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THREE ESSAYS IN CORPORATE FINANCE

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ABSTRACT

This dissertation consists of three essays in corporate finance. The first essay, co-authored with Thomas Chemmanur, develops a theoretical analysis of the choice of firms between fixed-price offerings and uniform-price auctions for selling shares in IPOs and privatizations. We consider a setting in which a firm goes public by selling a fraction of its equity in an IPO market where insiders have private information about intrinsic firm value. Outsiders can, however, produce information at a cost about the firm before bidding for shares. Firm insiders care about the extent of information production by outsiders, since this information will be reflected in the secondary market price, giving a higher secondary market price for higher intrinsic-value firms. We show that auctions and fixed-price offerings have different properties in terms of inducing information production. Thus, in many situations, firms prefer to go public using fixed-price offerings rather than IPO auctions in equilibrium. We relate the equilibrium choice between fixed-price offerings and IPO auctions to various characteristics of the firm going public. Our model is able to explain not only the empirical finding that underpricing is lower in IPO auctions than in fixed-price offerings (in countries where the two mechanisms co-exist), but also the fact that, contrary to the implications of auction theory, auctions are losing market share around the world. Our model thus suggests a resolution to the above "IPO auction puzzle," and indicates how current IPO auction mechanisms can be reformed to become more competitive with fixed-price offerings.

The second essay, co-authored with Yingmei Cheng and Jun Qian, examines the role of financial analysts in helping fund managers make better investment decisions. First, we model how a fund manager utilizes reports on a stock produced by two analysts:
a biased sell-side analyst who works for an outside brokerage firm, and an unbiased buy-side analyst who is employed by the fund. The fund manager's action is based on her optimal weighting of the two reports. We demonstrate that the optimal weight put on the buy-side analyst's report increases when the quality of the buy-side analyst's signal on the stock increases, or when the quality of the sell-side analyst's signal decreases, or when the sell-side analyst's degree of bias increases, or when the uncertainty in the bias of the sell-side analyst increases. Second, using a unique data set of U.S. equity funds, we find, consistent with our model, that fund managers rely more on buy-side research relative to sell-side and other research, when: 1) sell-side analysts' coverage on the stocks held by the fund decreases, 2) the average error in sell-side analysts' earnings forecasts on these stocks increases; 3) the size of assets under fund management is larger; and 4) the fund offers performance-based fees. Finally, we find that fund performance improves when the buy-side analysts are more experienced, or when the fund's reliance on buy-side research increases.

The third essay models the incentives of financial analysts to produce firm-specific versus industry-level information. An analyst covering a stock produces information and sells it to an investor. The investor trades and pays a fraction of the profit to the analyst. I show that, for firms in mature industries, the investment value of additional firm-specific information (conditional on the information already reflected in the firm's stock price) is greater than the investment value of additional industry-level information. This gives analysts an incentive to produce more firm-specific information. In contrast, for firms in emerging industries, analysts have an incentive to produce more industry-level than firm-specific information. The model thus provides a rational explanation for "tunnel vision" among analysts—the popular notion that they pay more attention to firm-specific issues than to broad industry and market conditions. We empirically test the predictions of the model using earnings forecasts from IBES. The evidence is strongly consistent with the predictions. In the overall sample (dominated by firms in mature industries), stock prices react more to firm-specific earnings forecast changes than to industry-level earnings forecast changes. This is reversed for firms in emerging industries: in this case, stock prices react more to industry-level information than to firm-specific information.
HOW SHOULD ENTREPRENEURS SELL EQUITY IN INITIAL PUBLIC OFFERINGS?

FIXED-PRICE OFFERINGS VERSUS IPO AUCTIONS

Initial public offerings (IPOs) of equity are important for entrepreneurs, venture capitalists (VCs), and angels for two reasons. First, at a certain stage in its life, a private firm owned by entrepreneurs, VCs, or angels needs to bring their firm public to fund its further growth. Second, an IPO is one of the two main exit strategies for VCs and angels (the other form of exit is through acquisition by another firm).

