22 | 157 | 39 | 61 | 593 | 155 | 197 | 1,363 |
| 2000 | $MM | 56,760 | 11,898 | 29,408 | 32,143 | 19,727 | 172,791 | 9,299 | 6,737 | 338,762 |
| | %FV | 4% | 10% | 24% | 15% | 14% | 34% | 16% | 13% | 23% |
| | N | 200 | 30 | 135 | 139 | 92 | 611 | 139 | 238 | 1,584 |
| 2001 | $MM | 103,786 | 13,957 | 15,903 | 70,439 | 39,870 | 147,454 | 3,382 | 5,491 | 400,281 |
| | %FV | 5% | 7% | 13% | 18% | 10% | 31% | 16% | 14% | 20% |
| | N | 204 | 11 | 127 | 87 | 51 | 605 | 126 | 199 | 1,410 |
| 2002 | $MM | 86,926 | 8,030 | 16,057 | 24,946 | 17,449 | 141,951 | 4,203 | 2,981 | 302,543 |
| | %FV | 4% | 7% | 11% | 19% | 10% | 29% | 13% | 11% | 18% |
| | N | 163 | 14 | 167 | 143 | 176 | 638 | 111 | 254 | 1,666 |
| 2003 | $MM | 82,328 | 9,715 | 18,487 | 41,136 | 41,352 | 151,325 | 2,488 | 4,144 | 350,975 |
| | %FV | 5% | 6% | 21% | 19% | 18% | 29% | 18% | 19% | 21% |
| | N | 1,931 | 199 | 1,621 | 1,011 | 591 | 5,568 | 1,065 | 1,296 | 13,282 |
| Total | $MM | 668,069 | 73,194 | 163,583 | 319,348 | 157,872 | 1,496,838 | 29,330 | 24,464 | 2,932,698 |
| | %FV | 6% | 14% | 21% | 26% | 17% | 33% | 15% | 14% | 23% |
| %FV (med) | | 3% | 9% | 15% | 16% | 13% | 22% | 9% | 9% | 13% |

**Table 2A: Summary Statistics**

Summary statistics by security-market choice in the year prior to the issue. Analyst earnings surprise is the absolute value of of actual earnings less median analyst forecast divided the price per share. Analyst earnings dispersion is the standard deviation of analyst earnings estimates divided the price per share. Corporate governance (ordered from 1-worst-to 4-best) is based on whether the firm has dual class voting stock, classified board, restrictions on shareholders to call special meeting or on action by written consent. Cash flow volatility is the standard deviation of operating cash flow using up to twenty quarters prior to the issue. Financial distress is Altman's Z-score less than 1.81. Tobin's q is market to book value. Cumulative abnormal return is the excess return relative to a portfolio of firms in the same size decile. Debt to asset ratio is long term debt divided by book value of assets. The corporate marginal tax rate is computed as in Graham (1996). Firm value is market value of equity plus book values of preferred stock and total debt.

| Security/Market | | Analyst Earnings Surprise | Analyst Earnings Dispersion | Corporate Governance | Cash flow Volatility | R&D / PPE | Profitability (OCF/Assets) | Financial Distress | Tobin's *q* | Cumulative Ab. Return prior 250 days | Debt/Asset | Marginal Tax Rate (%) | Firm Value ($ Millions) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Public Debt | Mean | 0.7% | 1.0% | 2.3 | 2.5% | 13.5% | 18.1% | 9.7% | 1.6 | 3.9% | 26.5% | 24.7% | 24,571 |
| | Med | 0.3% | 0.2% | 2.0 | 1.9% | 2.6% | 17.5% | 0.0% | 1.3 | -1.3% | 24.7% | 35.0% | 7,839 |
| | Stdev | 1.8% | 4.4% | 1.2 | 2.7% | 29.5% | 8.2% | 29.7% | 1.1 | 35.3% | 14.9% | 14.7% | 44,471 |
| | N | 1,866 | 1,829 | 1,863 | 1,931 | 1,931 | 1,931 | 1,931 | 1,931 | 1,931 | 1,931 | 1,810 | 1,931 |
| Public Convertibles | Mean | 1.7% | 1.6% | 2.2 | 4.1% | 32.1% | 12.7% | 21.1% | 2.0 | 45.1% | 27.9% | 18.5% | 9,711 |
| | Med | 0.5% | 0.4% | 2.0 | 2.4% | 0.0% | 14.0% | 0.0% | 1.4 | 15.0% | 27.2% | 20.0% | 2,533 |
| | Stdev | 4.1% | 4.4% | 1.3 | 5.5% | 102.1% | 18.6% | 40.9% | 1.9 | 119.6% | 17.4% | 15.9% | 24,248 |
| | N | 186 | 178 | 173 | 199 | 199 | 199 | 199 | 199 | 199 | 199 | 177 | 199 |
| Public Equity | Mean | 1.6% | 0.9% | 2.4 | 7.9% | 108.6% | 11.4% | 13.0% | 2.6 | 79.7% | 22.4% | 18.2% | 1,459 |
| | Med | 0.6% | 0.3% | 2.0 | 4.5% | 4.2% | 16.3% | 0.0% | 1.8 | 37.4% | 18.0% | 21.4% | 374 |
| | Stdev | 4.7% | 2.4% | 1.2 | 13.2% | 229.7% | 26.9% | 33.7% | 2.3 | 148.5% | 22.2% | 16.2% | 5,349 |
| | N | 1,501 | 1,351 | 1,158 | 1,621 | 1,621 | 1,621 | 1,621 | 1,621 | 1,621 | 1,621 | 1,314 | 1,621 |
| 144-A Convertibles | Mean | 2.7% | 1.8% | 2.2 | 3.9% | 13.0% | 15.2% | 31.3% | 1.4 | 18.3% | 37.4% | 17.8% | 5,331 |
| | Med | 0.7% | 0.5% | 2.0 | 2.5% | 0.0% | 14.6% | 0.0% | 1.1 | 3.9% | 35.8% | 17.4% | 1,149 |
| | Stdev | 7.9% | 5.2% | 1.2 | 4.9% | 44.2% | 14.1% | 46.4% | 1.1 | 74.6% | 22.1% | 15.9% | 17,854 |
| | N | 938 | 864 | 811 | 1,011 | 1,011 | 1,011 | 1,011 | 1,011 | 1,011 | 1,011 | 908 | 1,011 |
| 144-A Debt | Mean | 2.2% | 1.4% | 2.5 | 6.2% | 101.4% | 10.4% | 17.6% | 2.3 | 48.4% | 23.6% | 15.0% | 4,288 |
| | Med | 0.6% | 0.4% | 2.0 | 3.7% | 12.2% | 12.1% | 0.0% | 1.6 | 16.1% | 20.2% | 3.6% | 1,218 |
| | Stdev | 7.5% | 4.3% | 1.2 | 10.6% | 217.9% | 21.7% | 38.1% | 2.4 | 148.0% | 22.0% | 15.8% | 9,536 |
| | N | 572 | 553 | 521 | 591 | 591 | 591 | 591 | 591 | 591 | 591 | 494 | 591 |
| Private Debt | Mean | 3.7% | 1.6% | 2.3 | 4.8% | 29.1% | 15.6% | 13.8% | 1.4 | 4.8% | 23.6% | 20.6% | 2,784 |
| | Med | 0.7% | 0.4% | 2.0 | 3.0% | 0.9% | 15.1% | 0.0% | 1.1 | -5.9% | 20.7% | 31.0% | 469 |
| | Stdev | 12.2% | 5.0% | 1.2 | 7.1% | 86.8% | 14.7% | 34.5% | 1.2 | 66.1% | 19.8% | 15.6% | 10,985 |
| | N | 4,755 | 4,145 | 4,033 | 5,568 | 5,568 | 5,568 | 5,568 | 5,568 | 5,568 | 5,568 | 4,964 | 5,568 |
| Private Convertibles | Mean | 17.2% | 6.0% | 2.8 | 16.5% | 163.5% | -21.3% | 31.4% | 2.7 | -0.7% | 16.5% | 4.5% | 376 |
| | Med | 5.8% | 2.0% | 3.0 | 11.0% | 58.3% | -16.6% | 0.0% | 1.7 | -30.7% | 8.0% | 0.7% | 69 |
| | Stdev | 29.5% | 10.8% | 1.2 | 19.7% | 258.2% | 34.8% | 46.4% | 2.7 | 126.9% | 21.3% | 10.0% | 1,793 |
| | N | 592 | 383 | 834 | 1,065 | 1,065 | 1,065 | 1,065 | 1,065 | 1,065 | 1,065 | 895 | 1,065 |
| Private Equity | Mean | 13.1% | 4.6% | 2.8 | 17.3% | 246.2% | -24.5% | 24.8% | 3.1 | 22.7% | 12.6% | 4.4% | 427 |
| | Med | 3.4% | 1.4% | 3.0 | 11.1% | 109.9% | -20.3% | 0.0% | 2.1 | -10.5% | 3.8% | 0.8% | 81 |
| | Stdev | 25.3% | 8.8% | 1.2 | 22.4% | 337.9% | 36.0% | 43.2% | 2.8 | 129.0% | 18.9% | 9.8% | 2,012 |
| | N | 815 | 561 | 1,109 | 1,296 | 1,296 | 1,296 | 1,296 | 1,296 | 1,296 | 1,296 | 1,098 | 1,296 |
| Total | Mean | 4.1% | 1.7% | 2.4 | 7.0% | 70.5% | 8.3% | 17.2% | 1.9 | 18.7% | 23.4% | 17.7% | 5,731 |
| | Med | 0.7% | 0.4% | 2.0 | 3.4% | 3.6% | 13.8% | 0.0% | 1.3 | -0.1% | 20.2% | 16.0% | 548 |
| | Stdev | 13.6% | 5.4% | 1.2 | 12.4% | 184.4% | 25.9% | 37.7% | 1.9 | 99.4% | 20.6% | 16.1% | 21,025 |
| | N | 11,225 | 9,864 | 10,502 | 13,282 | 13,282 | 13,282 | 13,282 | 13,282 | 13,282 | 13,282 | 11,660 | 13,282 |

