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Timing, investment opportunities, managerial discretion, and the security issue decision

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Abstract

This paper investigates the ability of the pecking-order model, the agency model, and the timing model to explain firms' decisions whether to issue debt or equity, the stock price reaction to their decisions, and their actions afterward. We find strong support for the agency model. Firms often depart from the pecking order because of agency considerations. We fail to find support for the timing model.

Key words: Security issue; Managerial discretion; Equity; Debt; Investment opportunities
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1. Introduction

Why is it that some firms raise new funds by issuing equity and others issue debt? There are three important explanations for this choice in the literature:

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(1) the pecking-order model, (2) the agency model, and (3) the timing model. The pecking-order model is based on the view that information asymmetries between new investors and managers who maximize the wealth of existing shareholders make equity issues more costly than debt issues and therefore imply a financing hierarchy.¹ Firms therefore prefer issuing debt to issuing equity, and experience a negative stock price reaction if forced to issue equity. The agency model relies on the argument that managers sometimes pursue their own objectives, such as firm growth, at the expense of shareholders. If management pursues growth objectives, equity issues are valuable for shareholders when undertaken by firms that have good investment opportunities, but not otherwise. The timing model has evolved from the striking finding of Loughran and Ritter (1995) and Spiess and Affleck-Graves (1995) that firms experience long-term underperformance after they issue equity. As argued by Stein (1995), if equity is overpriced and the market underreacts to equity issues, then management maximizes the wealth of existing shareholders by issuing equity.

A theory of the corporate security issue choice should explain (1) why firms choose to issue a particular security, (2) how the market reacts to that choice, and (3) the actions of the firm after the issue. The pecking-order model is well-articulated and addresses each one of these questions. The agency model is much better developed as an explanation of the cross-sectional variation in capital structures (see Harris and Raviv, 1991; Smith and Watts, 1992) than as a model of security issue choice. The timing model addresses the three questions, but it relies on the assumption that the market fails to incorporate all the information communicated by a security issue. In this paper, we develop a unified analysis of the implications of the agency model to address the three questions that have to be answered to provide a satisfactory model of security issue choice. We then proceed to investigate how well the pecking-order model, the agency model, and the timing model explain the data.

Our results strongly support the agency model. We find that firms issuing equity are of two types: (i) firms with valuable investment opportunities that seek financing to grow profitably and (ii) firms that do not have valuable investment opportunities and have debt capacity. Without agency costs of managerial discretion, one would not expect the latter firms to issue equity. The agency model predicts that equity issues by such firms are bad news for shareholders, since they enhance managerial discretion when managers' objectives differ from shareholders' objectives. We find that, controlling for other firm and issue characteristics, firms without valuable investment opportunities have a more negative stock price reaction to equity issues than firms with better

¹See Myers (1984). Information asymmetries between management and outside investors do not necessarily imply a financing hierarchy. Examples of models which emphasize informational asymmetries but do not obtain a pecking-order result are Brennan and Kraus (1987) and Noe (1988).

investment opportunities. We provide other evidence supporting the view that some firms issue equity to benefit management rather than shareholders. In particular, we show that firms without valuable investment opportunities issuing equity invest more than similar firms issuing debt, that firms with low managerial ownership have worse stock price reactions, and that the worst stock price reactions occur for firms without valuable investment opportunities issuing equity to finance capital expenditures.

Even though firms issuing equity perform more poorly than firms issuing debt on average, our cross-sectional regressions show that the subsequent evolution of the stock price does not explain the firms' security issue choice. The reason for this is that the cross-sectional standard deviation of post-issue cumulative abnormal performance is extremely large, so that extremely large samples are required to obtain statistically significant results. One interpretation of this result is that our sample of 192 primary equity issues and 276 bond issues is too small to obtain a powerful test of the timing model. Alternatively, one might argue that there is too much variation in long-term performance following equity issues for it to be an important determinant of management's decision. We provide evidence that the second interpretation should be taken seriously using a sample that is similar in size to the samples used in long-term performance studies.

We proceed as follows. In Section 2, we provide a more detailed analysis of the agency argument and its implications for the interpretation of the stock price reaction to equity issues. In Section 3, we introduce our sample and discuss the characteristics of firms issuing debt and equity. Section 4 provides estimates of an issue choice model. In Section 5, we investigate how the stock price reaction relates to firm characteristics. Section 6 shows that debt- and equity-issuing firms have distinct investment patterns following the new issue. Concluding remarks are presented in Section 7.

2. Models of the security issue decision

In this section, we analyze the role of agency costs in the security issue decision and compare the predictions of the agency cost model to the predictions of other models in the literature. To understand the role of agency costs in the security issue decision, it is best to investigate a special case of Myers and Majluf (1984). In their model, management has better information than investors about assets in place and about the firm's investment opportunities. If management can issue securities at a higher price than they are truly worth given its information, it chooses to do so to maximize the wealth of the existing shareholders. Riskless debt cannot be sold for more than it is worth, but risky debt and equity can. When the firm announces issues of risky securities, therefore, outsiders adjust their valuation of the firm to reflect the new information. This

adjustment is trivial if the securities issued are not very sensitive to firm value, but is significant in the case of equity. The valuation impact of equity issues increases their cost and induces firms to issue equity only as a way of raising funds when debt financing would be extremely costly because the firm has exhausted its ability to sell low-risk debt. For these results to hold, though, it is crucial for outsiders to be less well-informed than management about the components of firm value.

Suppose now that outsiders know the value of assets in place in the Myers and Majluf model. Then, as recognized by Myers and Majluf, the model collapses: the firm always invests if it has a positive NPV project and, in their set-up, always issues equity to finance it. With agency costs, this special case remains interesting. To see why, consider an all-equity firm that is highly unlikely to have profitable investment opportunities. If the management of that firm always maximizes shareholder wealth, an equity issue undertaken to fund a project is good news. It means that the firm has unexpectedly obtained a positive NPV investment project. In the presence of agency costs of managerial discretion, however, an equity issue that enables management to invest is not necessarily good news and can be bad news altogether. A management investing in negative NPV projects would rather finance that investment with equity; debt financing for a negative NPV project eventually reduces resources under management's control since the present value of the debt payouts exceeds the present value of the project's payoffs.

Jensen (1986) and Stulz (1990) show that leverage limits management's discretion and hence reduces the agency costs of managerial discretion. First, management has less control over the firm's cash flows since these cash flows have to be used to repay creditors. Second, management is monitored by creditors who want to make sure that they will be repaid. However, leverage also has adverse effects on firm value. A firm with good projects but high leverage is less able to take full advantage of these projects. For instance, the impact on investment of an adverse liquidity shock increases with the amount of leverage. Consequently, firms with good projects want to limit their leverage and, if levered, are more likely to choose equity financing. Bernanke, Gertler, and Gilchrist (1993) review the literature on the relation between liquidity shocks and investment, and Lang, Ofek, and Stulz (1996) show that investment is negatively related to leverage for low- q firms. The agency costs that arise because a levered firm may be unable to pursue the investment policy that would maximize the value of an all-equity firm are called here the agency costs of debt (see Jensen and Meckling, 1976; Myers, 1977). Smith and Watts (1992) provide extensive cross-sectional evidence of such agency costs, showing a negative relation between investment opportunities and leverage, and Titman and Wessels (1988) document a negative relation between R&D and leverage.