In the case of an IPO, the optimal method of selling equity has been the subject of considerable debate recently. Currently, there are two major IPO mechanisms: (1) fixed-price offerings, where the firm goes public by setting a fixed-price for the equity, in consultation with the investment bank taking it public; and (2) IPO auctions, where the investors submit bids to the issuer and the offering price is a uniform price at which all shares can be sold.

The question addressed by this research is the following: which mechanism should entrepreneurs and VCs choose to bring their firms public: fixed-price offerings or auctions? Many economists have argued recently, based on results from the economic theory of auctions, that the best way to sell stock in IPOs is to conduct an auction of the shares of the company going public. Empirically, researchers in finance have found that IPO auctions are associated with less under-pricing compared to non-auction mechanisms. For example, researchers find that IPOs conducted by auctions have much lower under-pricing than those conducted by fixed-price offerings in France.
Similar evidence has been documented in other countries around the world (e.g., Japan, Taiwan, and the United Kingdom).

Despite this lower under-pricing, IPO auctions are losing market share to fixed-price offerings worldwide. At one time or another, IPO auctions have been used in Belgium, Brazil, Chile, Hong Kong, Israel, Japan, Korea, Portugal, Singapore, and Switzerland, among others. They have fallen out of use in many of these countries. Several scholars have characterized this as an "IPO auction puzzle." This paper develops a theoretical analysis rooted in the realities of financial economics to resolve this puzzle. We point out two problems with the argument that auctions maximize the proceeds from IPOs and therefore are the optimal way of selling shares in IPOs. First, the objective of entrepreneurs or VCs is not to maximize the proceeds from a one-time sale of stock. This is because entrepreneurs or VCs care about the price of their stock in the secondary market. In the case when the entrepreneurs or VCs use IPOs to raise money, they care about the secondary market price of their stock because many of them wish to sell more equity two or three years down the road from an IPO. In the case where entrepreneurs or VCs want to exit the firm, they face a "lockup period" after IPO during which they cannot sell their shares. Thus, in practice, entrepreneurs or VCs face a dynamic choice: they want to obtain high proceeds from the sale of stock in the IPO, but they also care about the secondary market price of their stock after the IPO.

The second problem with existing arguments about the optimality of IPO auctions is that they take the information structure of the problem as given. In other words, in much of auction theory, the information that various bidders have about the value of the object being sold is taken as unalterable. In practice, investors in the new issues market can
devote time and other resources to learn more about the true value of the firm going public. Why is this important? It is important because different IPO mechanisms have different properties in terms of inducing information production. In particular, we have shown that in many situations, a fixed-price offering can induce more investors to learn about the true value of the issuing firm compared to an IPO auction.

Combining the above two ingredients, we have shown that in many cases, an entrepreneur that wishes to maximize a dynamic objective function would in fact choose a fixed-price offering rather than an IPO auction. The intuition behind this argument is as follows. Auctioning off shares in a setting where outsiders can learn more about the company at a cost will maximize the proceeds from a one-shot offering, but will not maximize the long-run value, since not enough investors will choose to produce information about the firm the entrepreneur owns. Higher-intrinsic-value firms, knowing that they are going to “pool” with lower-intrinsic-value firms, care about inducing a large number of outsiders to learn about the company, since this information will be reflected in the secondary market price (thereby leading to a higher secondary market price for truly higher-value firms). Thus, in equilibrium, high-value firms would prefer to sell their shares in a fixed-price offering (rather than auctioning them off) because the former is the mechanism which will maximize the combined proceeds to entrepreneurs and VCs.

We have also solved for the optimal IPO selling mechanism depending on various characteristics of the firm going public. The first result of our model is that entrepreneurs will choose fixed-price offerings if the information production cost is high, and they will choose auctions if the information production cost is low. The intuition is as follows. When the information production cost is high, there will be very little information
production in auctions. This is because investors will competitively bid against each other and there is very little profit for them to make. Anticipating this, investors have very little incentive to produce information in the first place. In contrast, when a fixed-price offering is used, entrepreneurs can optimally under-price and induce proper amount of information production. Although the proceeds from IPO will be lower, the secondary market price would be much higher for a high-value firm so that the combined proceeds from the IPO and the secondary market would be higher. Therefore, fixed-price offering is the optimal choice in this case. When the information production cost is low, there will be enough information production even when an IPO auction is used. Fixed-price offerings have no comparative advantage, and auctions are the optimal choice.