**Table 2B**

**Summary Statistics: Tests of Differences in Markets**

The first row presents the t-statistics for the equality of means of each variable in Table 2A by market, and the second row presents the Mann-Whitney two-sample statistics.

| Statistics for difference in Market | Analyst Earnings Surprise | Analyst Earnings Dispersion | Corporate Governance | Cash flow Volatility | R&D / PPE | Profitability (OCF/Assets) | Financial Distress | Tobin's *q* | Cumulative Ab. Return prior 250 days | Debt/ Assets | Marginal Tax Rate | Firm Value ($ Millions) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Private Debt | 10.6 [a] | 4.5 [a] | 2.3 [b] | 14.2 [a] | 7.7 [a] | -7.3 [a] | 4.6 [a] | -4.3 [a] | 0.6 | -6.0 [a] | -9.7 [a] | -33.7 [a] |
| vs Public Debt | 23.0 [a] | 13.4 [a] | 1.9 [c] | 25.2 [a] | -2.2 [b] | -10.0 [a] | 4.6 [a] | -9.6 [a] | -5.9 [a] | -9.8 [a] | -10.8 [a] | -50.5 [a] |
| Private Debt | 2.4 [b] | -1.0 | 2.6 [a] | 4.0 [a] | 5.8 [a] | 0.7 | -14.0 [a] | 0.9 | -5.8 [a] | -20.1 [a] | 4.8 [a] | -6.1 [a] |
| vs 144-A Debt | -0.4 | -4.1 [a] | 2.8 [a] | 7.0 [a] | 5.5 [a] | 1.3 | -13.7 [a] | 0.0 | -6.9 [a] | -18.9 [a] | 4.4 [a] | -16.7 [a] |
| 144-A Debt | 10.5 [a] | 4.2 [a] | -0.9 | 10.1 [a] | -0.4 | -7.1 [a] | 15.3 [a] | -3.9 [a] | 7.1 [a] | 15.8 [a] | -11.1 [a] | -13.2 [a] |
| vs Public Debt | 16.6 [a] | 13.1 [a] | -1.3 | 11.2 [a] | -7.1 [a] | -8.4 [a] | 14.7 [a] | -7.2 [a] | 3.0 [a] | 13.5 [a] | -10.6 [a] | -27.9 [a] |
| Private Convertibles | 7.1 [a] | 5.2 [a] | 5.6 [a] | 8.8 [a] | 7.1 [a] | -13.4 [a] | 2.9 [a] | 3.1 [a] | -4.7 [a] | -7.1 [a] | -15.2 [a] | -12.4 [a] |
| vs Public Convertibles | 14.1 [a] | 10.3 [a] | 5.6 [a] | 16.4 [a] | 9.7 [a] | -15.4 [a] | 2.9 [a] | 2.9 [a] | -9.6 [a] | -9.4 [a] | -11.2 [a] | -18.9 [a] |
| Private Convertibles | 11.8 [a] | 9.0 [a] | 4.5 [a] | 11.8 [a] | 5.0 [a] | -20.1 [a] | 6.1 [a] | 2.4 [b] | -7.1 [a] | -6.4 [a] | -15.3 [a] | -13.0 [a] |
| vs 144-A Convertibles | 20.0 [a] | 14.5 [a] | 4.4 [a] | 20.2 [a] | 6.0 [a] | -20.6 [a] | 6.1 [a] | 1.7 [c] | -14.5 [a] | -7.4 [a] | -14.8 [a] | -29.0 [a] |
| 144-A Convertibles | 0.9 | -0.4 | 2.5 [b] | 2.7 [a] | 4.3 [a] | -1.4 | -1.1 | 1.6 | 0.3 | -2.6 [b] | -2.5 [b] | -4.5 [a] |
| Public Convertibles | 0.3 | -0.4 | 2.8 [a] | 5.6 [a] | 6.2 [a] | -1.9 [c] | -1.1 | 1.9 [c] | 0.1 | -4.0 [a] | -1.8 [c] | -3.9 |
| Private Equity | 17.0 [a] | 14.4 [a] | 7.4 [a] | 14.1 [a] | 13.1 [a] | -30.8 [a] | 8.3 [a] | 4.4 [a] | -10.9 [a] | -12.6 [a] | -24.6 [a] | -6.6 [a] |
| vs Public Equity | 23.9 [a] | 19.1 [a] | 7.2 [a] | 22.9 [a] | 17.7 [a] | -30.0 [a] | 8.2 [a] | 2.6 [a] | -19.7 [a] | -13.1 [a] | -21.0 [a] | -25.9 [a] |

a, b,c- represent significance levels of one, five, and ten percent.

**Table 3A**
**Market Reaction to Security Issuance**

Table presents the cummulative abnormal returns around security issues using 1, 5, 10, and 21 trading-day event windows. Excess returns are obtained from a market model estimated using the last 250 trading days prior to the event window.

| Security-Market | Day -1 to +1 Mean | Day -1 to +1 Median | Day -5 to +5 Mean | Day -5 to +5 Median | Day -10 to +10 Mean | Day -10 to +10 Median | Day -21 to +21 Mean | Day -21 to +21 Median |
|---|---|---|---|---|---|---|---|---|
| Public Debt | -0.15% | -0.22% | 0.22% | -0.01% | 0.28% | 0.01% | 0.34% | -0.03% |
| Public Convertibles | -3.84% [a] | -3.56% | -3.59% [a] | -3.64% | -3.03% [a] | -3.32% | -1.36% [c] | -1.94% |
| Public Equity | -1.91% [a] | -1.84% | -3.24% [a] | -3.16% | -3.50% [a] | -3.43% | -6.11% [a] | -5.80% |
| Private Debt | 0.45% [a] | 0.10% | 0.88% [a] | 0.23% | 0.68% [a] | 0.16% | 0.65% [a] | -0.07% |
| Private Convertibles | 2.15% [a] | 0.32% | 1.48% [a] | -1.87% | 1.74% [a] | -0.82% | 1.28% [c] | -1.36% |
| Private Equity | 2.10% [a] | 0.19% | 3.31% [a] | 0.18% | 4.35% [a] | 0.94% | 4.89% [a] | 2.05% |

a,b,c - Significantly different from zero using a two-tailed test at the one-percent (five, ten) level of significance.

**Table 3B**
**Market Reaction to Security Issuance**

Table presents regression of 21 trading-day cumulative abnormal returns around security issues on the variables defined in Table 2A. All explanatory variables (except the dummy variable financial distress) have been normalized by their standard deviation.

| | Equity Issues | | Convertible Issues | | Debt Issues | |
|---|---|---|---|---|---|---|
| | coef. | t-stat | coef. | t-stat | coef. | t-stat |
| Public Market | -4.45% [a] | (-4.81) | -1.08% | (-.96) | -0.27% | (-.42) |
| Private Market | 2.54% [c] | (1.68) | 0.98% | (.58) | -0.48% | (-.92) |
| Analyst Earnings Surprise | | | | | | |
| *Public Market | -2.71% | (-1.31) | 0.41% | (.29) | 0.44% | (.44) |
| *Private Market | 2.10% [a] | (2.81) | -0.51% | (-.79) | 1.24% [c] | (1.77) |
| Corporate Governance | | | | | | |
| *Public Market | 1.20% [c] | (1.77) | 0.00% | (.00) | 0.10% | (.36) |
| *Private Market | -0.94% | (-.80) | -1.21% | (-.96) | -0.50% [c] | (-1.69) |
| Cash Flow Volatility | 0.58% | (.69) | -1.22% [c] | (-1.77) | -0.83% | (-1.09) |
| R&D / Net Fixed Assets | 0.47% | (.74) | 1.04% | (1.49) | 0.14% | (.13) |
| Profitability (Operating Cash Flow) | -0.91% | (-1.09) | 0.00% | (.00) | -0.40% | (-.54) |
| Financial Distress | 5.05% [a] | (2.62) | 1.91% | (.93) | 1.92% [b] | (2.40) |
| Tobin's *q* | -0.62% | (-.91) | -0.11% | (-.14) | -0.53% | (-1.08) |
| Cumulative Ab. Stock Return (250 days before) | -1.61% [a] | (-2.58) | -0.70% | (-.75) | -5.13% [a] | (-10.94) |
| Debt/Asset Ratio (Industry Adjusted) | -0.14% | (-.25) | -0.63% | (-.88) | 0.58% [b] | (2.11) |
| Marginal Tax Rate | 1.23% [c] | (1.74) | -0.46% | (-.57) | -0.10% | (-.42) |
| Log Size (firm value) | 0.37% | (.37) | -0.61% | (-.52) | -0.30% | (-.98) |
| Cumulative Market Return (250 days before) | -0.45% | (-.67) | -0.26% | (-.33) | -0.61% [a] | (-2.58) |
| Number of observations | 1,598 | | 1,075 | | 5,797 | |
| F-value | 6.83 | | 0.78 | | 10.09 | |
| Adjusted $R^2$ | 7.02% | | 1.20% | | 4.80% | |

a,b,c - Significantly different from zero at the one-percent (five, ten) level of significance.

