# Underwriter-Issuer Social Ties and IPO Outcomes

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**Abstract**

We examine the role of social ties in IPO underwriting syndicate formation. An investment bank is more likely to be included in the underwriting syndicate—as a book manager, co-manager, or non-managing syndicate member—when it is connected to the IPO firm through interpersonal social ties between the respective executives and directors. The investment bank further benefits from its social ties by receiving higher compensation and better share allocation in the IPO. A *quid pro quo* arrangement is in place, as, for the IPO firm, the presence of social ties between the IPO issuer and the chosen underwriters is associated with wealth gains for its pre-IPO shareholders.

JEL Classifications: G24, G32

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## 1. Introduction

*"…In the clubby world of Silicon Valley, where personal relationships often drive business ties, Facebook finance chief David Ebersman relied on Mr. Grimes for advice during the IPO process…"* [Michael Grimes is the co-head of global technology at Morgan Stanley, the lead underwriter in the Facebook IPO].

The Wall Street Journal (May 25th, 2012)

IPO underwriting is a lucrative business and investment banks compete fiercely to participate in IPO underwriting syndicates. Thomson Reuters reports that in the period 2000-2009 nearly $500 billion were raised through initial public offerings (IPOs) in the United States. Many attributes can drive the level of a bank's participation in this business. Extant literature recognizes some of these attributes, such as the investment bank's reputation (Corwin and Schultz, 2005), a promise to provide sell-side coverage (Dunbar, 2000), and past lending relationships between the bank and the issuer (Bharath, Dahiya, Saunders and Srinivasan, 2007). As the *Wall Street Journal* quote at the top of the page suggests, personal relationships may be another attribute. We test this possibility by examining the role of interpersonal social ties (henceforth "social ties") between investment banks and issuers in determining the composition and characteristics of IPO underwriting syndicates.

There are multiple reasons why social ties could matter in the formation of IPO syndicates. One idea is that social ties help improve the quality of the underwriting syndicate. For example, prior literature has shown social ties functioning as efficient conduits for information flow in many other business exchange settings.[1] Bringing a "friend" to the table may also alleviate moral hazard problems and foster cohesiveness in the syndicate (Corwin and Shultz, 2005). Therefore issuers are more likely to pick investment banks with whom they are socially connected as book managers in forming the IPO syndicate. The expectation in each case would be of a more coordinated and better functioning underwriting syndicate, and presumably more favorable IPO outcomes for the parties involved in the social connection. We label this the *quid pro quo* hypothesis.

[1] For extensive discussion on the effects of social ties on information flow between the connected parties in different business exchange settings, see Cohen, Frazzini, and Malloy (2008, 2010), Hochberg, Ljungqvist, and Lu (2007), Engelberg, Gao, and Parsons (2012), and Cai, Walkling, and Yang (2015).

Alternatively, social ties may merely be used as a channel for familiarity, loyalty, or as an artifice to reduce the search costs associated with too many alternatives. Podolny (1994) argues that in the presence of information asymmetry, the parties involved in an exchange "…shift their orientation from what is exchanged to the social structural positions of their exchange partners, where position is defined by an actor's previous pattern of exchange relations" (page 459). Consistent with Podolny (1994), there is a body of literature that stresses the importance of social ties in the determination of exchange relations under market uncertainty and argues that managerial decisions are often based on personal experience due to cognitive constraints and information search costs. That is, a possible response to uncertainty is a "satisficing" search which is limited to first choosing from within a subset of potential partners one is most familiar with. For example, when examining the mutual funds' advisory choice Kuhnen (2009) posits that "…directors may hire a known advisor simply because it is too costly to search for the best alternative among all the possible candidates" (page 2187). Similarly, Huberman (2001) examines the behavior of exchange parties and concludes that there is compelling evidence that people invest in the familiar and that their investment behavior is often inconsistent with the tenets of portfolio theory.[2]

In such a case, the presence of social ties is an attribute that by itself facilitates an underwriter's inclusion in the IPO syndicate, and there may be no expectation of a *quid pro quo* from the issuer or from the underwriter. The implication is that the presence of social ties as a determinant of the participation in the IPO underwriting syndicate is complementary to the various attributes examined in the extant literature. To illustrate this intuition, suppose three investment banks are chosen to participate in an IPO underwriting syndicate, each due to a different reason. Underwriter *A* is chosen because of its high reputation ranking, underwriter *B* because of the social ties to the issuer, and underwriter *C* due to the expectation that it will produce a better outcome—say by generating more interest in the issue.

[2] Cohen (2009) investigates another possible aspect of personal relations. The information-based explanation of employee investment in their company is that employees have superior positive information about their own firm relative to other investors and are, therefore, willing to purchase a large percentage of their company stock. However, Cohen (2009) refutes the superior information story, showing instead that employees display traits of loyalty to their personal economic detriment; they exhibit questionable asset allocation and invest in their own company stocks, consistent with loyalty and inconsistent with a risk-diversification motive.

Complementarity implies that social ties influence the selection of *B*, without any expectation that *B* will perform better than *C* with respect to the IPO outcomes. We label this the *familiarity* hypothesis.

We start by examining whether the presence of social ties drive the formation of an IPO syndicate. As in Engelberg, Gao, and Parsons (2012), we measure social ties between two firms based on linkages among their executives and directors. These links may be established by relationships formed through overlapping periods in past employment or education background predating the IPO date. We employ a sample of 1,530 U.S. firms that went public in the period 2000-2009, and find that, controlling for other determinants of IPO syndicate formation, the presence of social ties between an investment bank and the issuer increases the likelihood that the bank is chosen to participate in the IPO syndicate—either as a book manager, a co-manager, or a non-managing syndicate member. The effects are economically significant. For example, *ceteris paribus* the odds of becoming the book manager increase by 42% when the investment bank has social ties with the IPO firm. We can also quantify the effect in terms of probabilities: Among the 20 most prominent eligible underwriters, an investment bank having social ties with the issuer sees the probability of becoming a book manager increase from 5.7% to 7.9%.

The evidence that social ties matter for the selection of the IPO syndicate is consistent with both the *familiarity* and the *quid pro quo* hypotheses. However, these hypotheses provide different predictions for the impact of social ties in shaping outcomes associated with an IPO. While the *familiarity* hypothesis implies no differential economic outcomes beyond the choice of which banks will be included in the underwriting syndicate, the *quid pro quo* hypothesis anticipates that both parties—the underwriter and the IPO issuer—involved in the social ties can benefit from the underwriting choice. To distinguish between these hypotheses, we explore the role of social ties by focusing on IPO outcomes deemed valuable to the socially connected parties.

We first analyze outcomes that may benefit underwriters. Obviously, participation in the IPO's underwriting syndicate is already a positive outcome for an underwriter, so here we ask whether underwriters extract benefits from their social ties that go *beyond* syndicate participation. We start by examining the chosen banks' role within the underwriting syndicate. We show that, conditional on being

part of the underwriting syndicate, the presence of social ties with the issuer makes the underwriter more likely to "move up the ladder" to a more senior position in the syndicate. Having a more senior role in the IPO, especially serving as book manager rather than a co-manager or non-manager, should translate to not only greater direct and indirect income from the IPO itself (Chen and Ritter, 2000), but should also have lasting future benefits as the bank can build on its reputational capital associated with its ability to successfully take new firms public.

Next we examine share allocation in the IPO, an important prize for underwriters (Corwin and Schultz, 2005). We show that, among the chosen underwriters, other things equal, the number of shares allocated to an underwriter significantly increases by 23% when the underwriter has social ties with the IPO issuer. Since share allocation is primarily determined by role (i.e., book managers, on average, are allocated more shares than co-managers, who are allocated more shares, on average, than non-managers), we examine the competition for share allocation among players both across participation roles and within the same participation role. Given that variation in share allocation among book managers or among co-managers is rare, we limit our within participation role analysis to the participants in a non-managing syndicate role. We find that social ties matter: having ties to the issuer helps the underwriter enjoy a share allocation that is 8% higher than the average allocation among the non-managing syndicate members in the same IPO.

While a more prestigious role and greater share allocation are both important benefits to underwriters with social ties, a more direct test of the *quid pro quo* hypothesis is to examine the dollar compensation for the underwriters' efforts. Following Cook, Kieschnick, and Van Ness (2006), we look at both the total dollar compensation paid to the underwriters by the IPO issuer (dollar gross spread) and the portion of compensation paid for selling the issue (selling concession). We show that, consistent with the *quid pro quo* hypothesis, both the dollar gross spread and selling concession are positively correlated with the presence of social ties between the book manager(s) and the issuer. Other things equal, such ties are associated with an increase of 7% (9%) in dollar gross spread (selling concession) flowing to the underwriters.

We next turn to IPO outcomes that matter to issuers. Given the preferential treatment offered to underwriters with social ties to the issuer, it is fair to ask whether these underwriters "return the favor" and provide IPO outcomes that benefit the issuers. We focus on valuation outcomes and consider three measures: offer price revision, initial IPO returns, and pre-issue shareholder net wealth gains from the IPO. We start with offer price revision. To the extent that a higher offer price implies more capital to the issuer, the *quid pro quo* hypothesis suggests that the presence of social ties between the issuer and the book manager(s) should be associated with an increase in offer price from the initial filing range. That increase may come, for example, from heightened promotion efforts by underwriters (Cook et al., 2006). On the other hand, social ties may reduce the information asymmetry between issuer and underwriters, leading to a more accurate initial filing price to begin with, and thus resulting in a smaller absolute revision in the offer price. We show that the first effect prevails: the likelihood of an upward move in the offer price from the initial filing range increases in the presence of social ties between the issuer and the book manager(s).