In Fig. 1, we show the optimal amount of leverage for given investment opportunities. The optimal amount of leverage is the amount at which the

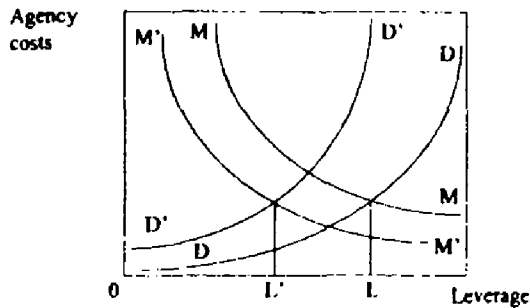


Fig. 1. Optimal leverage and agency costs of debt and managerial discretion.

This figure shows optimal leverage as a function of the marginal agency costs of debt (DD) and the marginal agency costs of managerial discretion (MM) for a given investment opportunity set. An improvement in investment opportunities shifts the marginal agency costs of debt curve to DD and the marginal agency costs of managerial discretion curve to MM , so that optimal leverage falls from L to L' .

marginal agency costs of debt equal the marginal agency costs of managerial discretion. Based on our previous discussion, the marginal agency costs of debt should increase with leverage and the marginal agency costs of managerial discretion should fall with leverage. We show how a shift in investment opportunities leads to a decrease in the optimal amount of leverage: for each level of leverage, an increase in investment opportunities (1) increases the marginal agency costs of debt because the firm has more to lose from financial distress and (2) decreases the marginal agency costs of managerial discretion because the objectives of management and shareholders become more congruent when investment opportunities become better.

Since equity provides unrestricted funds, why is it that management ever chooses to issue debt? Issuing equity has both direct and indirect consequences for management. The direct effect is an increase in managerial discretion, which management values. However, the indirect effect can be quite adverse for management depending on the firm's situation. If the firm does not have valuable investment opportunities, an equity issue means that the agency costs of managerial discretion increase, providing greater incentives for outsiders to try to affect management's actions. In particular, control activities, such as takeovers, active monitoring by large shareholders, monitoring by board members, and proxy fights, all become more advantageous for shareholders and outside investors. Issuing equity inappropriately can therefore increase the probability that management will lose control through corporate control actions unless it is well protected from such actions. Zwiebel (1994) presents a model in which management issues debt because of a threat from the market for corporate control. Hoshi, Kashyap, and Scharfstein (1993) have a related model in which the better firms choose financing with low monitoring,

intermediate-quality firms choose financing with high monitoring, and the worst firms choose financing with low monitoring. (In their paper, financing with low monitoring is public debt and financing with high monitoring is bank financing; here, financing with low monitoring is equity and financing with high monitoring is public debt.) In addition, equity financing reduces the fraction of votes controlled by management and its allies unless they increase their investment in the firm (see Stulz, 1988). Consequently, equity financing both increases the benefits from outside intervention and makes outside intervention easier.

Taking into account the agency costs of managerial discretion makes the information content of new security issues more complicated. To understand this information content, it is best to focus on the cross-sectional relation between stock price reactions and a firm's investment opportunities, since the agency costs of managerial discretion are inversely related to the quality of the firm's investment opportunities. If there is no uncertainty about the value of a firm's investment opportunities, the issuing decision is straightforward in the pecking-order model. If a firm has sufficiently good investment opportunities, it issues equity if it cannot issue debt and the issue is not very informative about the value of assets in place. In contrast, if the firm has no valuable investment opportunities, it never issues equity. For firms with sufficiently good investment opportunities, the interests of management and shareholders should coincide so that they will follow the pecking-order model. Firms that can finance with low-risk debt do so; otherwise they either issue equity or do not invest at all if equity is too underpriced. For firms that have no valuable investment opportunities, however, there are good reasons to expect departures from the pecking-order model if management pursues objectives of its own. In particular, management may issue equity to keep the firm growing even though the firm has no positive NPV investment opportunities. For such firms, an equity issue reveals to outsiders that management has to raise funds to finance its plans, that it has decided to proceed with poor investments, and, finally, that it views the risks to its position from doing all this to be worth taking. If the equity issues are equally unanticipated, the news for outsiders is worse for the firm with no valuable investment opportunities.

At this point, it is useful to summarize the view that agency costs matter for security issues by showing how these costs affect the firm's decision regarding which security to issue (the issue decision), how stock price reactions are consistent with the existence of such costs (the information content), and how the firm's behavior after the issue is affected by these costs (the ex post actions). If the threat of outside intervention is held constant, agency considerations imply that managers favor equity over debt, so that firms for which the agency costs of managerial discretion are important issue equity even though shareholders would be better off with a debt issue or no issue at all. However, an

equity issue that is not in the interests of shareholders will have a negative impact on shareholder wealth to the extent that it is not anticipated, because the funds are likely to be invested poorly and because management is not as constrained by monitoring from outside investors as was expected. Finally, whether they have good investment opportunities or not, the firms that issue equity do so to have the flexibility to grow and should therefore grow more than debt-issuing firms. This should be true even for firms that have debt capacity but no valuable investment opportunities, since in these firms management chooses to issue equity to have more freedom to invest in poor projects.

It is important to note that the implications of agency costs do not make the considerations emphasized in the pecking-order model irrelevant. Irrespective of the importance of the agency costs of managerial discretion, there will always be some level of undervaluation of the existing shares at which management chooses not to issue. For firms whose agency costs of managerial discretion are small enough, it may be that the pecking-order model applies exactly. The pecking-order model based on information asymmetries assumes that management maximizes shareholder wealth whereas the agency cost view assumes that management pursues objectives of its own. As emphasized by Dybvig and Zender (1991) and others, the pecking-order model makes an ad hoc assumption about management's objectives that would not be appropriate if shareholders could choose a compensation policy for management such that the ex ante value of the firm is maximized. Since both the pecking-order model and the agency model rely on ad hoc assumptions about managerial objectives, only empirical evidence can allow us to evaluate the economic relevance of each model for the security issue decision.

Models with information asymmetries that assume away the agency costs of managerial discretion are most successful at explaining the negative stock price reaction to equity issues. As modified by Cooney and Kalay (1993), the Myers and Majluf model can explain that high-growth firms issuing equity would have a more positive stock price reaction than low-growth firms. Hence, relating the stock price reaction to investment opportunities is not sufficient to make the case for the agency model of security issues. This is why it is also important to consider the choice decision and the post-issue actions of the firm.

With the timing model, managers issue equity when they know that it is overvalued. Since the market underreacts to equity issues, firms issuing equity perform poorly in the long run as the market corrects the overvaluation that exists at the time of issue. A market underreaction to equity issues could play a role both in the agency model and in the pecking-order model. The question we therefore want to address is whether timing is a first-order consideration in the security issue choice decision. Importantly, none of the models explain the long-run post-issue abnormal returns.