**Table 4**
**Choice of Security Issuance in Public and Private Markets**

Table presents coefficient estimates from a nested logit regression testing the impact of asymmetric information and risk on firm public and private security choice by public firms. First stage is the decision of security type with coefficients representing tendency relative to debt. Second stage is the choice of market conditional on security type, with coefficients representing tendency versus public issuance. All firm-specific variables are lagged. Explanatory variables are as defined in Table 2A and they have all been normalized by their standard deviation (except the dummy variable financial distress). Analyst earnings surprise is the absolute value of actual earnings less median analyst forecast divided the price per share. (Robust Z-statistics are presented in parentheses.) Chi-squared statistic for test of overall significance is 11624 (p-value .001). Sample is 8470 security issues.

| | First Stage | | Second Stage: Public versus Private | | |
|---|---|---|---|---|---|
| **Explanatory Variables** | **Security Decision** | | Private | Private | Private |
| Asymmetric Information Measure | Convertibles | Equity | Equity | Convertibles | Debt |
| Analyst Earnings Surprise | -0.008 | -0.462 [b] | 1.308 [a] | 0.483 [a] | 0.279 [a] |
| | (-.090) | (-2.260) | (5.940) | (3.540) | (3.470) |
| Measures of Risk and Investment Opportunities | | | | | |
| Cash Flow Volatility | 0.294 [a] | 0.359 [a] | -0.019 | 0.170 [c] | 0.104 |
| | (3.750) | (4.970) | (-.390) | (1.790) | (1.010) |
| R&D / Net Fixed Assets | 0.512 [a] | 0.527 [a] | -0.113 [b] | -0.184 [b] | 0.456 [a] |
| | (3.920) | (4.270) | (-2.280) | (-2.370) | (3.080) |
| Profitability | -0.660 [a] | -0.538 [a] | -0.603 [a] | -0.279 [a] | -0.126 |
| (Operating Cash Flow) | (-8.560) | (-7.270) | (-8.070) | (-2.750) | (-1.510) |
| Financial Distress | -0.013 | 0.024 | -0.086 | 0.270 | -0.444 [a] |
| (Z-score<1.81) | (-.090) | (.190) | (-.410) | (1.040) | (-4.350) |
| Tobin's *q* | 0.679 [a] | 0.771 [a] | 0.226 [a] | 0.250 [a] | 0.497 [a] |
| | (7.750) | (8.560) | (3.910) | (3.160) | (7.170) |
| Corporate Governance | 0.095 [b] | 0.036 | 0.180 [a] | -0.050 | 0.057 [c] |
| | (2.270) | (.960) | (2.640) | (-.560) | (1.750) |
| Log Size | -0.324 [a] | -1.252 [a] | -0.899 [a] | -2.410 [a] | -1.442 [a] |
| (Firm Value) | (-1.950) | (-5.810) | (-7.250) | (-13.980) | (-31.640) |
| Debt and Taxes | | | | | |
| Debt/Asset Ratio | 0.092 [b] | 0.148 [a] | -0.011 | 0.189 [b] | -0.024 |
| (Industry Adjusted) | (2.120) | (3.810) | (-.160) | (2.160) | (-.680) |
| Marginal Tax Rate | -0.228 [a] | -0.107 [a] | -0.355 [a] | -0.182 | 0.034 |
| | (-4.620) | (-2.450) | (-3.830) | (-1.610) | (.960) |
| Market Timing & Market Characteristics | | | | | |
| Cumulative Abnormal Stock Return | 0.470 [c] | 0.544 [a] | -0.320 [a] | -0.559 [a] | -0.186 [a] |
| (250 prior days) | (8.790) | (10.510) | (-6.160) | (-6.000) | (-3.420) |
| Cumulative Market Return | 0.079 [c] | 0.176 [a] | -0.093 | -0.191 [b] | 0.029 |
| (Prior year) | (1.690) | (4.260) | (-1.360) | (-1.920) | (.730) |
| Aaa Bond Rate | -0.153 [a] | 0.223 [a] | 0.067 | 0.665 [a] | 0.304 [a] |
| | (-2.480) | (3.290) | (.810) | (5.880) | (7.310) |
| Credit Spread: Baa - Aaa | 0.079 | 0.310 [a] | 0.429 [b] | 0.216 [c] | 0.364 [a] |
| | (1.040) | (4.320) | (4.960) | (1.790) | (7.540) |
| Constant | -1.410 [c] | -1.200 [b] | -1.559 [a] | -1.614 [a] | 1.192 [a] |
| | (-4.230) | (-3.570) | (-11.790) | (-11.180) | (16.410) |

a,b,c - Significantly different from zero at the one-percent (five, ten) level of significance.

**Table 5A**
**Economic Effects - Security First Model**

This table illustrates the economic significance of our results. We compute the predicted probability for each deal in our dataset using the nested logit model of Table 4. Then we vary each specific variable by +/- 1/2 of its standard deviation, and evaluate the change in each predicted probability, keeping all other variables fixed. We then average the marginal effects over all firms in the sample. The last column is the sum of the absolute value of the marginal effects on each choice.

| | Public Debt | Public Convertibles | Public Equity | Private Debt | Private Convertibles | Private Equity | Total Variation |
|---|---|---|---|---|---|---|---|
| Analyst Earnings Surprise | -2.5% | -0.2% | -6.4% | 5.5% | 1.3% | 2.3% | 18.1% |
| Cash Flow Volatility | -2.6% | 1.0% | 2.0% | -1.8% | 0.8% | 0.5% | 8.7% |
| Corporate Governance | -1.0% | 0.5% | -0.3% | 0.2% | 0.0% | 0.6% | 2.5% |
| Marginal Tax Rate | 0.4% | -1.0% | 0.3% | 2.4% | -0.9% | -1.1% | 6.0% |
| R&D / Net Fixed Assets | -7.3% | 2.1% | 2.8% | 1.8% | 0.2% | 0.5% | 14.6% |
| Profitability | 4.1% | -2.7% | -1.5% | 4.4% | -1.7% | -2.6% | 16.9% |
| Financial Distress | 5.1% | 0.0% | 0.8% | -6.6% | 0.9% | -0.2% | 13.7% |
| Tobin's *q* | -8.7% | 2.3% | 3.5% | -0.2% | 1.2% | 1.9% | 17.9% |
| Debt/Asset Ratio | -0.2% | 0.2% | 1.0% | -1.7% | 0.6% | 0.2% | 3.8% |
| Log Size | 19.7% | 3.0% | -4.5% | -9.7% | -3.8% | -4.8% | 45.3% |
| Cumulative Abnormal Stock Return | 0.1% | 2.6% | 4.3% | -7.0% | -0.6% | 0.6% | 15.2% |
| Cumulative Market Return | -0.8% | 0.4% | 1.4% | -0.7% | -0.6% | 0.4% | 4.2% |
| Aaa Bond Rate | -3.6% | -2.0% | 1.2% | 3.2% | 0.5% | 0.7% | 11.2% |
| Credit Spread: Baa - Aaa | -5.0% | -0.5% | 0.9% | 2.7% | -0.3% | 2.2% | 11.6% |

**Table 5B**
**Predicted versus Actual Choices**

For each choice made by firms, this table shows the predicted choices made using the model and coefficients of Table 4. The predicted choice is the maximum probability over the six possible choices in Table 4. For each type of security issued, the first row gives the number predicted to choose the security given in the column header. The second row gives the percentage predicted to choose that security versus the actual choice. The third row gives the percentage of observed, predicted pairs divided by the overall number predicted to issue that security.

| | Predicted Choice | | | | | | |
|---|---|---|---|---|---|---|---|
| Observed Choice | Public Debt | Public Convertibles | Public Equity | Private Debt | Private Convertibles | Private Equity | Observed Count |
| Public Debt | 1,490 | 9 | 23 | 892 | 1 | 2 | 2,417 |
| | 62% | 0% | 1% | 37% | 0% | 0% | 100% |
| | 62% | 13% | 5% | 19% | 1% | 0% | 29% |
| Public Convertible | 166 | 24 | 66 | 306 | 0 | 23 | 585 |
| | 28% | 4% | 11% | 52% | 0% | 4% | 100% |
| | 7% | 35% | 15% | 7% | 0% | 3% | 7% |
| Public Equity | 85 | 14 | 206 | 547 | 3 | 85 | 940 |
| | 9% | 1% | 22% | 58% | 0% | 9% | 100% |
| | 4% | 20% | 46% | 12% | 2% | 12% | 11% |
| Private Debt | 636 | 10 | 78 | 2,596 | 21 | 39 | 3,380 |
| | 19% | 0% | 2% | 77% | 1% | 1% | 100% |
| | 26% | 14% | 18% | 55% | 12% | 6% | 40% |
| Private Convertibels | 11 | 4 | 26 | 171 | 90 | 188 | 490 |
| | 2% | 1% | 5% | 35% | 18% | 38% | 100% |
| | 0% | 6% | 6% | 4% | 50% | 27% | 6% |
| Private Equity | 14 | 8 | 46 | 168 | 64 | 358 | 658 |
| | 2% | 1% | 7% | 26% | 10% | 54% | 100% |
| | 1% | 12% | 10% | 4% | 36% | 52% | 8% |
| Predicted Count | 2,402 | 69 | 445 | 4,680 | 179 | 695 | 8,470 |
| | 28% | 1% | 5% | 55% | 2% | 8% | 100% |
| | 100% | 100% | 100% | 100% | 100% | 100% | 100% |

| | Predicted Market | |
|---|---|---|
| Observed Market | Public | Private |
| Public | 2,083 | 1,859 |
| | 53% | 47% |
| | 71% | 33% |
| Private | 833 | 3,695 |
| | 18% | 82% |
| | 29% | 67% |

| Observed | Predicted Security | | |
|---|---|---|---|
| Security | Debt | Convertibles | Equity |
| Debt | 5,614 | 41 | 142 |
| | 97% | 1% | 2% |
| | 79% | 17% | 12% |
| Convertible | 654 | 118 | 303 |
| | 61% | 11% | 28% |
| | 9% | 48% | 27% |
| Equity | 814 | 89 | 695 |
| | 51% | 6% | 43% |
| | 11% | 36% | 61% |