Arguably, one of the most watched outcomes in an IPO is its initial (first-day) returns. However, there is no clear prediction under the *quid pro quo* hypothesis regarding the relation between initial returns and the inclusion of a socially-connected book manager in the underwriting syndicate. On the one hand, a higher initial return is often taken as a measure of success of the IPO process—e.g., the result of a more successful marketing effort by underwriters (Krigman, Shaw, and Womack, 2001). On the other hand, higher initial returns mean more money "left at the table", thus suggesting a negative outcome from the perspective of issuer. In addition, if the presence of social ties is associated with a reduced level of information asymmetry, which yields more accurate pricing, it may be associated with lower initial returns (Rock, 1986). Perhaps attesting to the conflicting objectives, we do not find a robust relation between an IPO's initial returns and whether social ties exist between the issuer and the book manager(s).

A more comprehensive measure of what matters to the issuer, particularly its pre-issue shareholders, is the net gain or loss from the IPO. Loughran and Ritter (2002) and Bradley and Jordan (2002) point out that pre-issue shareholders benefit from the difference between the after-market price

and the midpoint of the IPO's initial filing range for the portion of shares they retain (the "wealth" effect), but they lose from the difference between the after-market price and the offer price for the portion of shares sold during the IPO process (the "dilution" effect). Thus, to determine the overall effect of IPO initial returns and offer price revisions on pre-issue shareholders, one must examine the net gain—the wealth effect minus the dilution effect. Since these pre-issue shareholders are often the IPO's decision makers, they may hire underwriters with social ties in the expectation that these underwriters "return the favor" by expending effort which would yield a net gain from the IPO process for the decision makers. To test this *quid pro quo* implication, we follow Cook et al. (2006) and analyze instances where wealth gains surpass the dilution effects. We show that, other things equal, the presence of social ties between the issuer and the book manager(s) is associated with increased likelihood that pre-issue shareholders' wealth effects are greater than the dilution effects.

Overall, our results are consistent with prior personal social relations acting as the basis for a business exchange. A *quid pro quo* arrangement, rather than simply loyalty or familiarity, is the reason for including a particular investment bank in an IPO underwriting. Benefits from the presence of social ties between underwriters and IPO issuers flow both ways. Underwriters with social ties to the IPO issuer are more likely to be included in the IPO syndicate, and, when they do become part of the syndicate, they are paid more and receive a higher share allocation. For the issuer, we show that its pre-issue shareholders benefit from the arrangement by capturing a net wealth gain from the IPO.

Prior literature has identified several attributes that determine the formation of an IPO syndicate. We contribute by adding to this list an intuitively appealing attribute that has not been previously documented. Our finding that social ties influence the inclusion of a bank in an IPO syndicate is consistent with personal relations impacting the formation of business ties in other finance settings. Kuhnen (2009) documents that mutual funds' choice of sub-advisors, from within a pool of likely candidates, is strongly influenced by past business ties. Social ties drive how venture capital firms syndicate a deal (Bhagwat, 2013). Cohen, Frazzini and Malloy (2008) find that portfolio managers place larger bets on stocks of "connected" boards. Fracassi and Tate (2012) show that social ties between

management and prospective directors drive the selection of board members. In the context of IPOs, Corwin and Schultz (2005) conjecture, but do not test, whether personal relations between the prospective issuer and an investment bank can be a reason why any specific bank is included in the IPO's underwriting syndicate.

We show that ties formed through educational experience, as well as overlapping employment experience at the personal level, help in the investment banks' ability to secure underwriting business. Such ties help them get a seat at the table and in securing a better compensation structure and a larger piece of the underwriting pie. In return, the issuing firm's pre-issue shareholders are more likely to receive a net gain in the IPO. These findings are related to Engelberg, Gao, and Parsons (2013), who show that CEOs are paid for their social networks, even though the precise channels of value creation are not clear. Our results help to identify one such channel through which the executives and directors' social network creates value for investment banks.

The paper proceeds as follows. Section 2 describes the data. Section 3 examines the role of social ties in the formation of the IPO underwriting syndicates. Section 4 examines outcomes from the IPO process and whether they are shaped by the presence of social ties. Section 5 concludes.

## 2. Data

The data combine information from a number of sources. Our initial sample consists of all IPOs from 2000-2009 from Thomson Financial's SDC new issues database. We manually collect the underwriting syndicate information from IPOs' prospectus.[3] We use only IPO firms domiciled in U.S. that are listed on CRSP and Compustat databases, and exclude unit offerings, REITs, closed-end funds, and IPOs in which we cannot collect information on social ties (described below). This results in a final sample of 1,530 IPOs. We further collect the IPO firms' financial and accounting variables using the

[3] We rely on the hand-collected data from the original prospectus filed with the U.S. Securities and Exchange Commission (SEC) due to errors found in Thomson Financial's SDC database. Namely, SDC frequently excludes banks actually present in an underwriting syndicate and sometimes includes banks that are not. In addition, errors are sometimes found in the bank's role in the offering (e.g., whether the bank is a co-manager or non-manager) and the number of shares underwritten by the bank.

CRSP and Compustat databases.

We construct proxies for the interpersonal social connections among executives and directors at two different firms based on these individuals' biographical information provided by Management Diagnostic Limited's *BoardEx* database. *BoardEx* contains the employment history, education backgrounds, and the current affiliation with social organizations for senior executives and board members of over 14,000 U.S. and European public and private companies starting in 2000. *BoardEx* data have been used in a number of recent social network studies (e.g., Cohen, Fazzini, and Malloy, 2008, 2010; Engelberg, Gao, Parson, 2012, 2013; Fracassi and Tate, 2012; Gompers, Mukharlyamov, and Xuan, 2012; Ishii and Xuan, 2013 and Cai, Walkling, and Yang, 2015).

We collect data regarding sell-side coverage of IPO firms from IBES. The provision of sell-side coverage is proxied by the presence of an analyst's recommendation on the IPO firm. We identify all-star analysts by examining the *Institutional Investor* magazine for the period 1999-2009. All-star rankings are established at the industry level. We match all-star analysts and IPO firms based on the industry classification defined by the General Industry Classification Standard (GICS). GICS is widely adopted by investment banks as an industry classification system (as opposed to the SIC classification that is popular among academics). We obtain the GICS for each IPO firm from Compustat, and we hand-match the GICS industry names with the industry names used by the *Institutional Investor*.

We construct proxies for lending relationship between the IPO firm and a financial institution based on the loans that the firm has obtained prior to the IPO and that had the financial institution as the lead arranger. We obtain data on loans from the Loan Pricing Corporation's (LPC) Dealscan database. We match the borrowers in the LPC database with the sample of IPO firms using the link originated in Chava and Roberts (2008).

We manually match the identities of financial institutions in their different roles—as underwriters (data from Prospectus), sell-side brokers (data from IBES), and lenders (data from LPC). A special challenge arises from the many mergers involving financial institutions during our sample period. We identify such mergers using different sources. We start with the data provided by prior papers that have

dealt with mergers involving financial institutions: Hong and Kacperczyk (2010), Corwin and Schultz (2005), and Bao and Edmans (2011). We extend this initial sample by searching on IBES for brokerage firms that have disappeared during our sample period. For each such brokerage firm, we look for press releases and news articles from Factiva to confirm whether it has participated in a merger. Finally, we complement the data by searching—as described in Hong and Kacperczyk (2010)—directly for mergers involving financial institutions using the SDC Mergers and Acquisitions database.

## 3. The Formation of Underwriting Syndicates

In this section we analyze the role of social connections on the formation of underwriting syndicates. We merge a new and growing literature that examines the role of managerial social ties on firm's financial decisions, to the existing literature on the determinants of IPO underwriting syndicate formation. Of particular importance is the work by Corwin and Schultz (2005), who first analyze the choice of the underwriters for the roles of co-managers and non-managing syndicate members in an IPO deal. We extend their approach to account for the social ties as a determinant of IPO syndicate formation and to model the choice of the IPO book managers. We start with a logistic model to determine the likelihood that an investment bank will be included in the IPO underwriting syndicate. We then run separate models for the choice that reflects the particular role held by the underwriter: book managers, co-managers, and other non-managing syndicate members.

For the choice of whether an underwriter becomes part of the IPO syndicate, the model takes the form:

$$\Pr(UWR_{i,j} \text{ is included in the underwriting syndicate}) = f(Social\ ties\ to\ issuer_{i,j}, X_i, Y_j, Z_{i,j}), \quad (1)$$

where $UWR_{i,j}$ identifies an eligible underwriter $j$ for an IPO $i$. The sample of eligible underwriters for an IPO includes all investment banks that were active in the equity underwriting business at the time of the

IPO date.[4] We consider a bank as active if it participated in at least one underwriting syndicate within five years preceding the IPO date and had not been shut down at the time of the IPO—due to a merger of financial institutions or as a result of bankruptcy. The main variable of interest is the presence of social ties between the underwriter *j* and the IPO firm *i*. The model also emphasizes the need to control for other determinants of the choice of underwriter, at the level of the IPO firm ($X_i$), the underwriter ($Y_j$) or, like the measure of social ties, at the pairing of IPO firm and underwriter ($Z_{i,j}$).

For the choice of book manager, the model controls for determinants of the choice of book manager similar to those specified in model (1). We, therefore, use the following model for the choice of book manager:

$$\Pr(UWR_{i,j} \text{ is book}) = f(\textit{Social ties to issuer}_{i,j}, X_i, Y_j, Z_{i,j}), \quad (2)$$

For the choice of co-manager, we extend the set of control variable of models (1) and (2) to also include a proxy for the presence of social ties between the eligible underwriter and chosen book manager(s) for the specific IPO under analysis. We also allow for variables that relate each eligible underwriter to the chosen book manager(s) of the IPO being considered ($V_{i,j}$). The sample of eligible underwriters is slightly reduced, since an underwriter that was already chosen as book manager for the IPO cannot be further chosen as a co-manager for the same IPO. More specifically, we use the following model for the choice of co-managers:

$$\Pr(UWR_{i,j} \text{ is co-manager}) = f(\textit{Social ties to issuer}_{i,j}, \textit{Social ties to book}_{i,j}, X_i, Y_j, Z_{i,j}, V_{i,j}). \quad (3)$$

The model in equation (3) assumes a hierarchical process, consistent with the approach taken in Corwin and Schultz (2005). The syndicate formation starts with the selection of the book manager(s), and, once this selection is made, the choice of co-managers takes place from the pool of remaining eligible underwriters. We assume that co-managers are chosen with the input of both the issuer and the book manager(s) selected to lead the IPO syndicate—thus, social ties between the eligible underwriters and the chosen book manager(s) may play a role in the process.