3. The sample

To obtain our sample of new bond issues and primary stock offerings, we use the Registered Offerings Statistics File from 1977 to 1984. For the stock offerings, we use the Corporate Financing Directory published by the Investment Dealer's Digest to exclude all issues that involve secondary stock offerings and all shelf offerings. We restrict the sample to firms whose stock returns are available on the Center for Research in Security Prices (CRSP) tape for the whole calendar year before the announcement date. The announcement dates come from the Wall Street Journal Index. We use as our event date the first mention of a security issue before the offering date and exclude security issues for which such announcements are not available. We exclude utilities and banking firms to conform to the earlier literature. We also eliminate firms that have confounding announcements, such as dividend or earnings announcements.

We compute abnormal returns using a method similar to the one used by Asquith and Mullins (1986). For each calendar year in the sample we rank securities in the CRSP daily file according to their beta estimated using the market model. We then divide the securities into ten portfolios based on estimated betas. For each firm issuing a security, we compute the abnormal return over a two-day period that includes the day of the Wall Street Journal announcement and the day preceding the announcement. The abnormal return is defined to be the return of the issuing firm minus the return of the portfolio to which the firm belongs, although all of our results hold if we compute abnormal returns as market model residuals.

Table 1 provides a summary of the abnormal return data for the stock and bond issues. The results are similar to those reported in earlier papers in that equity announcements have a significant negative stock price reaction and debt announcements have an insignificant stock price reaction.² Table 1 also reports various characteristics of firms issuing debt and equity. The median debt-issuing firm has a stock market capitalization about four times larger than the median equity-issuing firm and raises about four times more funds through the issue. The equity-issuing firms are riskier than the debt-issuing firms in that they have both a higher beta and greater stock return volatility. The leverage measure that uses the market value of common stock in the denominator does not differ between firms issuing debt and those issuing stock, whereas the leverage

²For instance, Mikkelsen and Partch (1986) find an average abnormal return for stock issues of -3.56% and straight debt of -0.23% . Eckbo (1986) finds a similar result for debt issues. Asquith and Mullins (1986) find an abnormal return for primary stock issues for industrial firms of -3.0% whereas Masulis and Korwar (1986) find a stock price reaction of -3.25% . Barclay and Litzenberger (1988) find an abnormal return of -2.44% for the three hours surrounding the announcement on the Broad Tape.

Table 1

Abnormal returns and firm characteristics for 192 equity and 276 bond issues from 1977 to 1984

The abnormal returns are computed for the day of the WSJ announcement and the previous day. Amount equals the gross proceeds of the issue in millions of dollars. LTD is the book value of the firm's long-term debt. Cash flow is operating income before depreciation minus total taxes adjusted for changes in deferred taxes, minus gross interest expense and minus dividends paid on common and preferred stock, divided by total assets (TA). Market-to-book is the ratio of firm market value (market value of equity plus TA minus book value of equity) to TA. All accounting data are for the end of the fiscal year before the issue. The leading indicators are the six-month leading indicators. The volatility of the firm's stock return and the firm's beta are obtained using the CRSP daily data file for the period $t - 240, \dots, t - 40$. Difference is the mean of a variable for stock issues minus the mean of the same variable for bond issues; the p -value is for the null hypothesis that the difference is zero assuming unequal variances for the two subsamples.

	Stock issues		Bond issues		Difference
	Mean	Median	Mean	Median	
<i>Abnormal return</i>	-2.70%	-2.63%	-0.09%	-0.15%	-2.62*
<i>Amount</i>	47.98	28.25	140.00	100.00	-92.01*
<i>Market value of equity (MVCS)</i>	682.74	186.02	2941.70	883.62	2258.97*
<i>Proceeds/MVCS</i>	0.15	0.13	0.24	0.13	-0.09*
<i>Dividend yield</i>	2.06	1.43	3.96	3.69	-1.90*
<i>LTD/MVCS</i>	0.65	0.42	0.72	0.41	-0.07
<i>LTD/TA</i>	0.29	0.28	0.23	0.21	0.06*
<i>Cash flow</i>	0.09	0.09	0.10	0.09	-0.01
<i>Cash + Liquid assets/TA</i>	0.06	0.04	0.06	0.04	0.00
<i>Market-to-book</i>	1.48	1.25	1.13	1.02	0.35*
<i>Leading indicators</i>	0.03	0.03	0.00	0.00	0.03*
<i>11-month prior cumulative excess return</i>	13.95%	15.07%	1.63%	3.26%	15.58*
<i>Beta</i>	1.39	1.35	1.15	1.06	0.24*
<i>Volatility</i>	7.27%	6.28%	4.67%	3.20%	2.60*
<i>3-year raw returns</i>	59.47%	37.86%	76.20%	52.49%	16.73
<i>5-year raw returns</i>	98.88%	57.12%	146.75%	98.56%	47.87**
<i>Size-matched 3-year cumulative returns</i>	-7.89%	-13.90%	5.16%	-3.64%	2.75
<i>Size-matched 5-year cumulative returns</i>	-32.69%	-46.81%	2.03%	-18.60%	34.72

* (**) denotes significance at the 0.01 (0.05) level.

measure that uses the book value of total assets in the denominator is higher for firms that issue equity. Therefore, book leverage is more supportive of the pecking-order story than a market measure of leverage.

The pecking-order model predicts that firms are more likely to issue equity when the stock price experiences positive abnormal returns before the issue. Measuring the cumulative excess return of the issuing firm's common stock as in

Asquith and Mullins (1986), we find that firms that issue common stock have experienced significant positive abnormal returns for the 11 months before the stock issue, whereas firms that issue bonds experience insignificant negative cumulative abnormal returns on average. Mikkelson and Partch (1986) obtain a similar result on a smaller sample of bond offerings. The result for debt is inconsistent with the conjecture of Lucas and McDonald (1990) that firms issuing risky debt should have positive cumulative abnormal returns on average if debt is viewed as equity with less risk. The firms issuing equity and those issuing debt have similar cash flows before the issue. We also investigate, but do not report here, earnings to total assets, earnings before interest and taxes (*EBIT*) to total assets, and net operating income to total assets. In all cases, the mean for equity-issuing firms is larger, but the difference in means is significant only for net operating income. Finally, the firms issuing debt have a substantially higher dividend yield than the firms issuing equity.

Using the ratio of firm market value (defined as the market value of equity plus the book value of total assets minus the book value of equity) to the book value of assets (market-to-book) as a proxy for investment opportunities as in Smith and Watts (1992), firms issuing equity have better investment opportunities than firms issuing debt at the time of the announcement. In addition, firms issuing equity (but not those issuing debt) are more likely to do so when the leading indicators suggest good economic conditions and therefore good investment opportunities; Choe, Masulis, and Nanda (1993) observe the same result. Finally, the cumulative abnormal returns before the issue (discussed in the previous paragraph) are consistent with an improvement in the investment opportunities of firms issuing equity before the issue.