**Table 6**
**Choice of Security Issuance in Public and Private Markets**

Table presents coefficient estimates from a nested logit regression testing the impact of asymmetric information and risk on firm public and private security choice by public firms. First stage is the decision of market with coefficients representing tendency relative to the public market. Second stage is the choice of security conditional on market, with coefficients representing tendency versus debt issuance. All firm-specific variables are lagged. Explanatory variables are as defined in Table 2A and they have all been normalized by their standard deviation (except the dummy variable financial distress). Analyst earnings surprise is the absolute value of actual earnings less median analyst forecast divided the price per share. (Robust Z-statistics are presented in parentheses.) Chi-squared statistic for test of overall significance is 11643 (p-value .001). Sample is 8470 security issues.

| | **First Stage Market Decision** | **Second Stage Security Decision** | | | |
|---|---|---|---|---|---|
| **Explanatory Variables** | Private | Public | Public | Private | Private |
| Asymmetric Information Measure | (vs. Public) | Equity | Convertibles | Equity | Convertibles |
| Analyst Earnings Surprise | 0.325 [a] | -0.914 [a] | 0.046 | 0.080 [c] | 0.154 [a] |
| | (4.070) | (-4.320) | (.390) | (1.860) | (3.830) |
| Measures of Risk and Investment Opportunities | | | | | |
| Cash Flow Volatility | 0.112 | 0.467 [a] | 0.364 [a] | 0.262 [a] | 0.301 [a] |
| | (1.120) | (4.220) | (3.080) | (4.040) | (4.580) |
| R&D / Net Fixed Assets | 0.295 [c] | 0.771 [a] | 0.803 [a] | 0.262 [a] | 0.165 [a] |
| | (1.870) | (5.070) | (5.220) | (4.250) | (2.470) |
| Profitability | -0.070 | -0.589 [a] | -0.784 [a] | -0.891 [a] | -0.805 [a] |
| (Operating Cash Flow) | (-.800) | (-5.920) | (-7.580) | (-11.450) | (-10.090) |
| Financial Distress | -0.407 [a] | -0.082 | -0.170 | 0.267 [c] | 0.342 [b] |
| (Z-score<1.81) | (-4.250) | (-.550) | (-1.110) | (1.680) | (2.100) |
| Tobin's q | 0.386 [a] | 0.980 [a] | 0.889 [a] | 0.660 [a] | 0.599 [a] |
| | (4.590) | (12.340) | (11.270) | (10.670) | (8.930) |
| Corporate Governance | 0.043 | 0.054 | 0.107 [b] | 0.149 [a] | 0.090 |
| | (1.410) | (1.130) | (2.130) | (2.720) | (1.530) |
| Log Size | -1.350 [a] | -1.921 [a] | -0.713 [a] | -1.340 [a] | -1.415 [a] |
| (Firm Value) | (-19.950) | (-23.900) | (-10.670) | (-13.760) | (-13.900) |
| Debt and Taxes | | | | | |
| Debt/Asset Ratio | -0.021 | 0.165 [a] | 0.086 [c] | 0.124 [b] | 0.210 [a] |
| (Industry Adjusted) | (-.640) | (3.350) | (1.670) | (2.180) | (3.560) |
| Marginal Tax Rate | 0.043 | -0.062 | -0.167 [a] | -0.497 [a] | -0.399 [a] |
| | (1.280) | (-1.160) | (-2.970) | (-6.200) | (-4.840) |
| Market Timing & Market Characteristics | | | | | |
| Cumulative Abnormal Stock Return | -0.265 [a] | 0.492 [a] | 0.451 [a] | 0.351 [a] | 0.076 |
| (250 prior days) | (-4.420) | (7.960) | (6.980) | (6.270) | (1.020) |
| Cumulative Market Return | -0.010 | 0.197 [a] | 0.068 | 0.122 [b] | -0.023 |
| (Prior year) | (-.250) | (3.590) | (1.170) | (2.180) | (-.370) |
| Aaa Bond Rate | 0.297 [a] | 0.403 [a] | -0.104 [c] | 0.152 [b] | 0.188 [a] |
| | (7.410) | (6.540) | (-1.660) | (2.290) | (2.510) |
| Credit Spread: Baa - Aaa | 0.339 [a] | 0.457 [a] | 0.212 [a] | 0.514 [a] | 0.133 [c] |
| | (7.260) | (6.560) | (2.910) | (7.440) | (1.730) |
| Constant | 0.983 [a] | -0.361 [a] | -0.529 [a] | -3.134 [a] | -3.237 [a] |
| | (6.610) | (-4.100) | (-6.260) | (-28.520) | (-28.620) |

a,b,c - Significantly different from zero at the one-percent (five, ten) level of significance.

**Table 7**
**Economic Effects - Market First Model**

This table illustrates the economic significance of our results. We compute the predicted probability for each deal in our dataset using the nested logit model of Table 6. Then we vary each specific variable by +/- 1/2 of its standard deviation, and evaluate the change in each predicted probability, keeping all other variables fixed. We then average the marginal effects over all firms in the sample. The last column is the sum of the absolute value of the marginal effects on each choice.

| | Public Debt | Public Convertibles | Public Equity | Private Debt | Private Convertibles | Private Equity | Total Variation |
|---|---|---|---|---|---|---|---|
| Analyst Earnings Surprise | -1.8% | 0.3% | -9.5% | 8.3% | 1.4% | 1.4% | 22.6% |
| Cash Flow Volatility | -3.0% | 1.1% | 2.2% | -1.3% | 0.7% | 0.5% | 8.7% |
| Corporate Governance | -0.9% | 0.4% | -0.2% | 0.0% | 0.1% | 0.6% | 2.1% |
| Marginal Tax Rate | 0.3% | -0.7% | 0.3% | 2.6% | -0.8% | -1.6% | 6.2% |
| R&D / Net Fixed Assets | -6.4% | 2.8% | 3.1% | -0.1% | 0.0% | 0.6% | 13.0% |
| Profitability | 4.0% | -3.2% | -1.9% | 5.0% | -1.6% | -2.4% | 18.0% |
| Financial Distress | 4.6% | 0.1% | 1.4% | -6.9% | 0.7% | 0.2% | 13.9% |
| Tobin's *q* | -8.2% | 2.5% | 3.4% | -0.7% | 1.2% | 1.8% | 17.7% |
| Debt/Asset Ratio | -0.4% | 0.3% | 1.1% | -1.6% | 0.6% | 0.1% | 3.9% |
| Log Size | 19.8% | 3.0% | -4.1% | -9.9% | -4.2% | -4.6% | 45.6% |
| Cumulative Abnormal Stock Return | 0.7% | 2.7% | 4.5% | -7.7% | -0.9% | 0.6% | 17.2% |
| Cumulative Market Return | -0.4% | 0.2% | 1.4% | -1.2% | -0.4% | 0.4% | 4.1% |
| Aaa Bond Rate | -3.7% | -2.1% | 1.3% | 3.2% | 0.7% | 0.6% | 11.6% |
| Credit Spread: Baa - Aaa | -5.1% | -0.6% | 0.8% | 2.6% | -0.2% | 2.4% | 11.7% |

**Table 8**
**Choice of Security: Debt versus Equity**

Table presents coefficient estimates from simple binomial logit regressions combining security issues into equity and debt groups with no indication of choice of market, nor choice of convertible securities. The dependent variable equals one for equity issues and zero for debt issues. All firm-specific variables are lagged. All market-specific variables represent three months prior to the security issuance. For the measure of asymmetric information, column 1 uses analyst earnings dispersion calculated as the standard deviation of the analyst forecasts divided by price per share. Column 2 uses the earnings forecast surprise calculated as the absolute value of the median forecast less the actual earnings divided by the price per share. All explanatory variables are as defined in Table 2A and they have all been normalized by their standard deviation (except the dummy variable financial distress). (Robust Z-statistics are presented in parentheses). a,b,c - Significantly different from zero at the one-percent (five, ten) level of significance.

| **Explanatory Variables** | Analyst Earnings Dispersion | Earnings Forecast Surprise |
|---|---|---|
| Measures of Asymmetric Information | -0.034 | -0.008 |
| | (-.920) | (-.270) |
| Measures of Risk and Investment Opportunities | | |
| Cash Flow Volatility | 0.193 [a] | 0.148 [a] |
| | (2.970) | (2.700) |
| R&D / Net Fixed Assets | 0.100 [c] | 0.122 [b] |
| | (1.880) | (2.540) |
| Profitability | -0.392 [a] | -0.373 [a] |
| (Operating Cash Flow) | (-5.960) | (-6.570) |
| Financial Distress | 0.324 [a] | 0.261 [b] |
| (Z-score < 1.81) | (2.980) | (2.550) |
| Tobin's *q* | 0.429 [a] | 0.424 [a] |
| | (8.120) | (8.560) |
| Corporate Governance | 0.029 | 0.034 |
| | (.790) | (.990) |
| Log Firm Size | -1.118 [a] | -1.074 [a] |
| (firm value) | (-17.700) | (-18.810) |
| Debt and Taxes | | |
| Debt/Asset Ratio | 0.127 [a] | 0.112 [a] |
| (Industry Adjusted) | (3.090) | (3.010) |
| Marginal Tax Rate | -0.162 [a] | -0.193 [a] |
| | (-3.740) | (-4.770) |
| Market Timing & Market Characteristics | | |
| Cumulative Abnormal Stock Return | 0.354 [a] | 0.344 [a] |
| (250 prior days) | (7.390) | (7.950) |
| Cumulative Market Return | 0.084 [b] | 0.114 [a] |
| (Prior year) | (2.120) | (3.230) |
| Aaa Bond Rate | 0.231 [a] | 0.196 [a] |
| | (5.650) | (5.190) |
| Credit Spread: Baa - Aaa | 0.235 [a] | 0.219 [a] |
| | (5.150) | (5.200) |
| Constant | -1.171 [a] | -1.194 [a] |
| | (-28.090) | (-30.730) |
| Number of issues | 7,681 | 8,470 |
| Pseudo R-squared | 25.5% | 27.4% |