[4] Since interpersonal connections can be measured only for firms with BoardEx representation, we require an underwriter to have coverage on BoardEx before it is considered eligible. We also restrict our sample to IPO firms with representation in the BoardEx database. As already mentioned, this yields a final sample of 1,530 IPO firms.

Finally, we model the choice of non-managing syndicate members (hereafter "syndicate" member) in a manner similar to model (3). For simplicity, we also assume a hierarchical process whereby eligible underwriters compete for the co-manager roles, and once this choice is made, the remaining underwriters compete for the role of a syndicate member. Therefore, the sample of eligible underwriters for the role of syndicate member in an IPO excludes the underwriters that were chosen for the role of book manager or co-manager in the IPO. The model for syndicate members is:

$$\Pr(UWR_{i,j} \text{ in syndicate}) = f(\textit{Social ties to the issuer}_{i,j}, \textit{Social ties to book}_{i,j}, X_i, Y_j, Z_{i,j}, V_{i,j}). \quad (4)$$

Table 1 provides summary statistics for our sample of IPOs. Given that *BoardEx* data is available starting in 1999, we limit our sample of IPOs to the period 2000-2009. The average IPO raised $239 million, with an average (median) underpricing of 22.04% (7.86%). The average price revision (percentage return from the midpoint of the original filing range to the offer price) is 0.5%. Gross spread and selling concession are $12.43 million and $6.78 million, on average, respectively. 44% of IPOs are venture backed (VC) backed with 26% coming from high-tech industries. The average age of our sample of IPO firms is 16.7 years and the average of the ratio of the number of shares issued to number of shares outstanding ("float") is 32.1%. After accounting for mergers among financial institutions, the IPOs in our sample face an average of 272 eligible underwriters from which to pick their book managers, co-managers and syndicate members—and they end up with an average of 1.5 book managers, 3 co-managers, and 4.7 syndicate members per IPO. The book managers underwrite 58% of the shares of the offering, with co-managers taking 37% and syndicate members getting 6% of the pie.

### *3.1 Measures of Interpersonal Social Ties*

Our main explanatory variables refer to the presence of social ties between two firms—either between the IPO firm and an investment bank or between two investment banks. Following Engelberg, Gao, and Parsons (2012), we measure the social ties between two firms' executives and directors based on relationships formed through their overlap in past employment and/or education background predating the announcement the IPO. In particular, we identify two individuals as connected if any of the following

conditions applies: (1) the two individuals graduate from the same educational institution within 2 years of each other, or (2) the two individuals overlap through work as either executives or board members at a third party company not involving either of the two firms of interest. Furthermore, the education or employment overlap must happen at least five years prior to the IPO date. As in Engelberg et al. (2012), this last requirement alleviates concerns about reverse causality—e.g., as a result of being included in a syndicate, an underwriter may reward an executive at the IPO firm with a board seat in a third party company where one of its executives also has a seat.

Table 2 presents summary statistics for the eligible underwriters in each IPO. The first column presents information for all eligible underwriters chosen to be a member of the IPO underwriting syndicate. In the next four columns, we break down the sample of eligible underwriters between underwriters that are chosen as book managers, co-managers, syndicate members, and the remaining underwriters (i.e., eligible underwriters not chosen as a book, co-manager, or syndicate member). The social tie measures are computed at the level of each underwriter. For example, a mean value of 16.08 for the measure of the *social ties to issuer* for the sample of book managers indicates that 16.08% of the underwriters chosen as book managers had a social tie with the IPO firm by the time the IPO took place. Social ties to the issuer become less prevalent as we decrease the importance of the syndicate participation—with 9.09% of co-managers, 4.72% of syndicate members, and only 1.97% of other eligible underwriters having such ties. These univariate results show that an underwriter's social ties to the issuer are positively correlated with their selection as a book, co-manager, or syndicate member.

Given the hierarchical nature of the underwriting syndicate formation process, we assume the book managers play a role in choosing the co-managers and non-managing syndicate members. Therefore, we also examine social ties among underwriting investment banks. For the IPOs with more than one book manager, we consider an underwriter to have *social ties to book* if the underwriter has social ties to at least one of the book managers of the IPO. Since underwriters operate in the same industry, it is not surprising that social ties between underwriters are much more common than those between an underwriter and the IPO firm. For example, 53.47% of the underwriters chosen as co-

managers share a social tie with the IPO's book manager(s). Among the chosen syndicate members, 27.53% of the underwriters present such ties. Finally, only 12.8% of the remaining underwriters present a tie to the IPO's book manager(s). Again, this result shows that social ties with the book manager(s) are positively correlated with an underwriter's selection as a co-manager or a syndicate member.

An obvious concern about the data on social ties is whether there is enough variability in the measure across all eligible underwriters. It is possible that such connections are constrained to a small sample of top players in the underwriting market—e.g., Goldman Sachs, Morgan Stanley, Citigroup, etc. Untabulated statistics suggest that this is not the case. There are 173 different underwriters in our sample with connections to at least one IPO firm—with an average (median) number of IPO firms connected to each underwriter equal to 45 (15). Regarding social ties among underwriters, there are 3,011 different pairs of underwriters—involving 193 different underwriters—with a connection at some point during our sample period. For these 193 underwriters, the average (median) number of underwriters with which they have some connection is 30 (20). In summary, the set of connections in our sample does not seem to be driven by a small number of dominant banks.

*3.2 Other Determinants of Syndicate Participation*

Models (1) through (4) need to control for other determinants of syndicate participation by an underwriter. Corwin and Schultz (2005) show that bigger IPOs are better able to accommodate more co-managers and syndicate members. Accordingly, we include (the log of) the offer proceeds as a control variable in our choice models. Corwin and Schultz also show that highly ranked underwriters are more likely to be chosen as co-managers and syndicate members. We postulate that this certification effect should also play a role in the choice of book managers. Thus, we include the Carter-Manaster underwriter reputation rank in the three models.[5]

Bharath, Dahiya, Saunders, and Srinivasan (2007) show that the presence of a lending relationship, between an underwriter and the IPO firm, makes it more likely for the underwriter to be

[5] The Carter-Manaster underwriter rank (and the updated Carter-Manaster rank from Loughran and Ritter, 2004) is obtained from Jay Ritter's website: http://bear.warrington.ufl.edu/ritter/ipodata.htm.

chosen as book manager. As in Bharath et al. (2007), we record the presence of a lending relationship as a dummy that is equal to one if, at any point in the five-year period preceding the IPO date, there was a loan for the IPO firm for which the underwriter was a lead arranger. We hypothesize that the same dynamics will play a role in the choice of a co-manager and syndicate member.

There is ample anecdotal as well as academic evidence that research coverage is an important service that an underwriter can provide (e.g., Bradley, Jordan and Ritter, 2003 and 2008; Cliff and Denis, 2004; Corwin and Schultz, 2005; Degeorge, Derrien and Womack, 2007; Dunbar, 2000; Loughran and Ritter, 2004). We analyze the importance of sell-side research as an attribute of an eligible underwriter through two variables. The first indicates whether the underwriter is a sell-side research provider—it is a dummy that equals one if the research division of the underwriting firm has issued at least one recommendation for any firm in the year preceding the IPO date. The second variable, from Corwin and Schultz (2005), is an indicator of whether the research division of the underwriting firm employs one of the top three analysts (an all-star analyst) for the IPO firm's industry, according to the *Institutional Investor* magazine ranking from the year prior to the IPO date.

Geographic location can also be an attribute that influences the choice of underwriters, for at least two reasons. Including underwriters in certain geographic locations can increase the potential client base (e.g., when choosing a co-manager, one can expand the base by having a co-manager that is not located in the same state as the book manager). Informational advantages can also arise due to the geographic proximity between a financial institution and a firm (e.g., Malloy, 2005; Anand et al., 2011). Hence an underwriter closer to the issuing firm could be a valuable asset to have in a syndicate. We thus include variables tracking the geographical location of eligible underwriters, to ascertain whether the underwriter is located in the same state as, or the state adjacent to, the issuer (and/or to the book manager).

Even as we include the aforementioned underwriter's characteristics in our model, these characteristics might not be enough to clearly describe the underwriter's overall attractiveness for a specific role. The concern is that each underwriter can have its own niche in terms of being involved in IPOs as a book manager, co-manager or syndicate member. The Carter-Manaster rank certainly helps in

this regard, as more highly-ranked underwriters will be relatively more frequently involved as book managers. However, other characteristics—some observable, others potentially not—can also drive the likelihood of an underwriter being chosen for each syndicate role. We summarize this likelihood by the strength of each underwriter, as measured by its past participation in IPO syndicates in the role of book manager, co-manager or syndicate member. More specifically, for an IPO's eligible underwriters, we define the underwriter's past role as book manager as the fraction of IPOs, in the 20 calendar quarters proceeding the IPO's calendar quarter, which had that specific underwriter in the book manager's role. We define similar measures for an underwriter's past role as co-manager and as non-managing syndicate member.[6]

Table 2 presents summary statistics for the potential determinants of the allocation of underwriters to the different roles in an IPO syndicate. We observe a monotonic pattern in most examined variables as we go from the non-chosen underwriters, to the chosen syndicate members, then co-managers, and finally to book managers. Relatively more relevant roles in the syndicate come with the presence of a lending relationship with the issuer, higher underwriter reputation rank, the nature of being a sell-side research provider, having an all-star analyst in the same industry as the IPO firm, and having a larger market share of IPO syndicates in the recent past. On the other hand, no clear pattern arises between geographic location and syndicate participation.