Our second result is that an entrepreneur would choose a fixed-price offering when he sells a small fraction of the firm in the IPO, and an auction when he sells a large fraction. The intuition here is as follows. When the entrepreneur sells a small fraction of the firm, he can choose a fixed-price offering and under-price in the IPO and induce investors to produce more information about the firm (therefore the secondary market price would be high). Since the combined proceeds come mainly from the secondary market in this case, a fixed-price offering is the optimal choice. In this case, if the high value firm uses an IPO auction, the IPO price would be higher but the secondary market price would be much lower since there will not be enough information production. In this case, the combined proceeds will be lower for the high value firm. In contrast, when the entrepreneur sells a large fraction of equity in the IPO, most proceeds come from the IPO. Auctions have the advantage of reflecting the information
gathered by investors in the offer price, therefore giving a higher-value firm a higher offer price. Thus, auctions are the equilibrium choice in this case.

The third result is that IPOs conducted by auctions will have much lower under-pricing compared to those conducted by fixed-price offerings. From the above two results we can see that fixed-price offerings will be used when greater information production by outsiders is desired, and the issuing firm needs to under-price more to compensate investors for this costly information gathering. Therefore, entrepreneurs choosing fixed-price offerings leave more money on the table to investors, and we observe that IPO auctions have less under-pricing than fixed-price offerings.

The fourth result is that the number of bidders in fixed-price offerings will be significantly larger than that in IPO auctions. The number of bidders is proportional to the amount of information produced by investors, which is in turn proportional to IPO under-pricing. Since under-pricing is larger in fixed-price offerings, a larger number of investors will participate in fixed-price offerings than in IPO auctions.

This paper generates several empirical implications. First, we predict that if a firm is young, or small, or faces a great extent of information asymmetry for some other reason (so that it is difficult for investors to evaluate the firm), then fixed-price offerings will be the equilibrium choice, since, in this case, considerations of inducing information production and their impact on the secondary market price become important. In contrast, if a firm is older, or larger, or has a well-known (reputable) product, or faces a lower level of information asymmetry for some other reason (so that investors’ cost of evaluating the firm is smaller), then our analysis implies that it will choose an IPO auction. Second, our model predicts that, everything else equal, entrepreneurs selling
smaller fractions of their firms' equity in the IPO will choose fixed-price offerings, while those selling larger fractions of their firms' equity will choose IPO auctions.

Third, our model predicts that IPO auctions will exhibit a significantly lower mean and variance of under-pricing compared to fixed-price offerings. This is due to the fact that the offer price in an auction aggregates the information produced by investors to a significant degree, so that the offer price is higher for higher value firms, and lower for lower value firms. In contrast, the offer price in a fixed-price offering is the same for high-value and low-value firm. The price jump (either upward or downward) from the IPO to the secondary market is therefore smaller for IPO auctions than for fixed-price offerings. Forth, we predict that the average number of bidders in the fixed-price offerings will be significantly larger than in IPO auctions.

Our model also has some policy implications. First, our analysis indicates the benefits of selling equity in tranches. If entrepreneurs sell their equity in the firm all at once, they may have to sell it at a very low price. Instead, they can choose to sell a small fraction of their equity in the first round, induce investors to produce information about their firm, and sell the remaining equity at a much higher price at a later stage. Second, our analysis indicates that existing IPO auction procedures may be reformed in several directions to make IPO auctions more competitive with fixed-price offerings. First, our analysis indicates that entrepreneurs may benefit from offering the IPO at a discount to the clearing price in the IPO auction. Second, this discount may be adjusted to account for the characteristics of firms going public: for instance, a greater discount may be offered in the IPOs of younger, smaller, or lesser-known firms. The idea is to
encourage greater information production by outsiders, over and above that "naturally occurring" in auctions.