The timing model relies on the observation that equity-issuing firms perform poorly following the issue. Since this long-term performance is poor on average, it is consistent with the view that firms time their issues to coincide with periods when their equity is overvalued. Cheng (1994) provides further support for this view by showing that debt-issuing firms do not have poor long-term abnormal returns and that firms issuing equity that do not invest the proceeds have the worst abnormal returns. In Table 1, we provide evidence on the long-term performance of the firms in our sample. The cumulative returns are buy-and-hold returns. We show both raw returns and excess returns obtained by subtracting from the return of the issuing firm the return of a matching firm of similar size that has not issued equity in previous sample years. We also compute net-of-market returns but do not report them here since they lead to the same conclusions as the results we report. Our procedures are the same as the ones used by Loughran and Ritter (1995).

The raw returns are significantly positive both for bond- and equity-issuing firms. The difference between the raw returns of bond-issuing firms and equity-issuing firms is significant at the five-year horizon with a *t*-statistic of 2.06, but is not significant at the three-year horizon. The substantial worsening of the

performance of equity-issuing firms over the last two years of the five-year horizon is surprising. Turning to excess returns, we find that equity-issuing firms have significant negative excess returns on a five-year horizon at the 0.10 level. The excess returns are negative but not significant at the three-year horizon. Irrespective of the horizon, though, the mean excess return is large in absolute value for equity-issuing firms and consistent with previous evidence on the underperformance of equity-issuing firms. Bond-issuing firms have positive, although not significant, average excess returns at the five-year horizon. Using nonparametric statistics (rank and sign tests), excess returns are significantly negative for equity-issuing firms but not for debt-issuing firms. There is no significant difference in the means of excess returns between bond- and equity-issuing firms, but the medians are significantly different. That such large differences in means are not significant is consistent with the view articulated in Kothari and Warner (1995) that long-term returns have considerable cross-sectional variation so that statistical tests using such returns have low power. The limited significance of our results using long-term returns is no doubt partly explained by the fact that the number of equity issues used here is less than one-tenth of the number used in Loughran and Ritter (1995). In addition, however, our sample contains larger and more established firms since it only has Compustat firms. Brav, Géczy, and Gompers (1994) argue that underperformance is more pronounced for small issuing firms.

4. An empirical analysis of the security issue choice

In this section, we investigate an empirical model of security issue choice for our sample firms. This model uses standard variables from the literature to predict the security issue choice plus a proxy for investment opportunities and measures of long-term post-issue abnormal returns. Since the agency costs of debt are higher for firms with better investment opportunities, one expects the probability that a firm will issue equity to increase with investment opportunities if management maximizes shareholder wealth. Firms with high agency costs of managerial discretion will issue equity when they have poor investment opportunities, but such firms are expected to be a subset of the sample so that in a logistic regression model they will be firms that are not expected to issue equity and hence issue against type. If our proxy for investment opportunities simply proxies for firm overvaluation, as partisans of the timing model might argue, then inclusion of long-term abnormal returns should account for overvaluation. Further, if the timing model plays an important role in the issuing firm's decision, long-term cumulative excess returns should significantly affect the firm's issuing decision because the timing model relies on the argument that management knows when future performance will be poor and issues accordingly. Using actual long-term returns as a proxy for management's expectations

of long-term returns amounts to assuming that management has perfect foresight.

The literature on the determinants of firms' capital structures is extensive, but some variables are pervasive in the existing empirical work. Masulis (1988) and Harris and Raviv (1991) contain references to empirical studies that use these variables as well as references to theoretical papers that motivate their use. In this paper, we focus on a small number of determinants of leverage that are commonly considered by empiricists and reflect certain key ideas:

1. *Taxation.* Because of the deductibility of interest payments, a number of papers argue that the gain from debt financing relative to equity financing increases with the firm's tax rate. The literature has shown that the firm's tax status affects the issue decision (see MacKie-Mason, 1990). As a proxy for these benefits, we use tax payments divided by the book value of total assets for the year preceding the issue.

2. *Costs of financial distress.* As debt and firm risk increase, financial distress and bankruptcy become more likely. As a risk proxy, we use stock return volatility measured over the 200 days preceding the issue. Profitability is measured as cash flow divided by total assets, and leverage is measured as long-term debt divided by total assets. We use other proxies for risk (beta instead of volatility), profitability (earnings measures), and leverage (market value of equity instead of total assets) but do not report the results because our conclusions are insensitive to the choice of proxies for bankruptcy risks and costs.

3. *Asymmetric information.* Following Myers and Majluf (1984), it is well-established that issuing equity is more expensive when there is asymmetric information between firm insiders and outsiders. Therefore, firms for which this information asymmetry is large should issue debt if they can or abstain from raising funds altogether. As emphasized by Korajczyk, Lucas, and McDonald (1991), firms should time equity issues for periods when the information asymmetry is smaller. Following Lucas and McDonald (1990), firms are more likely to have good projects and hence raise funds if their returns before the issue are high (measured here by net-of-market returns over the 200 days before the issue) and leading indicators of economic activity are favorable. Firms that issue when they have slack are also more likely to do so because of low information asymmetries. We measure slack by cash and liquid assets normalized by total assets.

In some of our regressions, we also control for the amount raised through the security issue since net proceeds have been found to affect the stock price reaction in some studies. Presumably, the amount raised by the firm and the type of security issued are jointly endogenous variables. This suggests that logistic regressions that do not include the amount raised as an explanatory variable have the interpretation of reduced-form equations, whereas equations that include the amount raised suffer from a simultaneous equation bias. A more

important reason to consider regressions without the amount raised as an explanatory variable is that such regressions can be used by investors to forecast whether a firm will issue equity or debt, whereas regressions that incorporate the size of the issue cannot (since they incorporate information not available before announcement of the type of security issued).

Regression (1) in Table 2 shows that investment opportunities play a substantial role in the new issue decision. With our logistic model, an equity issue takes the value one and a debt issue takes the value zero. Therefore, a positive coefficient indicates that a firm is more likely to issue equity. Market-to-book has a positive coefficient that is highly significant. Further, market-to-book has substantial explanatory power in that, if it is omitted, the pseudo- R^2 falls by almost one-third. Other variables indicative of good investment opportunities are significant also. Past cumulative excess returns and leading indicators have positive coefficients with p -values of less than 0.01. Cash flow is not significant, but some variables emphasized by other capital structure theories are significant. The coefficient on tax payments divided by total assets is negative as expected and highly significant. Leverage, as measured by long-term debt to total assets, is insignificant. This result holds when we use alternate leverage measures and is not surprising considering the earlier literature. For instance, Baxter and Cragg (1970) do not find a significant leverage coefficient either, although Marsh (1982) uses deviations from target leverage in his regressions and finds that firms with high leverage relative to a target are more likely to issue equity. Since leverage and volatility are correlated, we omit volatility in a regression not reproduced here; doing so does not make the coefficient on leverage significant. Finally, we would expect slack to have a positive coefficient, but instead it has an insignificant negative coefficient. In regression (2), we add total assets as an explanatory variable. Total assets could be a proxy for the degree of information asymmetry, since large firms are followed more closely by analysts and have more stringent reporting requirements. The coefficient on total assets is significantly negative, indicating that large firms are less likely to issue equity. All our other inferences remain unchanged by the addition of total assets, except that stock return volatility ceases to have a significant effect on the probability of issuing equity.