**Table 9A**
**Choice of Security Issuance in Public and Private Markets**

Table presents coefficient estimates from a nested logit regression testing the impact of asymmetric information and agency costs on public and private security issues by public firms. First stage is the decision of security with coefficients representing tendency relative to debt. Second stage is the choice of market conditional on security type, with coefficients representing tendency versus public market issuance. All firm-specific variables are lagged. Explanatory variables are as defined in Table 2A and they have all been normalized by their standard deviation (except the dummy variable financial distress). (Robust Z-statistics are presented in parentheses.) Chi-squared statistic for test of overall significance is 12374 (p-value .001). Sample is 7681 security issues.

| | First Stage Security Decision | | Second Stage Market Decision (vs. Public Market) | | | | |
|---|---|---|---|---|---|---|---|
| **Explanatory Variables** | Equity | Convertibles | Private | Private | Private | 144-A | 144-A |
| Measures of Asymmetric Information | (vs. Debt) | (vs. Debt) | Equity | Convertibles | Debt | Convertibles | Debt |
| Analyst Earnings Dispersion | -0.345 [a] | 0.060 | 0.737 [a] | 0.244 [b] | 0.044 | -0.084 | 0.037 |
| | (-3.190) | (.740) | (5.640) | (1.980) | (.920) | (-.690) | (.620) |
| Measures of Risk and Investment Opportunities | | | | | | | |
| Cash Flow Volatility | 1.002 [a] | 0.902 [a] | -0.027 | 0.181 | 0.656 [a] | 0.046 | 0.650 [a] |
| | (4.350) | (3.640) | (-.620) | (.930) | (4.160) | (.240) | (3.630) |
| R&D / Net Fixed Assets | 0.779 [a] | 0.593 [b] | -0.086 | 0.215 | 0.427 [b] | 0.366 [c] | -0.123 |
| | (3.590) | (2.420) | (-1.630) | (1.000) | (2.290) | (1.760) | (-.480) |
| Profitability | -0.950 [a] | -1.028 [a] | -0.541 [a] | -0.352 [b] | -0.449 [a] | -0.134 | -0.468 [a] |
| (Operating Cash Flow) | (-6.580) | (-6.220) | (-7.370) | (-2.020) | (-4.750) | (-.840) | (-3.910) |
| Financial Distress | 0.433 [b] | 0.510 [b] | 0.141 | 0.412 | 0.108 | -0.280 | 0.933 [a] |
| (Z-score <1.81) | (2.390) | (2.260) | (.640) | (1.140) | (.860) | (-.900) | (6.360) |
| Tobin's *q* | 1.262 [a] | 1.103 [a] | 0.228 [a] | 0.324 [a] | 0.688 [a] | 0.162 | 0.484 [a] |
| | (9.320) | (8.100) | (3.820) | (2.620) | (8.330) | (1.570) | (4.250) |
| Corporate Governance | 0.097 [c] | 0.091 | 0.117 | 0.120 | 0.082 [b] | 0.148 | 0.055 |
| | (1.800) | (1.240) | (1.620) | (.950) | (2.190) | (1.420) | (1.080) |
| Log Size | -2.509 [a] | -1.199 [a] | -0.861 [a] | -2.767 [a] | -1.794 [a] | -0.531 [a] | -1.309 [a] |
| (Firm Value) | (-9.040) | (-5.340) | (-6.970) | (-12.110) | (-31.310) | (-3.800) | (-18.800) |
| Debt and Taxes | | | | | | | |
| Debt/Asset Ratio | 0.304 [a] | 0.172 [b] | -0.084 | 0.252 [b] | 0.112 [a] | 0.130 | 0.239 [a] |
| (Industry Adjusted) | (4.770) | (2.180) | (-1.130) | (1.990) | (2.570) | (1.210) | (4.360) |
| Marginal Tax Rate | -0.127 [b] | -0.169 [b] | -0.304 [a] | -0.255 [c] | -0.017 | -0.134 | -0.182 [a] |
| | (-2.140) | (-2.160) | (-3.080) | (-1.720) | (-.420) | (-1.180) | (-3.290) |
| Market Timing & Market Characteristics | | | | | | | |
| Cumulative Abnormal Stock Return | 0.711 [a] | 0.680 [a] | -0.384 [a] | -0.695 [a] | 0.009 | -0.076 | 0.410 [a] |
| (250 prior days) | (7.350) | (6.100) | (-6.290) | (-5.510) | (.120) | (-.880) | (4.520) |
| Cumulative Market Return | 0.085 | -0.004 | -0.052 | -0.110 | -0.022 | 0.040 | -0.124 [b] |
| (Prior year) | (1.330) | (-.050) | (-.710) | (-.760) | (-.450) | (.330) | (-2.020) |
| Aaa Bond Rate | 0.361 [a] | 0.121 | 0.016 | 0.527 [a] | 0.252 [a] | -0.425 [a] | -0.111 [c] |
| | (4.840) | (1.190) | (.180) | (2.980) | (5.250) | (-3.060) | (-1.740) |
| Credit Spread: Baa - Aaa | 0.489 [a] | 0.106 | 0.457 [a] | 0.653 [a] | 0.357 [a] | 0.323 [b] | 0.026 |
| | (5.350) | (.900) | (5.010) | (3.440) | (6.140) | (1.990) | (.340) |
| Constant | 0.763 [c] | -0.289 | -1.895 [a] | -0.551 [a] | 1.855 [a] | 1.210 [a] | -0.014 |
| | (1.680) | (-.690) | (-13.760) | (-2.730) | (20.900) | (8.860) | (-.130) |

a,b,c - Significantly different from zero at the one-percent (five, ten) level of significance.

**Table 9B**
**Choice of Security Issuance in Public and Private Markets**

Table presents coefficient estimates from a nested logit regression testing the impact of asymmetric information and agency cost on public and private security issues by public firms. First stage is the decision of market with coefficients representing tendency relative to the public market. Second stage is the choice of security conditional on market, with coefficients representing tendency versus debt issuance. All firm-specific variables are lagged. Explanatory variables are as defined in Table 2A and they have all been normalized by their standard deviation (except the dummy variable financial distress). (Robust Z-statistics are presented in parentheses.) Chi-squared statistic for test of overall significance is 12372 (p-value .001). Sample is 7681 security issues.

| | First Stage Market Decision | | Second Stage Security Decision | | | | |
|---|---|---|---|---|---|---|---|
| **Explanatory Variables** | Private | 144-A | Public | Public | Private | Private | 144-A |
| Measures of Asymmetric Information | (vs. Public) | (vs. Public) | Equity | Convertibles | Equity | Convertibles | Convertibles |
| Analyst Earnings Dispersion | 0.048 | 0.047 | -0.463 [a] | 0.020 | 0.132 [a] | 0.199 [a] | -0.084 |
| | (1.020) | (.800) | (-3.770) | (.200) | (2.770) | (4.490) | (-.640) |
| Measures of Risk and Investment Opportunities | | | | | | | |
| Cash Flow Volatility | 0.516 [a] | 0.532 [a] | 0.922 [a] | 0.791 [a] | 0.185 [a] | 0.221 [a] | -0.639 [b] |
| | (3.290) | (3.010) | (5.270) | (3.410) | (3.120) | (3.680) | (-2.440) |
| R&D / Net Fixed Assets | 0.308 [c] | -0.183 | 0.732 [a] | 0.463 [c] | 0.188 [b] | 0.180 [c] | 0.506 |
| | (1.690) | (-.740) | (3.550) | (1.720) | (3.130) | (2.720) | (1.370) |
| Profitability | -0.345 [a] | -0.447 [a] | -0.913 [a] | -1.018 [a] | -0.774 [a] | -0.678 [a] | 0.443 [b] |
| (Operating Cash Flow) | (-3.470) | (-3.350) | (-7.400) | (-5.730) | (-10.040) | (-8.420) | (2.140) |
| Financial Distress | 0.074 | 0.890 [a] | 0.408 [b] | 0.521 [c] | 0.383 [b] | 0.601 [a] | -1.243 [a] |
| (Z-score<1.81) | (.600) | (6.010) | (2.250) | (1.850) | (2.180) | (3.250) | (-3.680) |
| Tobin's *q* | 0.609 [a] | 0.486 [a] | 1.264 [a] | 1.029 [a] | 0.615 [a] | 0.505 [a] | -0.390 [b] |
| | (7.190) | (3.590) | (11.930) | (8.110) | (9.980) | (6.990) | (-2.420) |
| Corporate Governance | 0.082 [b] | 0.062 | 0.103 [b] | 0.027 | 0.111 [c] | 0.105 | 0.092 |
| | (2.230) | (1.240) | (1.820) | (.290) | (1.860) | (1.560) | (.810) |
| Log Size | -1.714 [a] | -1.252 [a] | -2.455 [a] | -0.873 [a] | -1.258 [a] | -1.259 [a] | 0.942 [a] |
| (Firm Value) | (-25.630) | (-15.290) | (-23.030) | (-7.210) | (-12.270) | (-11.280) | (6.330) |
| Debt and Taxes | | | | | | | |
| Debt/Asset Ratio | 0.100 [b] | 0.233 [a] | 0.323 [a] | 0.136 | 0.113 [c] | 0.211 [a] | -0.122 |
| (Industry Adjusted) | (2.350) | (4.420) | (5.230) | (1.370) | (1.840) | (3.190) | (-1.050) |
| Marginal Tax Rate | -0.019 | -0.192 [a] | -0.129 [b] | -0.132 | -0.459 [a] | -0.364 [a] | 0.072 |
| | (-.470) | (-3.600) | (-2.050) | (-1.320) | (-5.360) | (-3.940) | (.580) |
| Market Timing & Market Characteristics | | | | | | | |
| Cumulative Abnormal Stock Return | -0.0532 | 0.379 [a] | 0.808 [a] | 0.836 [a] | 0.328 [a] | 0.026 | -0.567 [a] |
| (250 prior days) | (-.680) | (4.220) | (8.210) | (7.130) | (5.570) | (.290) | (-4.180) |
| Cumulative Market Return | -0.023 | -0.115 [c] | 0.111 | -0.018 | 0.040 | -0.054 | 0.160 |
| (Prior year) | (-.500) | (-1.880) | (1.640) | (-.160) | (.650) | (-.750) | (1.200) |
| Aaa Bond Rate | 0.239 [a] | -0.127 [b] | 0.361 [a] | 0.229 [c] | 0.087 | 0.269 [a] | -0.382 [b] |
| | (5.000) | (-2.040) | (4.990) | (1.820) | (1.190) | (3.020) | (-2.550) |
| Credit Spread: Baa - Aaa | 0.346 [a] | 0.034 | 0.464 [a] | 0.016 | 0.471 [a] | 0.152 [c] | 0.234 |
| | (6.130) | (.450) | (5.560) | (.110) | (6.310) | (1.730) | (1.340) |
| Constant | 1.625 [a] | -0.103 | 0.397 [a] | -1.281 [a] | -3.369 [a] | -3.558 [a] | 1.126 [a] |
| | (12.700) | (-.560) | (3.690) | (-8.510) | (-27.890) | (-27.740) | (6.290) |