### *3.3 Regression Results*

#### *3.3.1 Main Results*

We now estimate the logistic models for the choice of IPO underwriters, in order to verify that social ties are still relevant after controlling for other observable determinants of syndicate participation. Besides the control variables discussed above, we add a proxy for IPO waves—the total number of firms that went public during the 180 calendar days prior to the IPO's filing date using our sample selection

[6] Corwin and Schultz (2005) address this possibility by arguing that issuers choose syndicate members from the pool of potential book managers, thus including as a control variable the *ex ante* probability that the underwriter is chosen as a book manager for the IPO. Given that this *ex ante* variable is computed using the full sample of IPOs, it carries a forward-looking bias. We avoid this approach since we want to keep the predictive nature of our choice models.

criteria (Bauguess, Cooney, and Hanley, 2014). Table 3 presents the results.

Column (1) shows the results for the selection of underwriters into the IPO underwriting syndicate without regard to role. Several attributes at the underwriter level are relevant in this selection. An underwriter is more likely to be included into the underwriting syndicate if: (i) it has a lending relationship with the issuer; (ii) it has a Carter-Manaster underwriter reputation rank above 8; (iii) it is also a sell-side research provider; and (iv) it employs an all-star analyst in the industry to which the IPO firm belongs. Geography matters: an underwriter located in the same state or adjacent state as the IPO firm is more likely to participate in the underwriting syndicate. The strength of an underwriter, proxied by its participation rate—either in the role of a book manager, co-manager, or non-managing syndicate member—of recent IPOs, is an important determinant of participation in the current IPO. We also observe that higher IPO proceeds increase the likelihood of *any* underwriter being chosen, consistent with the idea that larger offers may have more underwriters. The same effect is found with our variable tracking IPO waves—a more active IPO market increases the likelihood of *any* underwriter being chosen. Finally, in the multivariate setting, we confirm the importance of social ties with the issuer in the choice of the underwriters: the *social ties to issuer* coefficient is highly significant ($p$-value<0.0001).

We next separately examine the selection of underwriters for roles of different ranks within the IPO underwriting syndicate. Column (2) in Table 3 shows the results for the selection of book managers. All the underwriter's attributes that matter for the general syndicate formation choices are relevant to the choice of book managers except for location in an adjacent state and the IPO wave variable. Most importantly, an underwriter is more likely to be chosen as book manager if it shares social ties with the issuer: the estimated coefficient of *social tie to issuer* is 0.35 and statistically highly significant.

We now turn to the selection of co-managers. Recall that we assume a hierarchical decision model, by which the book managers are chosen first and then co-managers are chosen from the pool of remaining eligible underwriters. Column (3) in Table 3 presents the results. Several of the underwriter's attributes that matter for the selection of book managers are also relevant for the selection of co-managers; namely whether (i) it has a lending relationship with the issuer, (ii) it is highly ranked, and (iii)

it is a sell-side research provider. Geography matters in a more nuanced way. An underwriter is more likely to be picked as co-manager when it is located in the same state as the issuer, or when it is located in a state adjacent to the issuer. Measures relative to the chosen book managers also seem to be playing a role in the selection model. Underwriters located in the same state as the issuer but in a different state as the book manager are favored. Having an all-star analyst only helps the underwriter to be chosen as co-manager when the pool of book managers also employs one. Finally, the past participation in the roles of book manager, co-manager and syndicate suggest a continuation pattern— underwriters with a higher participation rate in the role of book manager are less likely to be chosen as co-managers.

Column (4) presents results for the choice of syndicate members. Most of the attributes that matter for the selection of co-managers also apply to the selection of syndicate members—with the exception that the presence of an all-star analyst is no longer significant in the model. The suggestion of a quasi-separation of underwriters into distinct roles is reinforced here: Past strength in the role of syndicate member (book manager) makes an underwriter more (less) likely to become the next syndicate member.

The relevance of social ties remain in the multivariate analysis of the choice of co-managers and syndicate members: the *social ties to issuer* coefficients remain positive and significant in the models (3) and (4). Finally, these models further show that social ties to the chosen book manager(s) also help an investment bank become either a co-manager or a syndicate member.

*3.3.2. Robustness Checks*

In this section, we perform two robustness checks. First, we investigate whether the effect of social ties depends on the type of connection. Recall that according to our connection measure, two individuals share social ties either due to common past employment *or* to common education background. The results in Table 3 do not distinguish between the two types. In untabulated results (available upon request) we rerun the regression models in Table 3 after breaking up the ties measure into two separate dummies, one for social ties due to employment and the other for social ties due to education. Evidence suggests that the two types of connections have similar effects. The coefficients on the two separate dummies are similar to the regression results in Table 3 for the models of the choice of book manager

(column 2), and the choice of syndicate member (column 4). The exception occurs for the model of the choice of underwriter (Column 1) and the choice of co-manager (column 3), where only the coefficient on social ties due to employment is significant. However, the relative impact of the two types of social ties on the syndicate formation must be interpreted with caution. First, social ties based on past employment are not mutually exclusive from those established through education background. Second, while disclosure of employment information is often mandatory, ties identified via education are typically based on voluntarily disclosed information, which may affect the statistical power of this analysis by the different types of social ties (Cai, Walkling, and Yang, 2015).

Our second robustness analysis examines whether the results in Table 3 are overstated due to the large number of eligible underwriters. Recall from Table 1 that the average IPO faces about 272 eligible underwriters from which to pick the book managers, co-manager and syndicate members. It is possible that some of these candidates are irrelevant to the choice model—they would never be chosen anyway for some of these roles.[7] The inclusion of potentially irrelevant data points can artificially decrease the standard errors in the estimation models. As a robustness test, we re-estimate the models after limiting the set of eligible underwriters. We follow Kuhnen (2009) and limit the set of eligible underwriters according to the propensity of underwriters to be considered for each role, based on determinants other than the social ties measures.

Take the choice of book managers, for example. We first run a logistic regression without the social ties measure and collect for each underwriter the predicted probability (propensity score) of being selected for the role of book manager. The sample of eligible underwriters for each available book manager position is then limited to 20 candidates. They include the actual chosen book managers plus the next 19 underwriters with either (1) the highest propensity scores, or (2) the propensity scores that are closest to the actual chosen book managers' score. We then rerun the full choice model for book

[7] We do require an underwriter to have had some participation in the underwriting market prior to becoming eligible. However, it is possible that some underwriters are only active as syndicate members, in which case they would be irrelevant to the choice of book managers or co-managers. It is also possible that an underwriter has for practical purposes exited the underwriting market, though not through a merger or bankruptcy. Since we do not see this exit signal, we would count this underwriter as still eligible for the choice models.

manager—adding back the social ties measure—with the limited sample of eligible underwriters. We try regressions using the sample selection (1) or (2) above. Similar procedures are performed for the choice models of co-managers and syndicate members. Untabulated results (available upon request) show that the coefficients for the social ties measures remain economically and statistically significant with the correct sign. That is, the inferences regarding the association between social ties and the syndicate formation are not an artifact of the large sample of eligible underwriters employed in the estimation procedure.

*3.3.3. Economic Significance*

To illustrate the economic significance of social ties in the formation of underwriting syndicates, we first rely on the odds-ratio associated with each measure. The odds-ratio (not reported in the table) associated with the *social ties to issuer* coefficient in model (2) suggests that the odds of being chosen as book manager are 42% higher for an underwriter with ties to the issuer. For the choices of co-manager (syndicate member), the improvements in the odds of being chosen are smaller, though still relevant, at 19% (18%) when the underwriter has social ties with the issuer.

Analyzing the relevance of the determinants of syndicate participation through changes in probabilities deserve special care. The issue is that the baseline probabilities of an underwriter being chosen as a book manager, co-manager, or syndicate member are quite small. Take the choice of book managers, for example. Recall from Table 1 that the average IPO has 1.5 book managers chosen out of 272 eligible underwriters, indicating an unconditional probability of 0.55% that an investment bank is chosen as a book manager. The predicted probability from Table 3, column (2) computed at the mean value of the independent variables is a mere 0.13%. Applying an improvement of 42% on the odds-ratio yields a probability of 0.18% that the average eligible underwriter, with social ties to the issuer, will be chosen as a book manager. These small numbers are driven by the large sample of eligible underwriters, which result in the average eligible underwriter being particularly distinct from the average chosen book manager. For example, only 0.11% of the eligible underwriters not used in a syndicate have a lending relationship with the issuer, compared to 7% of the underwriters that are actually chosen as book

managers.

There are at least two ways to analyze the importance of the social ties in the formation of IPO syndicates. First, we can look at conditional probabilities. For example, if we focus on the eligible underwriters that have a lending relationship and that are ranked above 8, their baseline probability of being chosen as book manager is 6.7%. However, if the eligible underwriter further enjoys social ties with the issuer that probability increases to 9.5%. Second, we can avoid the pitfall of such a small baseline probability by reducing the sample of eligible underwriters. If we rely on the sampling procedure of considering as eligible for each book manager position only the 20 underwriters with the highest propensity scores, the probability of the average underwriter being chosen as book manager goes from 5.7% (in the absence of social ties to the issuer) to 7.9% (when social ties to the issuer exist).

Similar interpretations apply to the improvements in the probabilities of being chosen as a co-manager or syndicate member. For the choice of co-manager, the baseline probability across all eligible underwriters is just 0.34%, but if we restrict the sample to investment banks with a lending relationship and those that are ranked above 8, the baseline probability becomes 4.7%. If the investment bank further has social ties with the issuer, the probability jumps to 5.5%; add to that the presence of social ties to the book manager and the probability of being chosen as co-manager increases to 9.4%. For the choice of syndicate member, average underwriters with a lending relationship and those with a reputation rank above 8 have a 2.7% chance of being picked as syndicate member, which increases to 4.1% when social ties to the issuer and to the book manager are in place. These noticeable improvements attest to the economic significance of the association between social ties and the formation of IPO syndicates.

