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# Underwriter networks, investor attention, and initial public offerings☆

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#### ABSTRACT

Using various centrality measures from social network analysis, we analyze how the location of a lead initial public offering (IPO) underwriter in its network of investment banks affects various IPO characteristics. We hypothesize that investment banking networks allow lead IPO underwriters to induce institutions to pay attention to the firms they take public and to perform two information-related roles during the IPO process: an information dissemination role, in which the lead underwriter uses its investment banking network to disseminate noisy information about various aspects of the IPO firm to institutional investors; and an information extraction role, in which the lead underwriter uses its investment banking network to extract information useful in pricing the IPO firm equity from institutional investors. Based on these two roles, we develop testable hypotheses relating lead IPO underwriter centrality to the IPO characteristics of firms they take public. We find that more central lead IPO underwriters are associated with larger absolute values of offer price revisions, greater IPO and after-market valuations, larger IPO initial returns, greater institutional investor equity holdings and analyst coverage immediately post-IPO, greater stock liquidity post-IPO, and better long-run stock returns. Using a hand-collected data set of pre-IPO media coverage as a proxy for investor attention, we show that an important channel through which more central lead IPO underwriters achieve favorable IPO characteristics is by attracting greater investor attention to the IPOs underwritten by them.

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#### 1. Introduction

Underwriting syndicates are information networks. The practitioner initial public offering (IPO) literature points to the two-way information flow occurring during IPO road shows and the book-building process between IPO underwriters and institutions. On the one hand, underwriters collect information about the demand schedule of institutional investors for the IPO firm's shares. On the other hand, they address institutions' questions and concerns about the future strategy and performance of the IPO firm, thus disseminating information about the firm to them. The network of investment banks that a lead IPO

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underwriter is connected to (through participation in various IPO underwriting syndicates) can play a crucial role in the information extraction and information dissemination that occurs during the IPO underwriting process.

The objective of this paper is to analyze how the central position of a lead IPO underwriter in a network of investment banks affects various IPO characteristics of the firms it takes public. By making use of data on the interactions between investment banks serving as part of underwriting syndicates for different IPOs, we are able to use measures from social network analysis (SNA) to characterize the relative position of each underwriter in the network of investment banks developed as a result of such interactions. We then empirically analyze how these measures of network centrality of lead IPO underwriters relate to the characteristics of the IPOs underwritten by them.

We measure the relative position of the lead IPO underwriter in the network of investment banks by making use of six different centrality measures that are widely used in the SNA literature. The first measure is *Degree*, which is the number of other unique investment banks that the lead IPO underwriter had connections with (either as a lead IPO underwriter or as a member of an IPO syndicate) in the five-year period prior to the IPO year. The other measures of lead IPO underwriter centrality that we use are *Outdegree*, *Indegree*, *Eigenvector*, *Betweenness*, and 2-StepReach. We define and discuss in detail these six measures of lead IPO underwriter centrality and illustrate them using a real-world investment banking network (shown in Fig. 2) in Section 5.1.

Precisely how can a more central location of a lead IPO underwriter in an investment banking network affect the characteristics of IPOs underwritten by it? To answer this question, consider a lead IPO underwriter connected to a number of other investment banks through repeated participation in IPO syndicates and whose position in this investment banking network is captured by the SNA measures. Let each investment bank in the network also be connected to a number of institutional investors through repeated prior interactions. In such a setting, we can think of two ways in which a lead IPO underwriter's position in its network of investment banks can affect the characteristics of IPOs it is underwriting. First, the location of a lead IPO underwriter in its investment banking network can affect its ability to attract attention from institutional investors to the firm it is taking public using this network and to disseminate information about the IPO firm to these institutional investors. Second, this location can affect the lead IPO underwriter's ability to extract information from institutions about their demand for the IPO firm's equity after it attracts the attention of these institutions to the IPO firm.

We first discuss how lead IPO underwriter's centrality can affect its ability to attract attention from institutions to the firm it takes public and to disseminate information about the IPO firm to these institutions. The certification literature has argued that the role of an IPO underwriter is that of a producer of noisy information about various aspects of the firm it takes public and a transmitter of that information to potential investors in its IPO; see, e.g., Booth and Smith (1986) or Chemmanur and Ful-

ghieri (1994). However, unlike this literature, which has argued that a lead underwriter transmits information about the IPO using its reputation as a certification mechanism, we postulate that the lead underwriter disseminates noisy information about various characteristics of the IPO firm to potential investors through the network of investment banks connected to it, with each investment bank having repeated interactions with a set of institutions that may potentially invest in the IPO. We further assume that, for investors to consider investing in an IPO, they need to pay attention to that IPO. In other words, they need not only to receive information about the IPO firm, but also to pay attention to or recognize this information.

The last assumption is in the spirit of the Merton (1987) "investor recognition" or "attention" model, which assumes that an investor will incorporate a security into his portfolio only if he pays attention to that security. The Merton (1987) model has been extended by Van Nieuwerburgh and Veldkamp (2009), who assume that such attention/information acquisition has a cost; see also the theoretical model in Liu, Lu, Sherman, and Zhang (2014), who model IPO underpricing as a way of compensating investors for this attention cost. We make a similar assumption about investors having to incur such an attention/information acquisition cost. We further assume that this cost is lowest when information about various aspects of a particular IPO is brought to the investor's attention by an investment bank with which it has had repeated prior interactions. Given that it can be prohibitively costly to acquire this information from other investment banks, the last assumption implies that an institution is more likely to pay attention to information about (and therefore invest in) a particular IPO if it receives this information from an investment bank with which it had repeated prior interactions.

The above theory has an important implication for information dissemination and investor attention. The implication is that a more central lead underwriter will be connected to a greater number of institutions (through the investment banks in its network), allowing it to induce a larger number of institutions to pay attention to the firm it takes public, thereby facilitating more efficient dissemination of information about the firm to these institutions. We refer to the above hypothesis as the "investor attention and information dissemination" hypothesis.<sup>1</sup>

The network centrality of a lead IPO underwriter can also affect its ability to extract information from institutions about their demand for the IPO firm's equity after it attracts the attention of these institutions to the firm. The theoretical book-building literature that originated with

<sup>&</sup>lt;sup>1</sup> The information dissemination we have in mind is noisy information about various characteristics of the firm going public, not favorable information about its intrinsic value. Therefore, while some institutional investors who pay attention may choose to invest in the equity of the IPO firm after they conduct their own valuation of the firm, others may decide not to invest in its equity at the IPO offer price chosen by the lead underwriter. However, for a given IPO firm, the larger the number of institutions paying attention to the information conveyed to them about the firm by the lead IPO underwriter through the network of investment banks it is connected to, the greater the expected number of institutions investing in its equity (for a given IPO offer price).

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