In regression (3), we add post-issue cumulative excess returns as an explanatory variable. The timing model suggests that the coefficient on post-issue cumulative excess returns should be significantly negative, so that firms expecting poor performance would be more likely to issue equity. We report only the regression with the five-year size-adjusted excess returns. We estimate the same regression using three-year size-adjusted excess returns, three-year and five-year raw returns, and three-year and five-year net-of-market returns, but the coefficient on long-term returns is never significant. This finding has two possible interpretations, however. First, it could mean that timing considerations are not important in firms' decisions. Second, there could be so much variation in the

Table 2
Determinants of firm type

Logistic regressions in which the dependent variable takes the value one for equity issues and zero otherwise. The sample has 276 debt issues and 192 equity issues from 1977 to 1984. Market-to-book is the ratio of firm market value to total assets (*TA*). Cash flow is operating income before depreciation minus total taxes adjusted for changes in deferred taxes, minus gross interest expense and dividends paid on common and preferred stock, divided by *TA*. All book values are obtained from Compustat for the year prior to the issue announcement. The volatility of the stock return is for the period (-240, -40). *MVCS* is the market value of equity. The post-issue cumulative abnormal return is the excess return of issuing firms over firms with similar size before the issue. The pseudo- R^2 equals $1 - (\log\text{-likelihood at convergence} / \log\text{-likelihood at zero})$; *p*-values for the chi-square statistic are in parentheses.

Regression	(1)	(2)	(3)	(4)	(5)
<i>Intercept</i>	- 3.27 (0.01)	2.57 (0.01)	- 3.23 (0.01)	- 2.50 (0.01)	3.16 (0.01)
<i>Tax payments/TA</i>	- 11.99 (0.01)	- 12.97 (0.01)	- 9.31 (0.02)	- 9.09 (0.03)	- 20.37 (0.01)
<i>Long-term debt/TA</i>	0.81 (0.36)	0.25 (0.78)	0.97 (0.31)	1.83 (0.06)	- 1.02 (0.32)
<i>Market-to-book</i>	2.13 (0.01)	1.96 (0.01)	2.06 (0.00)	1.68 (0.00)	2.20 (0.00)
<i>Cash flow</i>	0.11 (0.96)	0.23 (0.93)	0.58 (0.83)	- 2.07 (0.47)	0.96 (0.75)
<i>Stock return volatility</i>	5.40 (0.08)	2.99 (0.35)	5.98 (0.07)	13.24 (0.01)	- 5.86 (0.12)
<i>6-month leading indicators</i>	12.42 (0.01)	12.23 (0.01)	12.20 (0.01)	13.64 (0.01)	13.72 (0.01)
<i>Past 11-month cumulative excess return</i>	2.33 (0.01)	2.29 (0.01)	2.10 (0.01)	2.74 (0.01)	1.53 (0.01)
<i>Cash and liquid assets/TA</i>	- 2.65 (0.18)	- 2.10 (0.29)	- 2.94 (0.17)	- 1.26 (0.60)	- 1.30 (0.57)
<i>Total assets</i>		- 0.01 (0.01)			
<i>Gross proceeds/MVCS</i>				- 5.04 (0.00)	
<i>Log of (Amount/MVCS)</i>					- 1.32 (0.0)
<i>Post-issue 5-year excess returns</i>			- 0.01 (0.75)		
<i>Pseudo-R^2</i>	0.26	0.28	0.26	0.33	0.41
<i>% correct</i>	75.4%	75.8%	74.6%	79.5%	80.8%

cross-sectional post-issue performance of firms that timing considerations are only identifiable in large samples.

To investigate whether our lack of support for the timing model is due to our sample size, we estimate a logistic regression using a sample more comparable in size to the samples used in other long-run performance studies. Our expanded sample includes 2,272 equity issues and 2,617 bond issues from 1970 to 1991 and is constructed from the Registered Offerings Tapes and the Investment Dealer's Digest. This sample includes non-Compustat firms as well as Compustat firms. We compute five-year post-issue buy-and-hold raw returns and size-adjusted excess returns as we did for our original sample. The average return measures are similar to those obtained in the long-run performance studies in that long-run returns following equity issues are significantly negative and large in absolute value and long-run returns following debt issues are insignificantly different from zero. In a logistic regression with the post-issue cumulative returns as the only dependent variable in addition to the constant, the post-issue cumulative returns have a significant negative coefficient irrespective of how they are computed, so that firms with poor post-issue returns are more likely to issue equity. However, post-issue returns seem to explain very little: the pseudo- R^2 is on the order of 0.01 irrespective of how the post-issue returns are computed. The regression with raw returns classifies 63.2% of the observations correctly. The percentage of correct classifications falls to 54.3% for size-matched excess returns. Even with a very large sample, therefore, it still turns out that the timing model is not very helpful in understanding new issue decisions. Interestingly, however, when we add to these regressions the cumulative abnormal return for the year before the issue, this variable has an extremely significant positive coefficient and the pseudo- R^2 increases strongly. In the regression using raw returns, the pseudo- R^2 increases to 0.21 and the fraction of issues predicted correctly increases to 72.8%; in the regression using size-adjusted returns, the pseudo- R^2 increases to 0.09 and the fraction predicted correctly increases to 70.5%.

In regressions (4) and (5), we add measures of the size of the security issue normalized by the market value of the firm's equity as an explanatory variable. These measures of the relative size of the security issue have no impact on the effect of investment opportunities on the new issue decision. Not surprisingly, given the statistics of Table 1, the relative size of the issue is negatively related to the probability of issuing equity. Two firm characteristics seem to have effects that depend on the relative size variable: leverage becomes significant for one relative size measure and volatility ceases to be significant for the other. The size measures have a substantial impact on the explanatory power of the regressions. In regressions not reproduced here, we add total assets and the market value of equity as separate explanatory variables. The addition of these variables does not affect the conclusions drawn from Table 2, but their coefficients are significantly negative. We re-estimate regressions (4) and (5) adding long-term

post-issue abnormal returns as explanatory variables but do not report the results in the table. In the regression with the ratio of proceeds to pre-issue market value of equity, long-term post-issue performance has a positive insignificant coefficient. In the regression with the log of the amount of the issue, the coefficient on long-term performance is negative and significant at the 0.10 level. The coefficient on market-to-book is 2.11 instead of 2.20 and its significance level is unchanged. In this case, the percentage of correct predictions is 81.5% instead of 82.1%. There is therefore no convincing evidence that expectations of long-term cumulative excess returns play an important role in the firm's issue decision.

Although our regressions are parsimonious, they correctly classify a fraction of the decisions similar to the fraction correctly classified in earlier papers. For instance, the frequently cited paper by Marsh (1982) correctly classifies 75% of the decisions, whereas our regressions in Table 2 correctly classify from 74% to 81% of the decisions.