## 4. Social Ties and IPO Outcomes

In this section, we examine the role, if any, of social ties in shaping outcomes associated with an IPO. We focus on outcomes that may be beneficial to the parties involved in the social ties between the underwriters and the IPO issuers.

*4.1 Outcomes that May Favor Underwriters*

We have shown that having social ties to the IPO issuer makes an investment bank more likely to be included in the IPO's underwriting syndicate. Being part of underwriting syndicate is already a valuable outcome to an investment bank, but advantages from social ties to the issue can go further. Conditional on being part of the underwriting syndicate, the investment bank may enjoy favorable conditions related to the contractual arrangements between the issuer and members of the underwriting syndicate. We analyze three of such arrangements: seniority status within the underwriting syndicate, the share allocation that an investment bank receives, and the overall compensation of the underwriting syndicate.

*4.1.1 Seniority Within the Underwriting Syndicate*

Does the presence of social ties with the issuer help the investment bank improve its relative position in an underwriting syndicate—for example serving as a book manager rather than a co-manager, or co-manager rather than a syndicate member?[8] The analysis in Table 3 does not directly address this question. That analysis shows that social ties help an investment bank to achieve *any* of the three roles in an IPO syndicate, but it does not answer whether an investment bank is more or less likely to, say, get a more senior role relative to its typical role in previous syndicate participation.[9] Instead, we need to ask whether, among the underwriters chosen to participate in the deal, the presence of social ties helps an underwriter to get a more senior role. To address this question, for each underwriter *j* participating in an IPO *i* we define a variable capturing whether *j* gets a more senior position: it is a dummy equal to one whenever the role of *j* in the current IPO syndicate *i* is above the average role *j* had in participating deals

[8] The particular role served by the investment bank is an important distinction that affects direct fee income and indirect income via the ability to allocate underpriced shares to purchasing investors. Book manager take most of these two types of income, followed by co-managers (Chen and Ritter, 2000). There are also likely to be lasting future benefits as the bank can build on its reputational capital associated with being able to successfully take new firms public. As an example of how investment banks advertise their involvement in recent IPOs, see the following link from the Morgan Stanley website: http://www.morganstanley.com/ideas/alibaba-turns-to-morgan-stanley-in-largest-ever-ipo/.

[9] At first glance, one observes that the coefficient on the social ties measure *seems* higher for the regression modeling the choice of book manager compared to the regression modeling the choice of co-manager. However, the two coefficients are not directly comparable: They refer to two different regressions, each explaining a different outcome and each based on a distinct sample.

in the past 5 years. In this computation we set role=0 for non-syndicate participation, role=1 for syndicate member, role=2 for co-manager, and role=3 for book manager. We then run a logistic model to determine the likelihood that *j* gets a more senior position in IPO deal *i*. As explanatory variables we rely on the same determinants of the choice of a book manager.

Results appear in Column (1) of Table 4. We observe that the usual determinants of the choice of book manager—for example, the presence of a lending relationship, providing sell-side analyst recommendations, having a star analyst, etc.—also help the underwriter to get a more senior position in the IPO syndicate structure. More important, we confirm that social ties matter, as evidenced by the significantly positive coefficient on the social ties measure. The magnitude of the coefficient implies that the presence of social ties between an underwriter and the IPO firm is associated with a 37% increase in the odds of the underwriter getting a more senior position compared to its recent past participation in underwriting syndicates.

*4.1.2 Share Allocation*

Share allocation refers to the number of shares each underwriter agrees to buy from the issuer. The risk-sharing hypothesis would consider this allocation a burden to an IPO participant—e.g., if the shares cannot later be sold at the offer price. However, there is plenty of evidence to suggest that this is not the case. Consistent underpricing suggests that the risk from holding allocated shares rarely binds. On the contrary, there is anecdotal and academic evidence on how allocated shares can turn into "hot currency" and directly benefit the underwriter—e.g., allowing them to reward buy-side clients or to practice "spinning."[10] Corwin and Schultz (2005), for example, show that high-ranked underwriters demand higher share allocations to participate in the roles of book manager and co-manager. If share allocation is important for an underwriter, we conjecture that social ties, besides being associated with the formation of the IPO syndicate, and the role served by the underwriter, may also be associated with the

[10] See Pulliam and Smith, "Linux deal is focus of IPO-commission probe," *The Wall Street Journal* December 12, 2000, for a discussion about rewarding buy-side clients, and Siconolfi, Michael, 1997, "Underwriters set aside IPO stock for officials of potential customers," *The Wall Street Journal*, November 12, 1997, for a discussion about spinning. Liu and Ritter (2010) examine the consequences of spinning.

allocation of shares.

To investigate the importance of the social ties between an underwriter and the issuer on its share allocation, we examine the share allocation both across all classes of underwriting roles within the syndicate (i.e., book managers, co-managers, and syndicate members) and within a single class of underwriting role.

First, share allocation within each IPO varies substantially across the roles of participants in the underwriting syndicate. The lion's share of the allocations, and the attendant underwriting fees and selling concessions, go to the book managers and co-managers. In our sample, the average book manager underwrites 39% of the IPO's shares, compared to 12% for the average co-manager and 1.3% for the average syndicate member.[11] Therefore, one way for an investment bank to increase its share allocation is to "move up the ladder" and get a more senior position in the underwriting syndicate. Results from Model (1) in Table 4 suggest that having social ties to the issuer increases an underwriter's likelihood of obtaining a more senior position, compared to its typical role in previous syndicate participation. However, it does not address the question whether, among the chosen underwriters, having social ties to the issuer helps the connected underwriter to compete for the senior position and therefore receive more share allocations.

We examine share allocation among underwriters across all ranks within each underwriting syndicate in Model (2) of Table 4. The results show that an underwriter has higher share allocation if it has lending relationship with the issuer, has a Carter-Manaster reputation above 8, provides sell-side research coverage, or has past experience in serving in the role of book, co-manager, or syndicate member. Most importantly, the estimated coefficient of *social ties to issuer* is 0.23 and statistically significant, suggesting that an underwriter's social tie to the issuer is associated with higher share allocation.

Finally, we analyze share allocation within each participation role in an IPO. Given that very

[11] These statistics come from Table 1 after adjusting for the number of participants in each role. For example, Table 1 shows that the overall share allocation to book managers amount to 57.99%. Given that the average number of book managers per IPO is 1.5, the average share allocation per book manager is 57.99%/1.5=39%.

often there is no variation in share allocation among book managers or co-managers (in many cases trivially, given that there is only one underwriter in that role), we focus our analysis on the participants in a syndicate role. We analyze share allocation in a relative manner: that is, we examine the percentage excess shares allocated to the underwriter in the role of syndicate member.[12] This within-role relative measure better controls for the different dollar allocations across IPOs.

We acknowledge the possibility of many other drivers of share allocation. Our model for determining the share allocation resembles the model determining participation in the different roles of an IPO syndicate. If share allocation is driven by the relative importance of an underwriter to the IPO syndicate, the same attributes that drive the participation in the syndicate could also determine how many shares the underwriter receives. For example, if an underwriter enters the syndicate because of its high rank—that is, the certification effect is important to whoever is deciding the composition of the IPO syndicate—on the margin this underwriter should be better compensated for the certification benefit it is conferring on the syndicate. Similarly, if social ties drive participation, they could as well affect share allocation within the syndicate.

Column (3) of Table 4 presents the OLS regressions results explaining the percentage excess share allocation within the syndicate member role. Notice that the data point in these regressions is an underwriter that was chosen for the role of syndicate member, rather than the pool of eligible underwriters that could have been chosen. We also exclude from each sample the IPOs with just one syndicate member—as, by construction, the dependent variable in these cases is trivially set to zero. The results confirm the importance of underwriter's strength in how it receives allocation of shares: High-ranked underwriters receive more shares relative to their IPO peers. As for the social ties, we confirm their relevance. Having ties to the issuer helps the underwriter enjoy a share allocation that is 8% higher than the average allocation among its peer syndicate members.

[12] The percentage excess shares allocated to an underwriter is calculated as the number of shares allocated to the underwriter minus the average number of shares allocated to the IPO underwriters in the same role, divided by the average number of shares allocated to the IPO underwriters in the same role. For example, assume an IPO has three syndicate members: Bank A underwrites 1,000,000 shares while Banks B and C underwrite 500,000 shares each. The percent excess shares for Bank A is 50% and is -25% for both Banks B and C.

*4.1.3 Underwriters' Compensation*

Do issuers pay more to its socially connected underwriters? Share allocations are important, but they do not represent direct revenue for underwriters. We next examine whether the presence of social ties between the book manager(s) and the issuer grants the syndicate more favorable compensation. Following Cook et al. (2006), we adopt two measures of dollar value compensation paid to the IPO underwriting syndicate: the dollar gross spread as total compensation and the selling concession as the compensation for selling the issue.[13] The selling concession often represents nearly 60% of the gross spread; and thus constitutes a significant revenue source for underwriters.

We run OLS regressions where the dependent variables are measures of dollar compensation. The data point in each regression is now an IPO and the main explanatory variable is whether social ties exist between any of the book managers in the syndicate and the IPO issuer. We also control for variables that have been shown to relate to compensation, such as (the logarithm of) IPO proceeds, average rank of the book managers, and VC backed dummy etc. (Cook et. al., 2006; Fernando, Gatchev, May, and Megginson, 2014).

Regression results appear in Table 5. As expected, dollar compensation increases with bigger IPOs (in terms of offer proceeds) and with IPOs having more prestigious underwriters. Lower compensation is observed for high-tech IPOs and when there is larger number of recent IPOs. As for our question, we find that the presence of social ties between book manager(s) and the IPO issuer is positively related to both total dollar compensation and selling concession. Other things equal, such ties are associated with an increase of $1.07 million ($1.09 million) in total compensation (selling concession) flowing to the IPO syndicate. Given that the gross spread (selling concession) is $12.43 million ($6.78 million) for an average IPO in our sample (Table 1), this increase represents an 8.6% (16.1%) increase in the total compensation (selling concession) paid to the underwriting syndicate.

