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Information precision and IPO pricing ☆

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ABSTRACT

This paper investigates the role of information precision in IPO pricing. The model shows that more precise information will exert more influence on the offer price. In strong support of the model, I find that the proportion of the industry return during the waiting period that is incorporated into the offer price increases with a proxy for the precision of the industry return as a measure of the change in the IPO firm's value during the waiting period. The model and the empirical findings enhance our understanding of the partial adjustment phenomenon: noisy information will be partially incorporated into the offer price.

1. Introduction

During the waiting period, which is from the initial public offering (IPO) filing to the offering, the issuer learns more information about the IPO firm's value. The information can be divided into two categories, private information and public information, depending on whether it is publicly observable. The private information is owned by investors and is subsequently revealed to the issuer in these investors' bids for IPO shares. The public information is observed by both the investors and the issuer. The most important public information during the waiting period is the market/industry return. The literature terms investor bids and the market/industry return during the waiting period as private information and public information, respectively.

There have been extensive studies of the effect of private and public information on the offer price.[1] Nevertheless, the role of precision of the private and public information in IPO pricing remains underexplored: the study by Cornelli and Goldreich (2003) is the only examination of this issue that I am aware of. The authors analyze proprietary data of more than 60 international equity offerings by a European investment bank, and find that investor bids are more influential on the offer price when they show a consensus among investors. Their finding suggests that precision of the private information is an important determinant of the offer price. Why is information precision important in IPO pricing? Does precision of the public information also affect the offer price? This paper attempts to answer these questions, both theoretically and empirically.

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[1] See Benveniste and Spindt (1989), Bradley and Jordan (2002), Edelen and Kadlec (2005), Hanley (1993), Loughran and Ritter (2002), and Lowry and Schwert (2004). Section 2 briefly reviews this literature.

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One reason why the role of information precision in IPO pricing is underexplored lies in that the previous theories usually assume that either the issuer or investors know the true value of the IPO firm. Consequently, information precision is not considered in those models.[2] For example, Allen and Faulhaber (1989) and Grinblatt and Hwang (1989) assume that the issuer knows the true value. It is true that the issuer is involved with the IPO firm's daily operations and thus may know more about its future cash flows. The firm's value, however, also depends on information outside the firm, such as macroeconomic conditions, industry prospects, and financial market conditions. Sophisticated investors are arguably more knowledgeable about this information. This argument has led Rock (1986) to assume that investors know the true value, while the issuer does not. The reality may be somewhere between these two extreme cases: both the issuer and the investors have access to some information about the value of the offering firm, but neither knows the true value. I am not criticizing these theories, which shed bright light on our understanding of many aspects of equity offerings. Instead, my intention is to show that information precision also plays an important role in IPO pricing.

I model the going-public process where both the issuer and a representative investor observe noisy signals about the firm value. This model allows me to investigate the role of information precision in IPO pricing. In the model a risk-averse issuer who owns the whole firm tries to sell some shares to a risk-averse investor. Before the IPO filing, each party observes a noisy private signal of the firm's value. Right before the offering, both parties observe a noisy public signal regarding the change in the IPO firm's value during the waiting period. The issuer determines the filing price, the number of shares filed, the offer price, and the number of shares offered. The fully revealing equilibrium is characterized by partial adjustment of the offer price with respect to both the private and the public information. The information is fully incorporated into the offer price only when it contains no noise.

Another distinct feature of the model is that the number of shares offered is also endogenously determined. In equilibrium, the firm adjusts the number of shares offered with respect to both the private and the public information. Positive information, be it private or public, increases the expected firm value and thus the offer price. Consequently, the investor demands more shares, while the risk-averse issuer wants to invest less in the risky firm because positive information increases her expected wealth. As a result, positive (negative) information results in more (fewer) shares being sold to the investor.

The model produces several predictions that are distinct from the models in the prior literature. It predicts that the proportions of the private and public information that are incorporated into the offer price increase with their respective precision. It also predicts that the number of shares offered increases with the market/industry return during the waiting period.

The second part of the paper tests the model's predictions. Because the private information (investor bids) is unobserved, the tests focus on the predictions that are related to the public information. The public information is proxied with the industry return during the waiting period. Its precision, by definition, is accuracy of the industry return as a measure of the change in the IPO firm's value during the waiting period. The change in the IPO firm's value may be caused by either industry-wide information or unobserved firm-specific information or by both. Therefore, precision of the industry return is the fraction of the variance of the IPO stock return that is explained by the industry return, or the R^2 of the regression of the IPO stock return on a constant and the industry return. Unable to observe the IPO's stock return before the offering, I proxy the precision with the average R^2 of the IPO firm's industry peers.

Employing a sample of 5746 IPOs over the period 1985–2006, I find that the industry R^2, a proxy of the precision of the industry return, significantly affects the fraction of the industry return that is incorporated into the offer price. On average, 37% of the industry return is incorporated into the offer price. The fraction significantly increases by 15 percentage points for each 10% increase in the R^2. I also find that the number of shares offered is positively associated with the industry return during the waiting period. These findings are consistent with the predictions of the model.

The prior literature suggests that IPOs with a volatile firm value are associated with greater initial returns. For example, the winner's curse model of Rock (1986) predicts that IPOs that are more difficult to value will be underpriced by more. This prediction has received considerable empirical support (Lowry et al., 2010; Tinic, 1988). The current paper differs from this literature in at least two respects. First, this literature studies the relation between uncertainty of the IPO firm's value and underpricing, while the current paper investigates how precision of the information during the waiting period affects adjustments of the offer price and the number of shares offered. Second, Rock (1986) assumes that investors know the true value of the IPO firm while the issuer does not. This information asymmetry results in underpricing of the IPO. In contrast, I assume that neither the issuer nor the investors know the true value.

This paper extends the literature in at least three respects. First, it complements Cornelli and Goldreich (2003) by extending their findings on the precision of the private information to the precision of the public information. Second, it builds a framework for investigating the role of information precision in IPO pricing. Third, it sheds light on the partial adjustment phenomenon, a phenomenon where only part of the information during the waiting period is incorporated into the offer price. The results of this paper suggest that noisy information will be partially incorporated into the offer price. Full adjustments occur only when the information reveals the true firm value or contains no noise. Given the difficulties in determining the true value of an IPO firm before the offering, it is not surprising to observe partial adjustments. Although information precision alone cannot fully explain the partial adjustment phenomenon, it complements the existing explanations such as those made by Benveniste and Spindt (1989), Edelen and Kadlec (2005), and Loughran and Ritter (2002).

[2] See, among others, Allen and Faulhaber (1989), Benveniste and Spindt (1989), Grinblatt and Hwang (1989), Leland and Pyle (1977), Myers and Majluf (1984), Rock (1986), Sherman (2000), Sherman and Titman (2002), Welch (1989), and Welch (1992). One exception is Yung (2005), who assumes that both underwriters and investors are able to acquire noisy information of the firm value.