With this logistic model, we have firms that issue equity even though they resemble firms that issue debt. One way to see this is to compare these firms to the firms that issue debt and the firms that issue equity when predicted to do so. To classify firms, we use regression (1) of Table 2. For that equation, the threshold that minimizes the sum of the probability of a type I and the probability of a type II error is 0.42. We find that 46 firms issue equity against type using that threshold. In all characteristics except the ratio of proceeds to the market value of equity, the firms that issue equity when predicted to issue debt are indistinguishable from debt-issuing firms. In contrast, these equity-issuing firms have many characteristics that are significantly different from firms that issue equity and are predicted to do so. The firms issuing equity against type pay more taxes relative to assets than other equity-issuing firms, so that one would expect the tax deductibility of interest to be valuable for them. These firms have less leverage than firms predicted to issue equity, although not significantly so. They issue at times when leading indicators are neutral. Their past abnormal returns are insignificantly different from zero. Their volatility is closer to the volatility of firms issuing debt. Finally, these firms have much poorer investment opportunities than firms predicted to issue equity. Their mean and median market-to-book ratio is only trivially different from the mean and median market-to-book ratio of firms issuing debt. There are no significant cash flow differences among the three sets of firms. Given the characteristics of these firms, it is difficult to argue that they would benefit from the flexibility resulting from issuing equity instead of debt.

Why do these firms issue equity against type? With the pecking-order model, these firms should issue debt if information asymmetries are significant. Hence, these firms might be issuing equity because they happen to have low information asymmetries. Viswanathan (1993) models such deviations from the pecking-order model. In this case, one would expect the information content of equity

issues to be low as well because it must be public knowledge that information asymmetries are low since otherwise firms will face high costs of issuing equity anyway. This would suggest that firms that issue equity against type would have a small stock price reaction. It would not make sense for firms to issue against type if information asymmetries are high because these firms have similar characteristics to debt-issuing firms and therefore could issue debt. The pecking-order model cannot explain why firms for which information asymmetries are high would issue equity when they could issue debt. Equity issues by such firms are consistent with the managerial discretion model, however. Investigating the stock price reaction to equity issues should therefore help us distinguish between the two models.

5. The stock price reactions to security issues and investment opportunities

Among firms issuing equity, there are firms with good investment opportunities and limited debt capacity (provided that we can interpret firms with high leverage to be firms with low debt capacity). One would expect these firms to issue equity if they raise funds and that this action would be in the interest of shareholders. Other firms have poor investment opportunities and look like they could issue debt. The pecking-order model explanation for this behavior is that information asymmetries for these firms are not important, suggesting that the stock price reaction should be small. The agency model, in contrast, predicts large stock price reactions if these issues are unexpected because the shareholders of these firms would be better off having the firm either issue debt or not raise funds. Since firms form a continuum across types, the agency cost model would expect the firms for which issuing equity is the least likely to benefit shareholders to have the largest fall in stock price at the announcement of an equity issue, assuming that all issues are equally unanticipated. Earlier work by Bayless and Chaplinsky (1991) demonstrates, using a different logistic model, that firms issuing unexpectedly according to the logistic model have a greater abnormal return in absolute value. This result holds for our logistic model also. Table 3 provides estimates of the correlation between a firm's type, defined by the probability that a firm will issue equity based on the logistic model of the previous section, and the firm's abnormal return for each type of issue. The correlation estimates for the equity issues are positive and significant; the estimates for debt issues are negative but insignificant. These results are consistent with the agency cost model but cannot be explained with the pecking-order model.

We now turn to the relation between abnormal returns and a firm's investment opportunities. With the managerial discretion model, equity issues are not in the interest of shareholders for firms with poor investment opportunities. The Pearson correlation between the stock price reaction to equity issues and the

Table 3
Correlations between firms' types and abnormal returns

Firm type is obtained from regression (1) of Table 2. Abnormal returns (ARs) are cumulative abnormal returns for days $(-1, 0)$, with day 0 the day of the Wall Street Journal announcement of the security issue.

Correlation measures	Correlation between firm type and ARs for bond issues (<i>p</i> -values)	Correlation between firm type and ARs for equity issues (<i>p</i> -values)
Correlation coefficient between firm type and abnormal returns	0.03 (0.65)	0.17 (0.02)
Spearman rank-sum correlation between firm type and abnormal returns	- 0.07 (0.25)	0.17 (0.02)

market-to-book ratio is 0.22 (*p*-value of less than 0.01) and the Spearman rank-sum correlation is 0.18 (*p*-value of 0.01). When we divide the sample into market-to-book deciles, we find that the highest market-to-book decile has a mean abnormal return of -0.22% whereas the lowest market-to-book decile has a mean abnormal return of -4.60% . Therefore, there is a robust relation between stock price reactions to equity issues and market-to-book. For debt issues, the correlation measures are respectively 0.11 (*p*-value of 0.07) and 0.10 (*p*-value of 0.10). The relation between stock price reactions and market-to-book is much weaker for debt issues. In a regression of abnormal returns on a constant and market-to-book, the coefficient on market-to-book is 0.97 with a *t*-statistic of 2.63 for equity issues and it is 0.51 with a *t*-statistic of 1.39 for debt issues. These results are stronger than the results from earlier research which either uses the market-to-book ratio or Tobin's *q*. Barclay and Litzenberger (1988) and Pilotte (1992) find insignificant results using conventional levels of significance, but they have fewer issues than we do. Denis (1994) has a large sample yet finds a weaker relation than here. However, our sample stops in 1984, so that it is not affected by the subsequent change in reporting practices of the Wall Street Journal.³

Market-to-book is positively correlated with a variable emphasized in models that focus on adverse selection, namely the runup in the firm's stock

³Before 1985, the WSJ reports on equity issues as a regular news item. From 1985, most of the information on new issues is reported in the 'new securities issues column' which contains mostly offering information. Hence, the event dates since 1985 reflect issues that are more likely to be anticipated because the announcement of an equity issue is typically made earlier (by days or weeks) via news-wire services than the WSJ listing. This biases the abnormal return estimate.

price before the issue. Market-to-book is also likely to be correlated with other variables emphasized in the literature. Therefore, it is important to investigate whether the relation between abnormal returns and market-to-book can be attributed to its role as a proxy for other variables that may have nothing to do with managerial discretion. We investigate this in Table 4 for stock issues. It is immediately apparent that the coefficient on market-to-book is not affected by the inclusion of the additional variables emphasized by the earlier literature. In these regressions, though, the stock runup is not significant and the leading indicators are not significant either. It seems therefore that market-to-book dominates the variables emphasized in papers that focus on adverse selection. When we regress the abnormal return on market-to-book and past cumulative abnormal returns alone, the coefficient on past cumulative abnormal returns is 1.62 with a *t*-statistic of 1.52, while market-to-book has a coefficient of 0.93 with a *t*-statistic of 2.52. The inclusion of market-to-book results in a substantial weakening of the variables emphasized in papers that focus on adverse selection.

Is market-to-book successful because it proxies for the firm overvaluation that underlies the timing model? In regression (8) of Table 4, we include the long-term cumulative excess return as an explanatory variable. Presumably, firms that are more overvalued have more negative cumulative excess returns. The coefficient on long-term cumulative excess return is insignificant. More importantly, though, the coefficients on the other variables, especially our proxy for investment opportunities, are not significantly altered. We also estimate regressions (9) and (10) with the same long-term cumulative excess return as a dependent variable. The cumulative excess return is never significant. Finally, we estimate regression (7) using three-year and five-year raw returns, three-year and five-year net-of-market returns, and three-year size-adjusted returns. Only one coefficient is significant, but it has the opposite sign from the prediction of the timing model that investors underreact to the announcement. The coefficient on five-year raw returns is negative with a *t*-statistic of -1.72 . If taken seriously, this estimate implies that the stock price reaction is closer to zero for firms that underperform more after the issue. None of this evidence is supportive of the view that the stock price reaction to an equity issue is a fraction of the long-run cumulative excess returns.