[13] We favor examining total dollar compensation instead of a scaled version (e.g., percentage of proceeds). Cook et al. (2006) explain that in the presence of economies or diseconomies of scale, there likely are non-linearities between total dollar compensation and total proceeds, which can be distorted when using the scaled version of compensation.

*4.2 Outcomes that May Favor Issuers*

What do IPO firms want from the IPO process—particularly from the efforts of underwriters? First and foremost, firms go public to increase their ability to raise funds—and the IPO event is a public equity offering—so raising more funds seem to be a natural objective for issuers. Cliff and Denis (2004), Liu and Ritter (2011) and others have added some non-price dimensions—such as the quality of the underwriter and whether sell-side coverage may be provided—that can also be important factors in driving the formation of the underwriting syndicates. In analyzing benefits to the issuer firm, Loughran and Ritter (2002) emphasize the effect of the IPO process on the wealth of pre-IPO shareholders. In this section, we examine some of the IPO outcomes that may be favorable to the IPO issuer.

*4.2.1 Offer price revision*

One important outcome from the perspective of issuers is a positive offer price revision, where the offer price revision is measured as the percentage change from the midpoint of the initial price range to the final offer price (Corwin and Schultz, 2005). This increase benefits both the IPO firm, which can raise more funds in the process, and the pre-IPO shareholders who are selling shares in the offering. A higher offer price can derive from, for example, the promotion efforts by the underwriters (Cook et al., 2006). Such outcome is consistent with the *quid pro quo* hypothesis: underwriters with social ties to the issuer are favored in the formation of the IPO syndicate with the expectation that they "return the favor" by expending effort to yield a higher offer price.

However, an offsetting mechanism may also derive from social ties between underwriters and the issuer. These ties may reduce the information asymmetry regarding the IPO firm. This would allow the underwriters to have a more accurate initial filing price, resulting in less need of an offer price revision. Indeed, in unreported results (available upon request) we observe that the presence of social ties between the issuer and the book managers is associated with lower levels of information asymmetry for the firm, proxied by the logarithm of the variance of initial returns (Lowry, Officer, and Schwert, 2010).

We follow Corwin and Schultz (2005) and measure offer price revision as the percentage change in offer price from the mid-point of the initial filing range. We also define a binary dependent variable

identifying an upward price revision—equal to one if the offer price revision is positive, and zero otherwise. We then run an OLS regression for the continuous offer price revision measure and a logistic regression for the dichotomous proxy. We add control variables deemed important in explaining offer price revision (Cook et. al., 2006; Hanley and Hoberg, 2010; Bauguess et al., 2014). Regression results appear in Table 6. We observe some evidence that socially connected underwriting syndicates are associated with positive price revisions: In the OLS regression, the coefficient on social ties is marginally significant (*p*-value=0.0974), while in the logistic regression it is significant at a 5% level (*p*-value=0.0433). The coefficient on the logistic regression suggests that the odds of an upward offer price revision increases by 22% in the presence of social ties between the IPO firm and the book managers.

*4.2.2 Underpricing*

One of the most watched outcomes of an IPO is its initial (first-day) return. There is extensive literature discussing their empirical pattern; that these first-day returns are on average positive and large—a phenomenon that has come to be known as underpricing. Many theories and models have been proposed to explain underpricing. Commonly accepted explanations are based on the resolution of information asymmetry surrounding IPOs. Benveniste and Spindt (1989) model IPO underpricing as an information-extraction device—as rent for information offered to informed investors by investment bankers. In the context of our analysis, it is important to delineate which, if any, specific pattern of initial-day returns would be beneficial to issuers. But here conflicting stories emerge.

Higher initial returns are often taken as a measure of success of the IPO process. This could come about as result of a more successful marketing effort by underwriters (Krigman, Shaw, and Womack, 2001; Cook et al., 2006). Therefore, if the issuer prefers higher initial-day returns, it can confer advantageous contractual terms to socially connected underwriters in exchange for their efforts to yield exactly this underpricing pattern. Certainly underwriters would not fight against this objective. In fact, higher initial returns may be actively sought out by underwriters, since it lowers their underwriting risk and also can be used to generate indirect income through the quid pro quos they may receive from their clients in return for the allocation of underpriced shares (Loughran and Ritter, 2002).

Conversely, more underpricing means more money "left at the table" by the issuer. In this case, the issuer would prefer *lower* initial returns, so socially connected underwriters would return the favor by minimizing underpricing. Also working against finding higher initial returns in the presence of social ties is the possibility that these ties allow for a lower level of information asymmetry. Lower level of information asymmetry can in turn lead to a more accurate offer price, implying *lower* initial returns in the presence of social ties.

Which effect prevails becomes an empirical question. To examine this issue, we regress IPO initial returns on our measure of social ties along with other control variables. Table 7 reports the results. Consistent with the empirical evidence documented in the existing literature, our results suggest that offer price revision, book managers' reputation ranking, and being a VC-backed issuance are positively related to the IPO initial returns. We also find that greater IPO proceeds, being a high-tech firm, having more recent IPO offerings, and greater float are associated with lower initial returns. More importantly, we find no clear association between the presence of social ties and the IPO's initial returns: the coefficient on social ties is not significantly different from zero.

*4.2.3 Pre-IPO Shareholders Wealth Gains*

Loughran and Ritter (2002) and Bradley and Jordan (2002) discuss how, in isolation, neither the level of offer price revision nor the level of initial returns paint a complete picture of what matters to IPO issuers. A more comprehensive objective for the issuer, particularly its pre-IPO shareholders, is the net wealth gains from the IPO process. Such wealth gains can be impacted by both the offer price revision and the IPO's initial returns. On the one hand, pre-IPO shareholders benefit from higher post-IPO stock price with respect to the shares they retain. Taking the initial filing price as the baseline level, a higher post-IPO stock price results from both higher offer price revisions and higher first-day returns. Thus, with respect to their retained shares, insiders are better off with both an upward change in offer price and with higher initial returns (i.e., the wealth effect). On the other hand, pre-IPO shareholders "leave money on the table" when shares are sold at an offer price below what it could have been. Thus, for the portion of the shares they or the firm sells during the IPO process, pre-IPO shareholders lose from higher initial

returns (dilution effect). The overall effect of offer price revision and initial returns on insider's wealth depends on how much shares the pre-IPO shareholders retain and how much is sold in the IPO. The net gain—wealth effect minus dilution effect—thus properly captures the implications of both the offer price revision and IPO initial returns on the pre-IPO shareholders' wealth.

The *quid pro quo* hypothesis implies that the IPO issuer—represented by its pre-IPO shareholders—may hire socially connected underwriters with the expectation that the underwriters "return the favor" by providing for a positive net gain from the IPO process. To test the hypothesis, we examine net gains from the IPO process and whether they relate to the presence of social ties. As in Bradley and Jordan (2002), we measure the pre-IPO shareholders' wealth effect as the post-IPO price (closing price on the first day of trading) minus the midpoint of the IPO's initial filing range, times the number of shares retained by pre-IPO shareholders; and the dilution effect is defined as post-IPO price minus offer price (i.e., the initial return), times the number of shares sold in the IPO.

We initially test in a univariate setting whether the frequency of positive net gains is related to the presence of social ties between the issuing firm and the book underwriters. Next, we follow Cook et al. (2006) and run a logistic regression on a binary variable equal to one whenever the wealth effect surpasses the dilution effect. Besides our measure of social ties, we add as explanatory variables the logarithm of IPO proceeds and a measure of IPO's float ratio—defined as the number of shares issued in the offering divided by the number of shares issued and outstanding after the offering. In an alternative specification, we also add an underpricing residual control variable, taken as the residual from regressing IPO's initial returns on the social ties dummy. This works as a proxy for a potential separate effect of initial returns on the wealth gains.

Table 8 presents the results of the logistic regression testing this relation in a multivariate setting. Consistent with Cook et al. (2006), we observe that reducing the IPO's float increases the likelihood of a net gain to pre-IPO shareholders. Contrary to Cook et al. (2006), we do not see a relationship between the likelihood of a net gain and IPO size. More importantly, the coefficient on social ties is significantly positive in both specifications. The results suggest that, other things equal, the presence of social ties

between the issuer and the book managers is associated with an increased likelihood that insiders' wealth effects are greater than the dilution effects. The effects are also economically significant, with an increase of 45% in the odds of positive net gains for pre-IPO shareholders in the presence of social ties.[14]

In summary, there is limited evidence that the presence of social ties matters in predicting the IPO's degree of offer price revision or its initial returns. That might not be surprising, given the conflicting stories relating these outcomes to the IPO firm's objectives in taking a firm public. As a more unequivocal answer of whether IPO's pre-IPO shareholders profit from the IPO process, we show that the presence of social ties between the issuer and the book managers is positively associated with increases in the insiders' net wealth. This may be the reward that the insiders get for bringing the socially connected underwriters on board of the IPO syndicate, and for giving them advantageous contractual terms with respect to compensation and share allocation. [15]

## 5. Conclusion

Prior studies document the influence of social ties on the formation of business relations in several different settings—for example, board membership, venture capital syndication, and mutual fund advisory roles. We extend this literature and examine the role of social ties in the formation of IPO underwriting syndicates. We find that the presence of social ties between an investment bank and the IPO firm significantly increases the likelihood that the bank is chosen as the book manager, co-manager or a

[14] The logistic regression is not controlling for the amount of pre-offer publicity, the main variable of interest in Cook et al. (2006), so it is possible that the presence of social ties is proxying for the publicity measure. However, that would be consistent with a quid pro quo: Socially connected underwriters would increase their publicity efforts to return the favor to IPO issuers for the contractual advantages they receive due to the social ties.