a,b,c - Significantly different from zero at the one-percent (five, ten) level of significance.

**Table A1**
**Choice of Security Issuance in Public and Private Markets**

Table presents coefficient estimates from a multinomial logit regression testing the impact of asymmetric information and risk on firm public and private security by public firms. Coefficents represent impact on probability relative to public debt issuance. All firm-specific variables are lagged. All market-specific variables represent three months prior to the security issuance. Analyst earnings surprise represents the difference between actual earnings and median analyst forecast per share. Explanatory variables are as defined in Table 2A and they have all been normalized by their standard deviation (except the dummy variable financial distress). (Robust Z-statistics are presented in parentheses.) Chi-squared statistic for test of overall significance is 2135 (p-value .001). Sample is 8470 security issues. Pseudo R-squared is 27.1 percent.

| | Security Issuance Decision | | | | |
|---|---|---|---|---|---|
| **Explanatory Variables** | Public | Private | Public | Private | Private |
| Measures of Asymmetric Information | Equity | Equity | Convertibles | Convertibles | Debt |
| Analyst Earnings Surprise | -0.973 [a] | 0.404 [a] | 0.063 | 0.482 [a] | 0.326 [a] |
| | (-2.660) | (4.610) | (.540) | (5.640) | (4.360) |
| Measures of Risk and Investment Opportunities | | | | | |
| Cash Flow Volatility | 0.540 [a] | 0.533 [a] | 0.414 [b] | 0.579 [a] | 0.202 |
| | (3.040) | (2.890) | (2.150) | (3.150) | (1.410) |
| R&D / Net Fixed Assets | 0.807 [a] | 0.728 [a] | 0.838 [a] | 0.625 [b] | 0.436 [b] |
| | (3.250) | (2.960) | (3.420) | (2.530) | (2.000) |
| Profitability | -0.621 [a] | -1.216 [a] | -0.843 [a] | -1.117 [a] | -0.175 |
| (Operating Cash Flow) | (-4.960) | (-8.870) | (-6.260) | (-8.030) | (-1.630) |
| Financial Distress | -0.061 | -0.121 | -0.159 | -0.045 | -0.406 [a] |
| (Z-score < 1.81) | (-.360) | (-.560) | (-.910) | (-.210) | (-3.450) |
| Tobin's *q* | 0.965 [a] | 1.200 [a] | 0.881 [a] | 1.136 [a] | 0.483 [a] |
| | (8.600) | (9.770) | (7.870) | (9.010) | (5.050) |
| Corporate Governance | 0.046 | 0.197 [a] | 0.102 | 0.135 [c] | 0.047 |
| | (.860) | (2.630) | (1.630) | (1.710) | (1.140) |
| Log Firm Size | -2.072 [a] | -3.132 [a] | -0.768 [a] | -3.209 [a] | -1.599 [a] |
| (firm value) | (-22.470) | (-16.930) | (-9.060) | (-18.390) | (-24.760) |
| Debt and Taxes | | | | | |
| Debt/Asset Ratio | 0.162 [a] | 0.114 | 0.085 | 0.201 [a] | -0.019 |
| (Industry Adjusted) | (2.640) | (1.530) | (1.390) | (2.710) | (-.400) |
| Marginal Tax Rate | -0.058 | -0.450 [a] | -0.167 [b] | -0.352 [a] | 0.039 |
| | (-.950) | (-4.190) | (-2.500) | (-3.390) | (.900) |
| Market Timing & Market Characteristics | | | | | |
| Cumulative Abnormal Stock Return | 0.506 [a] | 0.164 [c] | 0.462 [a] | -0.134 | -0.242 [a] |
| (250 prior days) | (6.750) | (1.860) | (5.920) | (-1.050) | (-3.720) |
| Cumulative Market Return | 0.204 [a] | 0.147 [b] | 0.071 | -0.007 | 0.006 |
| (Prior year) | (3.790) | (2.090) | (1.180) | (-.090) | (.150) |
| Aaa Bond Rate | 0.385 [a] | 0.469 [a] | -0.104 [c] | 0.502 [a] | 0.306 [a] |
| | (7.020) | (6.530) | (-1.760) | (6.430) | (8.300) |
| Credit Spread: Baa - Aaa | 0.425 [a] | 0.875 [a] | 0.201 [a] | 0.497 [a] | 0.355 [a] |
| | (6.440) | (10.990) | (2.900) | (5.650) | (8.030) |
| Constant | 2.880 [b] | -4.720 [a] | -1.340 | -6.000 [a] | 16.950 [a] |
| | (2.880) | (-4.720) | (-1.340) | (-6.000) | (16.950) |

a,b,c - Significantly different from zero at the one-percent (five, ten) level of significance.

**Table A2**
**Choice of Security Issuance in Public and Private Markets**

Table presents coefficient estimates from a multinomial logit regression testing the impact of asymmetric information and risk on firm public and private security by public firms. Coefficents represent impact on probability relative to public debt issuance. All firm-specific variables are lagged. All market-specific variables represent three months prior to the security issuance. Analyst earnings dispersion represents the standard deviation of analyst forecasts divided by price per share. Explanatory variables are as defined in Table 2A and they have all been normalized by their standard deviation (except the dummy variable financial distress). (Robust Z-statistics are presented in parentheses.) Chi-squared statistic for test of overall significance is 1845 (p-value .001). Sample is 7681 security issues. Pseudo R-squared is 24.6%.

| | Security Issuance Decision | | | | |
|---|---|---|---|---|---|
| **Explanatory Variables** | Public | Private | Public | Private | Private |
| Measures of Asymmetric Information | Equity | Equity | Convertibles | Convertibles | Debt |
| Analyst Earnings Dispersion | -0.472 [a] | 0.140 [b] | -0.031 | 0.210 [a] | 0.023 |
| | (-3.130) | (2.010) | (-.440) | (3.850) | (.610) |
| Measures of Risk and Investment Opportunities | | | | | |
| Cash Flow Volatility | 0.560 [a] | 0.530 [a] | 0.417 [b] | 0.576 [a] | 0.249 |
| | (2.910) | (2.650) | (2.020) | (2.900) | (1.560) |
| R&D / Net Fixed Assets | 0.806 [a] | 0.723 [a] | 0.836 [a] | 0.712 [a] | 0.475 [b] |
| | (3.610) | (3.220) | (3.790) | (3.150) | (2.380) |
| Profitability | -0.649 [a] | -1.286 [a] | -0.896 [a] | -1.156 [a] | -0.227 [b] |
| (Operating Cash Flow) | (-5.300) | (-9.100) | (-6.640) | (-7.970) | (-2.160) |
| Financial Distress | -0.113 | 0.034 | -0.162 | 0.258 | -0.361 [a] |
| (Z-score < 1.81) | (-.670) | (.150) | (-.910) | (1.090) | (-2.980) |
| Tobin's *q* | 0.971 [a] | 1.204 [a] | 0.897 [a] | 1.088 [a] | 0.497 [a] |
| | (8.790) | (9.600) | (8.090) | (8.170) | (5.290) |
| Corporate Governance | 0.053 | 0.162 [b] | 0.106 [b] | 0.154 [c] | 0.058 |
| | (.960) | (1.990) | (1.660) | (1.680) | (1.390) |
| Log Firm Size | -2.104 [a] | -3.064 [a] | -0.805 [a] | -3.059 [a] | -1.608 [a] |
| (firm value) | (-21.910) | (-14.280) | (-9.280) | (-15.590) | (-24.260) |
| Debt and Taxes | | | | | |
| Debt/Asset Ratio | 0.188 [a] | 0.108 | 0.112 [c] | 0.206 [b] | 0.002 |
| (Industry Adjusted) | (2.980) | (1.320) | (1.790) | (2.480) | (.040) |
| Marginal Tax Rate | -0.039 | -0.382 [a] | -0.156 [b] | -0.288 [b] | 0.042 |
| | (-.620) | (-3.290) | (-2.290) | (-2.430) | (.970) |
| Market Timing & Market Characteristics | | | | | |
| Cumulative Abnormal Stock Return | 0.552 [a] | 0.145 | 0.502 [a] | -0.181 | -0.240 [a] |
| (250 prior days) | (6.910) | (1.470) | (6.070) | (-1.100) | (-3.500) |
| Cumulative Market Return | 0.135 [b] | 0.082 | 0.047 | -0.021 | 0.012 |
| (Prior year) | (2.390) | (1.020) | (.740) | (-.220) | (.310) |
| Aaa Bond Rate | 0.398 [a] | 0.435 [a] | -0.103 [c] | 0.607 [a] | 0.303 [a] |
| | (6.940) | (5.310) | (-1.700) | (6.530) | (8.090) |
| Credit Spread: Baa - Aaa | 0.407 [a] | 0.844 [a] | 0.206 [a] | 0.521 [a] | 0.354 [a] |
| | (5.980) | (9.730) | (2.900) | (5.270) | (7.890) |
| Constant | 5.080 [b] | -4.720 [a] | -1.010 | -6.620 [a] | 16.880 [a] |
| | (5.080) | (-4.720) | (-1.010) | (-6.620) | (16.880) |