We estimate similar regressions for debt issues, but do not report them here. The only variable that is ever significant in these regressions is the amount of the issue divided by the value of common stock, which has a coefficient of -1.57 and a *t*-statistic of -1.97 . The adjusted R^2 for these regressions is never greater than zero.

Table 5 shows the abnormal returns for equity issues divided according to the purpose of the issue. The results provided are consistent with the role of agency costs in the new issue decision. An equity issue allows firms with poor investment opportunities to invest in poor projects and/or to reduce the disciplinary

Table 4

Cross-sectional regressions of equity issue abnormal returns on firm characteristics

Abnormal returns (ARs) are cumulative abnormal returns for days (-1, 0), with day 0 the day of the Wall Street Journal announcement of the security issue. The regression models are estimated using weighted least squares with the weight for each issue being the inverse of the variance of the market model residual for the firm issuing the security. The sample includes 189 equity issues from 1977 to 1984. The proceeds of an issue correspond to the gross proceeds in millions of dollars. Market-to-book is the ratio of firm market value (market value of equity plus book value of total assets minus book value of equity) to total assets (TA). Cash flow is operating income before depreciation minus total taxes adjusted for changes in deferred taxes, minus gross interest expense and minus dividends paid on common and preferred stock. All book values are obtained from Compustat for the year before the announcement. The leading indicators are the six-month leading indicators. The volatility of the stock return is computed for the period (-240, -40). The post-issue cumulative excess returns are five-year size-adjusted returns. *T*-statistics are given in parentheses.

Regression	(6)	(7)	(8)	(9)	(10)
<i>Intercept</i>	3.72 (-3.64)	-3.86 (-3.75)	-4.15 (-3.82)	-4.061 (-3.77)	-3.94 (-2.83)
<i>Market-to-book</i>	0.97 (2.11)	1.01 (2.20)	0.96 (2.00)	0.95 (2.08)	0.97 (2.11)
<i>Cash TA</i>	-6.78 (-1.63)	-6.29 (-1.50)	-8.27 (-1.85)	-7.82 (-1.82)	-6.73 (-1.61)
<i>Tax payments TA</i>	-6.09 (-0.73)	-4.65 (-0.55)	-1.94 (-0.22)	-5.41 (-0.65)	-5.68 (-0.67)
<i>Long-term debt, TA</i>	-1.14 (-0.61)	-1.51 (-0.80)	1.54 (-0.73)	-1.09 (-0.59)	-1.13 (-0.60)
<i>Cash flow</i>	5.09 (0.89)	3.72 (0.64)	5.03 (0.83)	6.17 (1.06)	4.87 (0.84)
<i>Stock return volatility</i>	-3.49 (-0.49)	-0.55 (-0.07)	3.23 (-0.39)	-4.76 (-0.66)	-2.74 (-0.35)
<i>Leading indicators</i>	1.64 (0.32)	1.31 (0.25)	1.18 (0.22)	2.20 (0.42)	1.48 (0.28)
<i>Past cumulative excess return</i>	1.68 (1.53)	1.79 (1.62)	1.31 (1.09)	1.59 (1.44)	1.71 (1.54)
<i>Total assets</i>		0.00 (1.07)			
<i>Post-issue cumulative excess return</i>			-0.08 (-0.70)		
<i>Proceeds Market value of common stock</i>				2.47 (1.00)	
<i>Log of proceeds</i>					0.05 (0.24)
<i>Adjusted R²</i>	0.04	0.04	0.04	0.04	0.03

Table 5
Abnormal returns of equity issues by purpose of issue

Abnormal returns (ARs) are cumulative abnormal returns for days $t = -1, 0$, with day 0 the day of the Wall Street Journal announcement of the security issue. The purpose of the issue is obtained from the Wall Street Journal announcement. We do not reproduce results for cells smaller than 10 or when the purpose could not be determined unambiguously.

Purpose	Number of issues	Abnormal return	t-statistic
To repay bank debt	26	- 2.93	4.54
Capital expenditures	40	- 3.04	- 5.16
To repay long-term debt	20	- 4.15	- 6.16
To repay short-term debt	15	- 1.16	- 1.15
Working capital	51	- 2.34	4.43

role of debt. The stock price reactions for firms that plan to use the proceeds for capital expenditures, firms that plan to replace long-term debt, and firms that plan to replace bank debt are above the average stock price reaction of the whole sample. At the 0.10 level, firms that plan to replace long-term debt have significantly lower abnormal returns than firms that plan to use the proceeds to replace short-term debt or to invest in working capital; further, at the 0.11 level, firms that plan to use the proceeds for capital expenditures have significantly lower abnormal returns than firms that plan to replace short-term debt. The p -values for the other differences are much higher. We investigate whether there is a relation between firm type and the abnormal return for a given issuing purpose. The problem with this investigation is that the cell sizes become small. Nevertheless, it is interesting that the 11 firms that are not of the equity-issuing type and plan to use the proceeds for capital expenditures have an average abnormal return of -4.43% with a t -statistic of -5.52 , whereas the 29 firms of the equity-issuing type that plan to use the proceeds for capital expenditures have an average abnormal return of -2.52% with a t -statistic of -3.41 . The difference between these two abnormal returns has a t -statistic of 1.75. This evidence should be treated with caution given the cell sizes, but it nevertheless provides support for the argument that outsiders view a firm that invests the proceeds when it is not of the equity-issuing type negatively.

It is often argued that agency costs of managerial discretion are lower for firms with high managerial ownership because management bears more of the monetary consequences from pursuing its own objectives. We have managerial ownership data available from Value Line for 100 equity-issuing firms. For this smaller sample, we find that when we split the sample into high and low ownership, the low-ownership sample has a mean abnormal return of -3.71% and the high-ownership sample has a mean abnormal return of -2.56% . The difference between the two groups is 1.16% with a t -statistic of 1.72. This

difference could be size-related since ownership is inversely related to size, but when we split the sample according to firm size, there is no difference in abnormal returns.

6. Ex post characteristics of firms issuing debt and equity

So far, we have shown that the typical equity-issuing firm has good investment opportunities compared with the typical debt-issuing firm, and that the market reaction to an equity issue is positively related to the issuing firm's investment opportunities. It could be that firms issuing equity with poor investment opportunities do so because they believe that they are worth less than the market's valuation since they are low market-to-book firms. If this were the case, these firms should invest less than the other equity-issuing firms. In contrast, agency considerations predict that these firms issue equity for investment purposes even though they have poor investment opportunities.