[15] Of course, increase in insiders' wealth may not represent all that the IPO firm cares about from the IPO process. Notably, sell-side coverage by members of the IPO syndicate has been considered an important outcome of the IPO process (e.g., Loughran and Ritter, 2004). In fact, Table 3 shows that the possibility that the underwriter will provide sell-side coverage for the IPO firm is a determinant of whether it becomes part of the IPO syndicate. Thus, we could further hypothesize that the IPO firm hires its socially connected underwriters because it expects this connected underwriter to abide by the implicit agreement that post-IPO coverage will be provided. We argue, though, that net gains in pre-IPO shareholders' wealth is a more tangible, short-term, benefit accruing to the IPO firm's decision makers, compared to the effects of a possible future sell-side coverage. Perhaps attesting to this conjecture, in unreported results, we do not find—in a regression setup—a positive relationship between the presence of social ties between the IPO firm and an underwriter and whether the underwriter provides sell-side coverage to the IPO firm.

non-managing syndicate member in the IPO syndicate.

Besides choosing socially connected underwriters, IPO firms supply them with some contractual advantages: IPO syndicates where book managers have social connections to the IPO firm receive higher fees, and the socially connected underwriters tend to enjoy higher share allocations. We also find that the investment banks are not the only parties benefiting from the social ties. Evidence of a *quid pro quo* appears, in that syndicates with socially connected book managers are more likely to yield net wealth gains to the pre-IPO's shareholders. Overall, our results are consistent with the extant literature about prior relations being the basis for a business exchange. In particular, we confirm the previously untested conjecture that social networks in the investment banking industry play an important role in determining an IPO's underwriting syndicate.

We also show that having social ties with the chosen book manager(s) of an IPO significantly increases an investment bank's likelihood of becoming either a co-manager or a non-managing syndicate member. However, we do not address in this paper other effects, and potential *quid pro quo* mechanisms, behind social ties linkages among the investment banking peers. Most of the decision making in an IPO process come from the IPO firm and the book managers. Therefore, co-manager and syndicate members' objectives and actions may be of second order of importance compared to the role of the IPO firm and the book managers. We leave further examination on social ties within the investment banking community as an avenue for future research.

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Table 1: Summary Statistics for IPOs

This table presents summary statistics on the sample of IPOs used in the paper. The sample of IPOs consists of 1,530 U.S. IPOs issued during the period of 2000-2009, that are listed on CRSP/Compustat and after excluding units, REITs, and closed-end funds. The sample of underwriters includes for each IPO all underwriters that were eligible to be chosen as a book manager, co-manager or syndicate member at the time of the IPO. Eligible underwriters for an IPO include all investment banks that are active in the equity underwriting business at the time of the IPO date. Since interpersonal connections can be measured only for firms with BoardEx representation, we require an underwriter to have coverage in BoardEx before it is considered eligible. The table reports summary statistics on the offer characteristics. Offer proceeds are the number of shares offered times the offer price. Price revision is the percentage return from the mid-point of the original filing range to the offer price. Underpricing is the percentage return from the offer price to the first-day closing price. Gross spread measures the total compensation paid to underwriting banks and selling concession measures the compensation paid to the underwriting banks for selling the issue. VC is a binary variable that takes value of one if the issue is VC-backed, and zero otherwise. Tech is a binary variable that takes value of one if the firm resides in a technology industry as identified in Loughran and Ritter (2004), and zero otherwise. Firm age is the number of years between the IPO filing date and the firm's founding date, where the founding dates are obtained from http://bear.warrington.ufl.edu/ritter/FoundingDates.htm. Float is the ratio of the number of shares issued in the offering to the number of shares outstanding after the offering. The next three variables give the number the number of eligible investment banks in the underwriting syndicate with the role of book, co-manager, or non-managing syndicate member. The next variable is the total number of eligible underwriters at the time of the IPO. The share allocation for a set of underwriters (e.g., book managers) is the ratio of shares underwritten by all members in this set (e.g., all book managers of the IPO) to the number of shares issued.

| | Mean | Median | SD | $10^{th}$ percentile | $90^{th}$ percentile |
|---|---|---|---|---|---|
| Offer proceeds ($mil.) | 239 | 110 | 566 | 36 | 462 |
| Price revision (%) | 0.50 | 0.00 | 26.88 | -28.57 | 25.00 |
| Underpricing (%) | 22.04 | 7.86 | 46.95 | -4.50 | 57.69 |
| Gross spread ($mil.) | 12.43 | 7.27 | 18.41 | 2.45 | 26.55 |
| Selling concession ($mil.) | 6.78 | 3.92 | 10.26 | 1.37 | 14.40 |
| VC | 0.44 | - | - | - | - |
| Tech | 0.26 | - | - | - | - |
| Firm age | 16.69 | 8.00 | 24.73 | 2.00 | 39.00 |
| Float (%) | 32.12 | 26.57 | 20.56 | 13.19 | 58.66 |
| Number of book managers | 1.51 | 1.00 | 0.81 | 1.00 | 2.00 |
| Number of co-managers | 2.97 | 3.00 | 2.05 | 1.00 | 5.00 |
| Number of syndicate members | 4.69 | 1.00 | 7.44 | 0.00 | 13.00 |
| Number of eligible underwriters | 272.03 | 272.00 | 40.14 | 244.00 | 315.00 |
| Book managers share allocation (%) | 57.99 | 53.93 | 36.29 | 35.07 | 82.00 |
| Co-managers share allocation (%) | 36.95 | 38.98 | 21.52 | 14.00 | 56.93 |
| Syndicate members share allocation (%) | 5.96 | 0.48 | 12.41 | 0.00 | 17.36 |

Table 2: Summary Statistics for Underwriters

This table presents summary statistics on the sample of underwriters used in the paper. The sample of IPOs consists of 1,530 U.S. IPOs issued during the period of 2000-2009, that are listed on CRSP/Compustat and after excluding units, REITs, and closed-end funds. The sample of underwriters includes for each IPO all underwriters that were eligible to be chosen as a book manager, co-manager or syndicate member at the time of the IPO. The table reports summary statistics on the characteristics of the eligible underwriters associated with each IPO, broken down by whether the underwriter was chosen as a member of the underwriting syndicate (in any role), or was chosen as a book manager, co-manager, syndicate member, or did not participate at all in the IPO syndicate. An underwriter has social ties to the issuer (book manager) if one of its executives or directors once had employment or education overlap with an executive or director of the issuer (book manager). Lending relationship is a dummy equal to one if at any point in the five-year period preceding the IPO date there was a loan originated for the IPO firm for which the underwriter was a lead arranger, and zero otherwise. Rank takes values ranging from 0 to 9 based on the Carter and Manaster (1990) ranking, with a rank of 9 indicating banks with the highest prestige. Analyst is a dummy equal to one if the research division of the underwriting firm has issued at least one recommendation for any firm in the year preceding the IPO date, and zero otherwise. Star analyst is a dummy equal to one if the underwriter employs one of the top three analysts in the IPO's industry, according to the *Institutional Investor* voting in the year prior to the IPO date, and zero otherwise. We use dummies to identify whether the underwriter is located in the same state as the issuer, same state as the book manager, adjacent state to the issuer, and adjacent state to the book manager. We also report the strength of each underwriter as measured by its past participation in IPO syndicates in the roles of book manager, co-manager or syndicate member. More specifically, past role as book manager (co-manager) [syndicate member] is the fraction of IPOs in the 20 calendar quarters preceding the calendar quarter of the IPO issuance for which the underwriter was a book manager (co-manager) [syndicate member].

Table 2: (*Continued*)

| | Chosen Book Managers | | Chosen Co-managers | | Chosen Syndicate members | | Other Eligible Underwriters | |
|---|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD | Mean | SD |
| Social ties to the issuer (%) | 16.08 | 36.75 | 9.09 | 28.76 | 4.72 | 21.20 | 1.97 | 13.90 |
| Social ties to the book manager (%) | n/a | n/a | 53.47 | 49.89 | 27.53 | 44.67 | 12.80 | 33.41 |
| Lending relationship (%) | 9.25 | 28.98 | 5.30 | 22.41 | 1.18 | 10.80 | 0.22 | 4.73 |
| Rank | 8.27 | 1.38 | 7.78 | 1.43 | 7.03 | 1.75 | 6.93 | 2.46 |
| Analyst | 0.96 | 0.19 | 0.93 | 0.25 | 0.82 | 0.39 | 0.49 | 0.50 |
| Star analyst | 0.19 | 0.39 | 0.08 | 0.27 | 0.01 | 0.12 | 0.01 | 0.10 |
| Same state as issuer (%) | 11.56 | 31.99 | 12.06 | 32.57 | 11.70 | 32.14 | 7.01 | 25.54 |
| State adjacent to issuer (%) | 14.08 | 34.79 | 12.49 | 33.06 | 12.63 | 33.23 | 9.93 | 29.90 |
| Same state as book manager (%) | n/a | n/a | 40.40 | 49.08 | 34.70 | 47.61 | 27.49 | 44.65 |
| State adjacent to book manager (%) | n/a | n/a | 11.98 | 32.48 | 12.28 | 32.82 | 13.60 | 34.28 |
| Past role as book manager | 0.07 | 0.05 | 0.03 | 0.04 | 0.01 | 0.01 | 0.00 | 0.02 |
| Past role as co-manager | 0.06 | 0.04 | 0.05 | 0.04 | 0.01 | 0.02 | 0.01 | 0.02 |
| Past role as syndicate member | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.05 | 0.02 | 0.03 |