a,b,c - Significantly different from zero at the one-percent (five, ten) level of significance.

**Table A3**
**Choice of Security Issuance in Public and Private Markets**

Table presents coefficient estimates from a nested logit regression testing the impact of asymmetric information and risk on firm public and private security choice by public firms. First stage is the decision of security type with coefficients representing tendency relative to debt. Second stage is the choice of market conditional on security type, with coefficients representing tendency versus public issuance. All firm-specific variables are lagged. Explanatory variables are as defined in Table 2A and they have all been normalized by their standard deviation (except the dummy variable financial distress). Analyst earnings dispersion represents the standard deviation of analyst forecasts divided by price per share. (Robust Z-statistics are presented in parentheses.) Chi-squared statistic for test of overall significance is 10546 (p-value .001). Sample is 7681 security issues.

| | First Stage | | Second Stage: Public versus Private | | |
|---|---|---|---|---|---|
| **Explanatory Variables** | **Security Decision** | | Private | Private | Private |
| Asymmetric Information Measure | Convertibles | Equity | Equity | Convertibles | Debt |
| Analyst Earnings Dispersion | 0.002 | -0.340 [a] | 0.769 [a] | 0.319 [a] | 0.009 |
| | (.040) | (-3.410) | (5.910) | (3.190) | (.240) |
| Measures of Risk and Investment Opportunities | | | | | |
| Cash Flow Volatility | 0.311 [a] | 0.371 [a] | -0.026 | 0.143 | 0.163 [c] |
| | (3.240) | (3.990) | (-.590) | (1.510) | (1.640) |
| R&D / Net Fixed Assets | 0.637 [a] | 0.623 [a] | -0.088 [c] | -0.132 | 0.462 [a] |
| | (4.540) | (4.550) | (-1.650) | (-1.600) | (3.220) |
| Profitability | -0.700 [a] | -0.572 [a] | -0.546 [a] | -0.255 [a] | -0.164 [b] |
| (Operating Cash Flow) | (-8.090) | (-6.740) | (-7.340) | (-2.470) | (-2.180) |
| Financial Distress | -0.040 | -0.049 | 0.133 | 0.642 [b] | -0.378 [a] |
| (Z-score<1.81) | (-.270) | (-.350) | (.590) | (2.280) | (-3.680) |
| Tobin's *q* | 0.783 [a] | 0.863 [a] | 0.225 [a] | 0.190 [b] | 0.484 [a] |
| | (8.610) | (9.290) | (3.680) | (2.180) | (7.050) |
| Corporate Governance | 0.112 [a] | 0.051 | 0.122 [c] | -0.013 | 0.060 [c] |
| | (2.490) | (1.210) | (1.650) | (-.130) | (1.840) |
| Log Size | -0.612 [a] | -1.563 [a] | -0.838 [a] | -2.324 [a] | -1.370 [a] |
| (Firm Value) | (-3.750) | (-7.700) | (-6.710) | (-11.910) | (-30.510) |
| Debt and Taxes | | | | | |
| Debt/Asset Ratio | 0.107 [b] | 0.170 [a] | -0.091 [b] | 0.156 | -0.001 |
| (Industry Adjusted) | (2.350) | (3.920) | (-1.200) | (1.620) | (-.030) |
| Marginal Tax Rate | -0.185 [a] | -0.073 | -0.289 [a] | -0.139 | 0.043 |
| | (-3.560) | (-1.510) | (-2.900) | (-1.120) | (1.220) |
| Market Timing & Market Characteristics | | | | | |
| Cumulative Abnormal Stock Return | 0.418 [a] | 0.503 [a] | -0.388 [a] | -0.609 [a] | -0.200 [a] |
| (250 prior days) | (6.830) | (8.350) | (-6.240) | (-5.630) | (-3.550) |
| Cumulative Market Return | 0.050 | 0.123 [a] | -0.046 | -0.171 | 0.019 |
| (Prior year) | (.980) | (2.580) | (-.630) | (-1.530) | (.460) |
| Aaa Bond Rate | -0.082 | 0.324 [a] | 0.010 | 0.913 [a] | 0.301 [a] |
| | (-1.260) | (4.540) | (.110) | (6.840) | (7.270) |
| Credit Spread: Baa - Aaa | 0.160 [b] | 0.385 [a] | 0.452 [b] | 0.398 [a] | 0.357 [a] |
| | (2.030) | (4.950) | (4.870) | (2.960) | (7.330) |
| Constant | -1.007 [a] | -0.862 [a] | -1.874 [a] | -2.093 [a] | 0.960 [a] |
| | (-3.310) | (-2.820) | (-13.530) | (-12.090) | (15.970) |

a,b,c - Significantly different from zero at the one-percent (five, ten) level of significance.

**Table A4**
**Choice of Security Issuance in Public and Private Markets**

Table presents coefficient estimates from a nested logit regression testing the impact of asymmetric information and risk on firm public and private security choice by public firms. First stage is the decision of market with coefficients representing tendency relative to the public market. Second stage is the choice of security conditional on market, with coefficients representing tendency versus debt issuance. All firm-specific variables are lagged. Explanatory variables are as defined in Table 2A and they have all been normalized by their standard deviation (except the dummy variable financial distress). Analyst earnings dispersion represents the standard deviation of analyst forecasts divided by price per share. (Robust Z-statistics are presented in parentheses.) Chi-squared statistic for test of overall significance is 10533 (p-value .001). Sample is 7681 security issues.

| | First Stage Market Decision | Second Stage Security Decision | | | |
|---|---|---|---|---|---|
| **Explanatory Variables** | Private | Public | Public | Private | Private |
| Asymmetric Information Measure | (vs. Public) | Equity | Convertibles | Equity | Convertibles |
| Analyst Earnings Dispersion | 0.040 | -0.461 [a] | -0.032 | 0.127 [a] | 0.197 [a] |
| | (1.030) | (-4.040) | (-.490) | (2.600) | (4.330) |
| Measures of Risk and Investment Opportunities | | | | | |
| Cash Flow Volatility | 0.117 | 0.452 [a] | 0.345 [a] | 0.206 [a] | 0.242 [a] |
| | (1.280) | (4.100) | (2.960) | (3.160) | (3.660) |
| R&D / Net Fixed Assets | 0.256 [c] | 0.726 [a] | 0.755 [a] | 0.215 [a] | 0.206 [a] |
| | (1.790) | (4.750) | (4.890) | (3.300) | (2.950) |
| Profitability | -0.077 | -0.547 [a] | -0.748 [a] | -0.842 [a] | -0.738 [a] |
| (Operating Cash Flow) | (-.960) | (-5.680) | (-7.490) | (-10.300) | (-8.720) |
| Financial Distress | -0.358 [a] | -0.156 | -0.183 | 0.385 [b] | 0.610 [a] |
| (Z-score<1.81) | (-3.730) | (-.990) | (-1.160) | (2.120) | (3.230) |
| Tobin's q | 0.351 [a] | 0.957 [a] | 0.877 [a] | 0.622 [a] | 0.515 [a] |
| | (4.390) | (11.930) | (11.070) | (9.460) | (6.920) |
| Corporate Governance | 0.054 [c] | 0.066 | 0.114 [b] | 0.101 | 0.094 |
| | (1.770) | (1.330) | (2.220) | (1.620) | (1.370) |
| Log Size | -1.258 [a] | -1.881 [a] | -0.719 [a] | -1.195 [a] | -1.199 [a] |
| (Firm Value) | (-19.430) | (-23.370) | (-10.840) | (-11.150) | (-10.500) |
| Debt and Taxes | | | | | |
| Debt/Asset Ratio | -0.004 | 0.191 [a] | 0.111 [b] | 0.094 | 0.189 [a] |
| (Industry Adjusted) | (-.110) | (3.720) | (2.120) | (1.480) | (2.800) |
| Marginal Tax Rate | 0.043 | -0.045 | -0.157 [a] | -0.428 [a] | -0.335 [a] |
| | (1.310) | (-.810) | (-2.740) | (-4.880) | (-3.570) |
| Market Timing & Market Characteristics | | | | | |
| Cumulative Abnormal Stock Return | -0.275 [a] | 0.528 [a] | 0.486 [a] | 0.315 [a] | 0.031 |
| (250 prior days) | (-4.610) | (8.080) | (7.160) | (4.860) | (.350) |
| Cumulative Market Return | -0.005 | 0.129 [b] | 0.043 | 0.058 [b] | -0.038 |
| (Prior year) | (-.130) | (2.220) | (.720) | (.890) | (-.520) |
| Aaa Bond Rate | 0.285 [a] | 0.420 [a] | -0.102 | 0.122 | 0.296 [a] |
| | (7.180) | (6.550) | (-1.600) | (1.610) | (3.270) |
| Credit Spread: Baa - Aaa | 0.331 [a] | 0.453 [a] | 0.220 [a] | 0.483 [a] | 0.159 [c] |
| | (7.140) | (6.250) | (2.950) | (6.220) | (1.760) |
| Constant | 0.693 [a] | -0.550 [a] | -0.720 [a] | -3.360 [a] | -3.540 [a] |
| | (5.320) | (-7.030) | (-9.230) | (-27.450) | (-27.360) |

a,b,c - Significantly different from zero at the one-percent (five, ten) level of significance.

