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International Review of Economics and Finance 18 (2009) 81 – 109

International Review of Economics & Finance

www.elsevier.com/locate/iref

What determines the level of IPO gross spreads? Underwriter profits and the cost of going public ☆

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Received 27 December 2005; received in revised form 11 June 2007; accepted 13 June 2007
Available online 3 July 2007

Abstract

This paper addresses three empirical findings of the literature on initial public offerings. (i) Why do investment banks earn positive profits in a competitive market? (ii) Why do banks receive lower gross spreads in venture capitalist (VC) backed than in non-VC backed IPOs? (iii) Why is underpricing more pronounced in VC than in non-VC backed IPOs? While each phenomenon can be explained by itself, there is no explanation yet why all three occur simultaneously. We propose an integrated theoretical framework to address this issue. The IPO procedure is modeled as a two-stage signaling game: In the second stage banks set offer prices given their private information and the level of the spread. Issuing firms anticipate their bank's pricing decision and, in the first stage, set spreads to maximize expected revenue. Investors are aware of this process and subscribe only if their expected profits are non-negative. Firms' equilibrium spreads are large so as to induce banks to set high prices, allowing banks to make profits. Superiorly informed VC backed firms impose smaller spreads but face larger underpricing than non-VC backed firms.

JEL classification: G14; G24
Keywords: Initial public offering; Gross spread; Venture capital; Underpricing

1. Introduction

A large number of reputable institutions can administer initial public offerings. The under-writing industry should thus be highly competitive and profit margins should be low. Yet out of all investment banking fields, the IPO business is generally recognized to be among the most profitable. For an issuing firm (henceforth 'firm'), on the other hand, its first listing is usually a costly endeavor. While underpricing has been the focus of the literature, it is not the only cost of

☆ We thank seminar participants at the Spring Meeting of Young Economists (2003), the European Economic Association Meetings (2003), Copenhagen, and Munich. We thank Greg Jump, Carolyn Pitchik, Christian Schultz, Peter Sørensen, and Thomas Weber for valuable comments. We also thank the editor, Carl Chen, and two anonymous referees for useful comments. Andreas gratefully acknowledges financial support from the EU Commission (TMR grant number HPMT-GH-00-00046-08).
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doi:10.1016/j.iref.2007.06.006

going public.[1] The 'explicit' price tag is the discount – the gross spread – at which firms sell the shares to their underwriter (henceforth 'bank'), who then passes them on to investors at the public offer price.

The IPO market is plagued with various conflicts of interest and informational asymmetries between the parties involved, as is well-documented – both empirically and theoretically – in the literature on IPO underpricing.[2] Yet there is only little theoretical work[3] that assesses how these conflicts and informational asymmetries affect the gross spread level, and how the gross spread level and IPO pricing are interrelated. With this paper, we attempt to fill this gap.

What is known empirically about gross spread levels? Chen and Ritter (2000) find that spreads amount to 7% on average for a sample of 3203 IPOs between 1985 and 1998. They report that "investment bankers readily admit that the IPO business is very profitable" (p. 1105). Furthermore, spreads are not only *on average* but *exactly* 7% in most of the offerings. Hansen (2001) documents that this finding triggered 27 lawsuits and a U.S. Department of Justice investigation of "alleged conspiracy among securities underwriters to fix underwriting fees." Thus in practice, the spread level plays an important role, and it allows banks to generate substantial profits.

Notwithstanding the legal debate and empirical indications on investment bank collusion, our theoretical formulation allows a very different, subtle explanation for high spreads. We find that it can be in the best interest of the firm to pay 'high' spreads — even if a competing bank offered its service at a lower spread. Firms, therefore, do not bargain for lower spreads and banks do not compete in them.

Apart from the generally high level of spreads, there are also structural differences. Many IPOs are backed by a venture capitalist (VC). In their pioneering contribution on the role of VCs in IPOs, Megginson and Weiss (1991) compare VC backed and non-VC backed IPOs matched by industry and offer size between 1983 and 1987. They find that, on average, VC backed IPOs have lower spreads than non-VC backed IPOs. In a more recent study, Francis and Hasan (2001) confirm that VC backed IPOs are associated with less underwriter compensation than non-VC backed IPOs. However, they, and also Lee and Wahal (2004) and Loughran and Ritter (2004), find that VC backed IPOs exhibit larger average underpricing than non-VC backed IPOs.[4]

One obvious explanation for the first finding, i.e., that VC-backed firms face lower spreads, is that they are experienced, repeat players with a lot of bargaining power. But this does not explain the second empirical finding: why would an experienced player leave more money on the table and allow more underpricing than an inexperienced, non-VC firm? Appealing to 'experience' or 'repeated interaction' simply cannot explain why lower spreads and higher underpricing occur jointly. In our model, however, this arises as a natural result of the information revelation procedure in the offering process.

In the IPO process, there are three major players: the issuing firm, the bank, and investors. Each will react rationally to preceding actions by other players and/or in anticipation of a rational response. The only meaningful way to model this situation is as an extensive form game. Furthermore, in IPOs there is substantial uncertainty and thus it is reasonable to model asymmetric, noisy information that is correlated among agents. Finally, the aftermarket price should aggregate information that the offer price could not — why else would we often observe substantial price-jumps? The nature of the problem therefore requires a model that incorporates three-player strategic considerations coupled with informational asymmetries. We thus set up our model as a three-stage signaling game, in which market prices aggregate more information than do offer prices.

There are drawbacks to this approach: The analysis of any three-player game is intrinsically complex. However, complexity is a price worth paying: The model accomplishes to exactly integrate the above described stylized facts. In addition, we derive a novel, testable implication in that relationship-bank[5] backed IPOs should have the highest spreads.

In our model, we assume that banks, investors, and issuing firms (may) have private but noisy information about the intrinsic value of the offered security, which is either 'good news' or 'bad news'. In a wider sense, this signal can also be understood as information about how the market perceives the firm's fundamentals. Initially, the firm offers the bank a contract that specifies the gross spread level. If the firm is privately informed, the spread level can be either separating

[1] Ritter and Welch (2002), for example, report an average first-day return of 18.8 percent for 6249 IPOs in the U.S. between 1980 and 2001.
[2] Ljungqvist (2005) provides a comprehensive overview of the literature.
[3] Exceptions are Baron (1982) and Yeoman (2001), which we discuss below.
[4] These papers contrast earlier studies, e.g., Barry, Muscarella, Peavy, and Vetsuypens (1990) and Megginson and Weiss (1991) who found that VC backed IPOs are associated with less underpricing.
[5] A commercial bank with strong, long-lasting ties with the firm, for instance through credit-financing.