In this section, we investigate whether the post-issue characteristics of firms issuing equity against type resemble those of debt-issuing firms of similar type or those of equity-issuing firms of different type. We provide this information for all firms issuing a type of security and for subsamples of firms that issue as expected and those that do not. To distinguish between firms that are expected to issue a security and those that are not, we proceed in the same way as discussed at the end of Section 4 by defining firms predicted to issue equity as all those firms that have a probability of issuing equity greater than 0.42 using regression (1) of Table 2. For each variable, we compute the change in the variable from the fiscal year before the issue to the fiscal year after the issue, expressed as a percentage of the variable in the fiscal year before the issue. We reproduce the change in cash flow and leverage, even though the type of security issued affects these variables directly, reducing cash flow and increasing leverage for debt-issuing firms compared with equity-issuing firms.

The results of Table 6 are striking. Firms predicted to issue debt that actually issue equity invest more than the comparable debt-issuing firms: their plant, property, and equipment (*PP&E*), total assets, and capital expenditures all grow at a significantly higher rate. The differences in growth are economically large: a firm issuing equity against type has 20% more *PP&E* at the end of the year following the security issue than a firm expected to issue debt. Since both categories of firms have similar market-to-book ratios, these results are fully consistent with the view that firms that issue equity against the pecking order do so to pursue a more aggressive investment policy that is not in the interest of their shareholders. Compared to the firms expected to issue equity, the firms that issue equity when expected to issue debt have total assets that grow at a significantly lower rate, but their *PP&E* and capital expenditures have insignificantly different growth rates than firms that issue equity as expected. *EBIT*

Table 6

Percentage changes in firm characteristics according to firm type and security type for the three-year period overlapping the security issue

The sample includes 283 debt issues and 189 equity issues from 1977 to 1984. Cash flow is operating income before depreciation minus total taxes adjusted for changes in deferred taxes, minus gross interest expense and minus dividends paid on common and preferred stock. *TA* denotes the book value of assets. For each characteristic, we use Compustat to compute the percentage increase from the year before the issue to the year after the issue. High-type firms are those expected to issue equity based on regression (1) of Table 2.

	Bond issues (Number of firms)	Equity issues (Number of firms)	Difference (<i>t</i> -statistic)
<i>PP&E</i>	41.83% (267)	68.19% (178)	- 26.36% (- 4.42)
<i>PP&E, low type</i>	38.48% (210)	58.98% (46)	- 20.50% (- 1.77)
<i>PP&E, high type</i>	54.16% (57)	71.39% (132)	- 17.24% (- 1.73)
<i>Total assets</i>	37.83% (269)	65.60% (180)	- 27.77% (- 5.79)
<i>Total assets, low type</i>	32.70% (211)	45.82% (46)	- 13.13% (- 2.11)
<i>Total assets, high type</i>	56.50% (58)	72.39% (134)	- 15.88% (- 1.70)
<i>Net capital expenditures</i>	51.57% (210)	107.50% (177)	- 55.93% (- 3.57)
<i>Net capital expenditures, low type</i>	43.12% (206)	93.92% (46)	- 50.80% (- 1.70)
<i>Net capital expenditures, high type</i>	82.67% (56)	112.27% (131)	- 29.60% (- 1.20)
<i>Long-term debt/TA</i>	36.55% (268)	- 8.18% (181)	44.73% (- 4.52)
<i>Long-term debt/TA, low-type firms</i>	40.67% (210)	- 5.45% (46)	46.13% (3.20)
<i>Long-term debt/TA, high-type firms</i>	21.65% (58)	- 9.11% (135)	30.76% (2.33)
<i>Cash flow</i>	- 17.50% (265)	2.08% (178)	- 19.58% (- 1.90)
<i>Cash flow, low-type firms</i>	- 21.85% (209)	0.96% (45)	- 22.81% (- 2.71)
<i>Cash flow, high-type firms</i>	- 1.25% (45)	2.46% (133)	- 3.71% (- 0.19)
<i>EBIT</i>	15.45% (266)	53.15% (181)	- 37.70% (- 2.28)

Table 6 (continued)

	Bond issues (Number of firms)	Equity issues (Number of firms)	Difference (t-statistic)
<i>EBIT, low type</i>	6.84% (210)	10.60% (46)	- 3.76% (- 0.11)
<i>EBIT, high type</i>	47.72% (56)	67.65% (135)	- 19.92% (- 1.01%)
<i>Change in dividend yield</i>	0.18 (269)	- 0.10 (183)	0.28 (1.78)
<i>Change in dividend yield, low type</i>	- 0.02 (209)	- 0.21 (48)	0.19 (0.77)
<i>Change in dividend yield, high type</i>	0.84 (60)	0.07 (135)	0.91 (3.98)
<i>Five-year size-matched excess return</i>	2.03 (242)	- 32.69% (178)	34.72 (1.33)
<i>Five-year size-matched excess return, high type</i>	11.04% (56)	- 39.20% (135)	50.24% (0.88)
<i>Five-year size-matched excess return, low type</i>	- 0.69% (186)	- 12.26% (43)	11.58% (0.31)

increases substantially for the firms expected to issue equity but not for the firms that issue equity when expected to issue debt. We also report some evidence on dividend policy. Firms issuing equity have a drop in dividend yield in contrast to firms issuing debt. Though firms issuing equity against type form the subsample with the largest drop in dividend yield, the difference between the change in dividend yield for that subsample and for the subsample of firms issuing debt according to type is not significant.

We explore the long-term stock performance of the issuing firms according to their type and find that for all subsamples, equity-issuing firms have mean cumulative excess returns that are much lower than debt issuing firms, although the mean differences are not significant. The firm characteristics that proxy for agency costs are not helpful in explaining the cross-sectional variation in post-issue cumulative abnormal returns. Such a result is not surprising for those who believe that markets are efficient. It points towards a risk-based explanation of long-term abnormal returns.

7. Conclusions

In this paper, we investigate the empirical relevance of three explanations of the security issue decision: the pecking-order model, the agency model, and the timing model. Our results support the agency model. We show that the typical

firm issuing equity has valuable investment opportunities and experiences considerable asset growth: from the year before the equity issue to the end of the year following the issue. Firms with the most valuable investment opportunities do not experience adverse stock returns when they issue equity. We find that some firms with poor investment opportunities issue equity even though the pecking-order model suggests that they should issue debt to raise funds. These firms, otherwise similar to debt-issuing firms, experience substantially higher asset growth than debt-issuing firms. However, they register an extremely significant drop in their share price when they issue. Though it is true that these firms reveal that they are overvalued when they issue, an explanation consistent with this excessive valuation is that, given their investment opportunities, the market did not expect these firms to issue equity and does not expect the investments undertaken with the proceeds to increase shareholder wealth. The behavior of the firms issuing equity against type is inconsistent with the pecking-order model or asymmetric information models which assume that managers maximize shareholder wealth. If the firms that issue against type have valuable investment opportunities that are not recognized by the financial markets, they should not be issuing equity since their equity is underpriced and they could issue debt. The evidence we present in this paper is also inconsistent with the view that firms time equity issues to take advantage of equity overvaluation when they know that the firm's equity will underperform in future years.

An agency approach that emphasizes the costs of managerial discretion provides a consistent framework in which evidence on the issue decision, the stock price reaction, and the post-issue investment policy of the issuing firm can be understood. In contrast to the agency model, models based on information asymmetries alone are at best consistent only with our evidence on the stock price reaction, and the timing model receives almost no support in our sample.

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