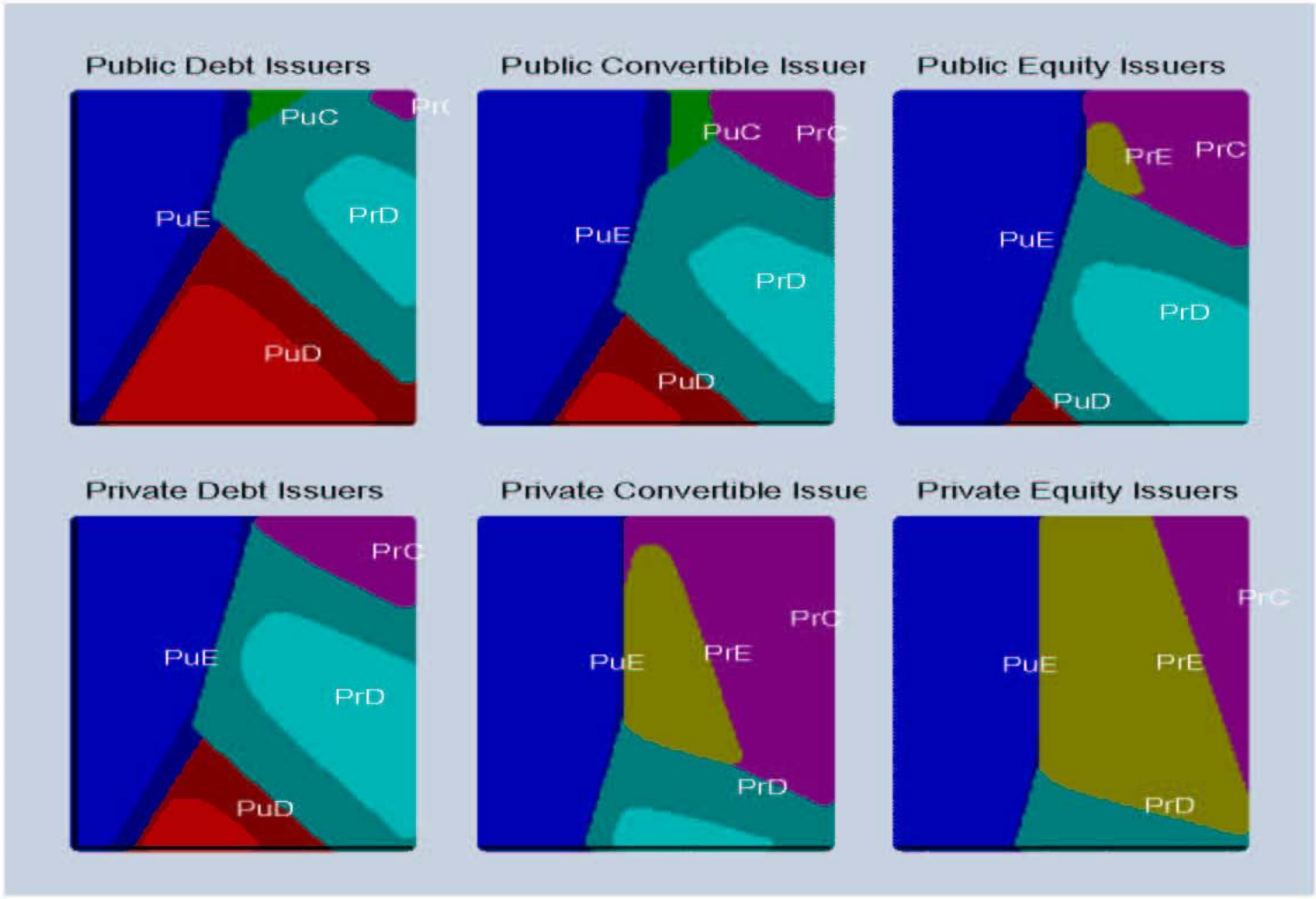


**Figure 1. Predicted Security-Market Choices.** The figure shows the predicted probability of security issuance using the coefficient estimate from 6 choice model in Table 4 for each of the six different security choices. Risk (volatility of cash flows) is on the y-axis and asymmetric information (earnings surprise relative to analyst forecasts) is on the x-axis. We hold all data at security means and then vary risk and asymmetric information proxies from +/- 10 standard deviations away from the mean value for each security type. PuE (PrE) is public (private) equity, PuC (PrC) is public (private) convertibles, PuD (PrD) is public (private) Debt. Dark and light shading within regions represents predicted probability of that security greater than 50% and 0-50% higher than the next highest security.

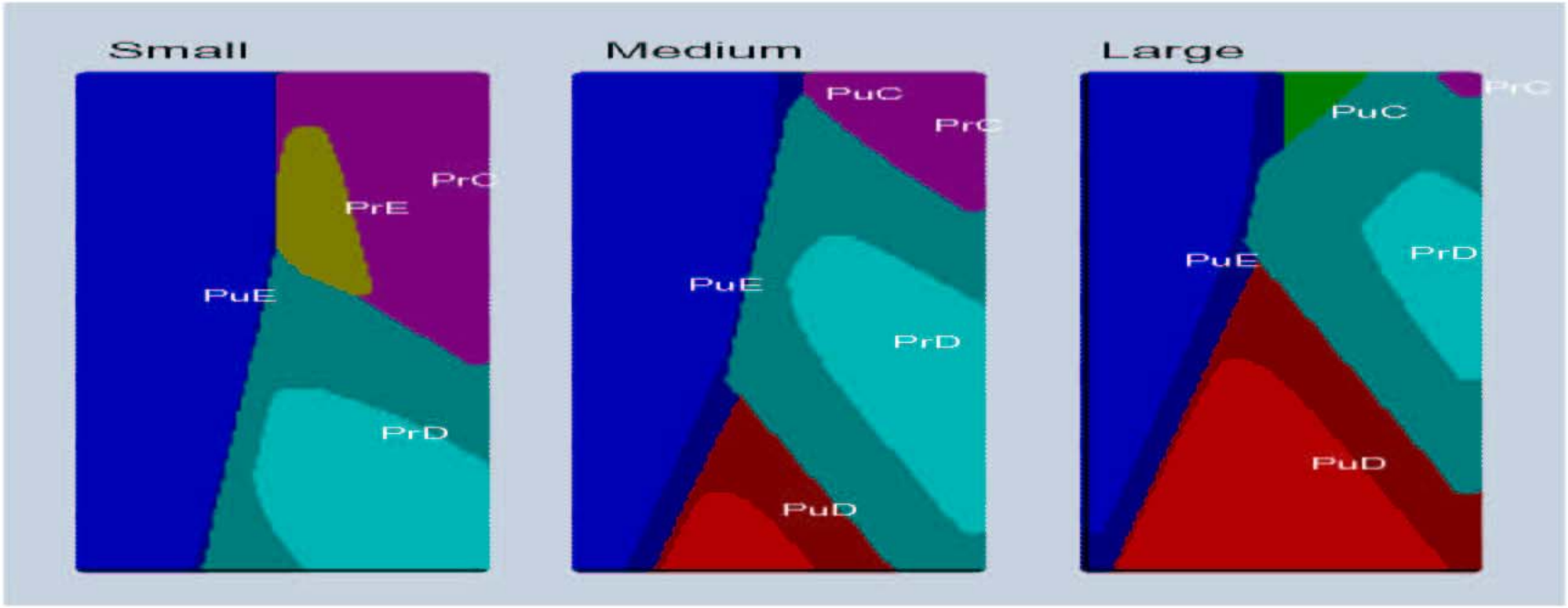


**Figure 2. Predicted Security-Market Choices by Size Groups.** The figure shows the predicted probability of security issuance using the coefficient estimate from 6 choice model in Table 4 for each of three size groups: small-below 33rd percentile- medium-between 33rd and 66th -percentile- and large-above 66th percentile. Risk (volatility of cash flows) is on the y-axis and asymmetric information (earnings surprise relative to analyst forecasts) is on the x-axis. We hold all data at security means and then vary risk and asymmetric information proxies from +/- 10 standard deviations away from the mean value for each security type. PuE (PrE) is public (private) equity, PuC (PrC) is public (private) convertibles, PuD (PrD) is public (private) Debt. Dark and light shading within regions represents predicted probability of that security greater than 50% and 0-50% higher than the next highest security.