



Pecking order, access to public debt market, and information asymmetry



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ABSTRACT

We suggest that the limited access to the public debt market is a reason for the violations of pecking order behavior documented in literature. We show that as information asymmetry increases, two effects take place. On the one hand, firms do desire to increase the debt issuance. On the other hand, firms start to lose their access to the public debt market. As a result, firms associated with high degrees of information asymmetry can only issue private debt and face the relatively low debt capacities provided in the private debt market.

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1. Introduction

The pecking order theory (Myers & Majluf, 1984) posits that when there is information asymmetry between insiders and outside investors of a firm, the firm will prefer debt to equity, because of the lower informational premium in debt capital. With the information asymmetry measures developed in the market microstructure literature, Bharath, Pasquariello, and Wu (2009) provide supportive evidence for the pecking order hypothesis and show that firms with higher degrees of information asymmetry indeed have higher leverage and issue more debt to meet their financing deficits.

Although Bharath et al. (2009) present evidence on the association between information asymmetry and preference for debt financing, they also document a limited accuracy of the pecking order theory for predicting the financing decisions made by firms with high information asymmetry. In their post-1990 sample, Bharath et al. find that firms in the lowest information asymmetry decile on average issue debt to finance 7.7% of their deficits, whereas firms in the highest information asymmetry decile issue debt to finance 35.5% of their deficits. The low dependence on debt financing for low-information-asymmetry firms is expected, considering the low informational premium in equity capital that these firms face. The moderate dependence on debt financing for high-information-asymmetry firms, however, is puzzling, since these firms are supposed to face expensive equity capital and have strong preference for debt financing.

In this paper we suggest and present evidence that the constraints facing firms in the public debt market help to explain such a puzzling finding. According to Myers and Majluf, a firm's debt issuance (public or private) relative to its equity issuance should increase in information asymmetry until the debt capacity is exhausted. Bolton and Freixas (2000) formalize this rationale and provide a theory endogenizing the origin of debt capacity. They show that when there is information asymmetry between the corporate insiders and outside investors, both debt and equity investors will demand an informational premium in order to

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compensate for the risk associated with such a transaction. However, compared to public debt investors, private debt investors are better able to serve borrowers with informational problems for several reasons. For instance, private investors may gain inside information on the borrowers through a long-term relationship and can better monitor the borrowers after the lending (Houston & James, 1996; Petersen & Rajan, 1994).

By capturing the magnitude of the moral hazard problem with firm riskiness, Bolton and Freixas' model characterizes three regimes of financing decisions. First, a low-risk firm regards issuing public debt as the most favorable financing method. Second, when a firm's riskiness increases to the lower cutoff point, it faces a high premium in the public debt market and has to turn to the private debt market. Third, if the firm riskiness increases to the higher cutoff point, then the firm faces constraints in the private debt market as well and can only issue equity as the last resort.

The illustration of corporate financing behavior in Bolton and Freixas' model raises an interesting empirical question: As the information asymmetry increases, can firms replace equity with public debt so as to follow the pecking order? In other words, is the cost of public debt capital indeed less sensitive to information asymmetry than is the cost of equity capital due to the "information insensitive" nature of the debt contract, as suggested by Myers and Majluf? The answer to this question has an important implication on a firm's ability to follow the pecking order behavior.

Access to the public debt market has recently been identified as an important factor to capital structure. Faulkender and Petersen (2006) document that after controlling for a large set of relevant firm characteristics, the average leverage ratio of the firms that can access the public debt market is still 10.5% higher than that of the firms that can only access the private debt market. They therefore conclude that the supply-side factor matters: Firms that can access the public debt market enjoy higher debt capacities and are less likely to underleverage. Lemmon and Zender (2010) also use access to the public debt market to proxy for debt capacity and show that firms that are able to issue public debt indeed issue more debt to meet their financing needs. Therefore, if firms' access to the public debt market shrinks quickly when information asymmetry increases, the moderate dependence that high-information-asymmetry firms have on debt financing should not come as a surprise, because they are only provided with lower debt capacities in the private debt market.

To conduct an empirical investigation, from 10-K filings we collect a detailed balance sheet dataset of the outstanding public and private debts of 220 U.S. firms over the 1997–2007 period. We decompose the conventional leverage ratio into two components: public debt–equity ratio and private debt–equity ratio. For ease of reference, we shall call these two ratios public leverage and private leverage in the remainder of the paper. To measure the degree of informational problems associated with firms, we follow Bharath et al. (2009) to extract the first principal component from a set of market microstructure-based measures and set it to be our measure of information asymmetry. When examining the two leverage ratios separately, we find that the positive relationship between leverage and information asymmetry documented in Bharath et al. (2009) is almost entirely driven by the effect of information asymmetry on private leverage; there is no significant linear relationship between public leverage and information asymmetry. In other words, as information asymmetry increases, firms replace equity with mostly private debt.

One possible explanation for the insignificant relationship between public leverage and information asymmetry is that the relationship between the two is actually non-linear. When we add a squared term of our information asymmetry measure into the regression models, we document a significant inverse U-shaped relationship between public leverage and information asymmetry. Such an empirical finding is consistent with the prediction of Bolton and Freixas (2000). When the information asymmetry is at a relatively low level, firms are well-received in the public debt market and are able to issue public debt to replace equity as the information asymmetry increases. However, when the information asymmetry exceeds a certain threshold, firms start to face constraints in the public debt market and are forced to turn to private debt and equity markets.

We next seek evidence that firms having access to the public debt market indeed enjoy higher debt capacities and are more able to follow the pecking order behavior. Faulkender and Petersen (2006) suggest that firms with better access to the public debt market are less likely to underleverage. If this is the case, then as information asymmetry increases, those firms with better access to the public debt market should exhibit a stronger tendency towards issuing debt. Using the public debt-to-total debt ratio as the proxy for access to the public debt market, we find that given the same increase in information asymmetry, firms with better access to the public debt market indeed increase their leverage ratios by a larger amount. Further evidence is found with the modified Shyam-Sunder and Myers (1999) test proposed in de Jong, Verbeek, and Verwijmeren (2010). De Jong et al. investigate if firms' financing policies are different when they face ordinary versus large financing deficits. The idea is that firms facing constraints in the debt market are more likely to exhaust their debt capacities when they have large deficits. We find that among the firms that face high information asymmetry and thus have high preference for debt financing, those with poor access to the public debt market still increase their equity issuance to meet large deficits. Such evidence strongly supports the hypothesis in Faulkender and Petersen (2006) that the access to the public debt market is an important determinant of the debt capacity.

We lastly examine whether firms in new- and old-economy industries exhibit different financing preferences when confronting information asymmetry. Prior studies show that corporate capital structure varies systematically across industries (Kayhan & Titman, 2007; Lemmon, Roberts, & Zender, 2008; Tucker & Stojta, 2011). Consistent with the evidence in the literature, we find that old-economy firms follow the pecking order more closely than do new-economy firms. We also find that despite their good access to the debt market, old-economy firms still have to rely on private debt financing when facing severe informational problems. Our evidence indicates that private debt issuance is important for the old-economy firms wanting to pursue debt financing.

The evidence presented in this study contributes to the literature by providing an explanation for the contradictory evidence found in empirical tests of the pecking order theory. Helwege and Liang (1996) study the subsequent financing decisions of a

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