Table 3: The Syndicate Formation

This table presents the coefficient estimates from logistic regressions modeling the choice of underwriters, book managers, co-managers and syndicate members in each IPO. The sample of IPOs and underwriters is as described in Table 1. Each model includes one observation for each underwriter that could have been chosen for the role being modeled. For the role of book manager, the sample thus includes all eligible underwriters for each IPO. For the role of co-manager (syndicate member), the sample includes all eligible underwriter in each IPO except the underwriter(s) that were chosen as book managers (book managers or co-managers). The dependent variable takes a value of one if the underwriter is chosen to serve as the modeled role in the IPO syndicate and zero otherwise. Rank above 8 is a dummy equal to one if the Carter-Manaster rank of the underwriter is above 8, and zero otherwise. Book manager star analyst is a dummy equal to one if one of the IPO's book managers employs one of the top three analysts in the IPO's industry, according to the *Institutional Investor* voting in the year prior to the IPO date, and zero otherwise. Number of IPOs is the total number of firms that went public during the 180 calendar days prior to the IPO's filing date using our sample selection criteria. Year dummies are included in all regression models. The other independent variables are defined in Tables 1 and 2. Standard errors, reported in parentheses, are computed using heteroskedasticity-consistent standard errors and are corrected for clustering at the IPO level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 3: (*Continued*)

| | Choice of Underwriters | Choice of Book Manager | Choice of Co-Manager | Choice of Syndicate Member |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| Intercept | -6.46 (0.09)*** | -8.38 (0.23)*** | -7.89 (0.15)*** | -8.79 (0.31)*** |
| Social ties to issuer | 0.24 (0.04)*** | 0.35 (0.07)*** | 0.18 (0.07)*** | 0.17 (0.07)** |
| Lending relationship | 1.75 (0.07)*** | 2.11 (0.11)*** | 1.68 (0.10)*** | 0.78 (0.14)*** |
| Ln(IPO proceeds) | 0.32 (0.01)*** | 0.14 (0.02)*** | 0.34 (0.02)*** | 0.30 (0.01)*** |
| Rank above 8 | 0.07 (0.02)*** | 0.74 (0.08)*** | 0.21 (0.04)*** | 0.20 (0.03)*** |
| Analyst | 1.32 (0.03)*** | 1.89 (0.14)*** | 1.75 (0.07)*** | 0.94 (0.04)*** |
| Star Analyst | 0.15 (0.05)*** | 0.24 (0.07)*** | -0.01 (0.09) | 0.12 (0.14) |
| Same state as issuer | 0.67 (0.03)*** | 0.48 (0.08)*** | 0.40 (0.08)*** | 0.50 (0.08)*** |
| Adjacent state to issuer | 0.19 (0.03)*** | 0.06 (0.07) | 0.18 (0.05)*** | 0.23 (0.04)*** |
| Past role as book manager | 6.81 (0.46)*** | 22.55 (0.68)*** | -3.49 (0.77)*** | -23.85 (1.58)*** |
| Past role as co-manager | 14.56 (0.46)*** | 10.42 (0.84)*** | 20.34 (0.66)*** | 2.41 (1.10)** |
| Past role as syndicate | 10.07 (0.24)*** | 6.65 (0.62)*** | 8.64 (0.42)*** | 17.38 (0.37)*** |
| Log (number of $IPOs_{-180,\ filing\ date}$) | 0.02 (0.01)** | -0.01 (0.02) | 0.01 (0.02) | 0.02 (0.01)** |
| Social ties to book manager | | | 0.55 (0.04)*** | 0.25 (0.04)*** |
| Star analyst x book manager star analyst | | | 0.46 (0.13)*** | -0.06 (0.28) |
| Same state as book manager | | | 0.11 (0.04)** | 0.17 (0.03)*** |
| Adjacent state to book manager | | | -0.06 (0.05) | 0.04 (0.04) |
| Same state as issuer, different from book | | | 0.44 (0.11)*** | 0.37 (0.09)*** |
| Year fixed effect | Yes | Yes | Yes | Yes |
| N | 309,897 | 309,897 | 307,959 | 304,230 |
| Pseudo $R^2$ | 0.24 | 0.35 | 0.24 | 0.21 |

Table 4: Underwriter role seniority and share allocation

This table presents analysis of the underwriting role seniority and share allocation assigned to members of IPO syndicates. The sample of IPOs and underwriters is as described in Table 1, including one observation for each underwriter in the IPO syndicate. The dependent variable in model I is a binary variable that takes the value of one if the underwriter is assigned a role senior to its average role served in other IPO syndicates over the five-year period preceding the IPO date. To measure role seniority, we assign 0 to no syndicate participation, 1 to syndicate member, 2 to co-manager, and 3 to book manager. The dependent variable in model II is the logarithm of the number of shares allocated to each underwriter. The dependent variable in model III is the percentage excess shares allocated to the underwriter, measured as the number of shares allocated to the underwriter minus the average number of shares allocated to all syndicate members of the IPO, divided by the average number of shares allocated to all syndicate members. The independent variables are defined in Tables 1, 2, and 3. Standard errors, reported in parentheses, are computed using heteroskedasticity-consistent standard errors and are corrected for clustering at the IPO level. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table 4: (*Continued*)

| | Seniority Up Dummy | Share Allocation | |
|---|---|---|---|
| | Sample of All Underwriters | Sample of All Underwriters | Sample of Syndicate Members |
| | (1) | (2) | (3) |
| Intercept | 1.07 (0.24)*** | 10.98 (0.21)*** | -0.08 (0.06) |
| Social ties to issuer | 0.31 (0.10)*** | 0.23 (0.05)*** | 0.08 (0.03)*** |
| Lending relationship | 0.98 (0.15)*** | 0.61 (0.08)*** | 0.11 (0.06)* |
| Ln(IPO proceeds) | -0.19 (0.02)*** | 0.27 (0.03)*** | -0.01 (0.01) |
| Rank above 8 | 0.30 (0.06)*** | 0.53 (0.03)*** | 0.16 (0.01)*** |
| Analyst | 0.41 (0.10)*** | 0.14 (0.04)*** | -0.02 (0.01) |
| Star Analyst | 0.27 (0.10)*** | 0.07 (0.05) | 0.01 (0.04) |
| Same state as issuer | 0.09 (0.08) | -0.07 (0.05) | 0.02 (0.02) |
| Adjacent state to issuer | 0.04 (0.08) | 0.10 (0.06) | 0.03 (0.02)* |
| Past role as book manager | -1.90 (0.87)** | 9.47 (0.47)*** | -0.59 (0.52) |
| Past role as co-manager | 7.32 (1.00)*** | 9.03 (0.54)*** | 4.75 (0.54)*** |
| Past role as syndicate | 4.49 (0.60)*** | 1.02 (0.33)*** | 0.16 (0.11) |
| Log (number of $IPOs_{-180,\ filing\ date}$) | 0.04 (0.04) | -0.02 (0.02) | 0.00 (0.00) |
| Social ties to book manager | | | 0.03 (0.01)*** |
| Star analyst x book manager star analyst | | | -0.12 (0.09) |
| Same state as book manager | | | 0.02 (0.01)* |
| Adjacent state to book manager | | | 0.00 (0.01) |
| Same state as issuer, different from book | | | -0.04 (0.03) |
| Year fixed effect | Yes | Yes | Yes |
| N | 11,906 | 11,906 | 6,133 |
| Adjusted $R^2$ | 0.23 | 0.48 | 0.19 |

Table 5: Compensation to underwriting syndicate

This table presents the analysis of compensation paid to the underwriting syndicate. The sample of IPOs and underwriters is as described in Table 1. The dependent variables are the logarithm of the dollar gross spread (mil.) in model I and the logarithm of the selling concession (mil.) in model II. Industry dummies (based on 2-digit SIC code) are included in both regression models. All the other independent variables are defined in Tables 1, 2, and 3. Standard errors, reported in parentheses, are computed using heteroskedasticity-consistent standard errors. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

| | Log($Gross Spread)<br>(1) | Log($Selling Concession)<br>(2) |
|---|---|---|
| Intercept | -12.70<br>(0.62)*** | -13.36<br>(0.70)*** |
| Social ties to issuer | 0.07<br>(0.03)** | 0.09<br>(0.03)*** |
| Ln(IPO proceeds) | 0.78<br>(0.04)*** | 0.79<br>(0.04)*** |
| Underwriter rank | 0.06<br>(0.02)*** | 0.05<br>(0.02)*** |
| VC | -0.04<br>(0.03) | -0.03<br>(0.03) |
| Tech | -0.17<br>(0.04)*** | -0.17<br>(0.04)*** |
| Log(Firm age) | 0.01<br>(0.01) | 0.01<br>(0.01) |
| Log (number of $IPOs_{-180,\ filing\ date}$) | -0.02<br>(0.01)* | -0.03<br>(0.01)** |
| Industry fixed effect | Yes | Yes |
| Year fixed effect | Yes | Yes |
| N | 1,258 | 1,215 |
| Adjusted-$R^2$ | 0.82 | 0.80 |

Table 6: Offer price revisions

This table presents the analysis of offer price revisions. The sample of IPOs and underwriters is as described in Table 1. The dependent variable in Model I is the offer price revision measured as the return from the mid-point of the original filing range to the offer price. The dependent variable in Model II is the upward revision dummy that takes a value of one if the offer price is above the mid-point of the initial filing range, and zero otherwise. Market return $_{\text{pre-filing}}$ is the buy and hold value-weighted CRSP returns over the 180 calendar days before the filing date. Market return $_{\text{filing-offering}}$ is the buy and hold value-weighted CRSP returns over window between the filing date and the offering date. All the other independent variables are defined in Tables 1, 2, and 3. Standard errors, reported in parentheses, are computed using heteroskedasticity-consistent standard errors. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

| | Offer Price Revision | Price Revision Up Dummy |
|---|---|---|
| | (1) | (2) |
| Intercept | 0.34 | -1.73 |
| | (0.21) | (0.85)** |
| Social ties to issuer | 0.03 | 0.21 |
| | (0.02)* | (0.10)** |
| Ln(IPO proceeds) | -0.02 | 0.03 |
| | (0.01)* | (0.05) |
| Underwriter rank | 0.03 | 0.14 |
| | (0.01)*** | (0.03)*** |
| VC | 0.01 | 0.30 |
| | (0.02) | (0.09)*** |
| Tech | -0.12 | -0.48 |
| | (0.03)*** | (0.14)*** |
| Log(Firm age) | -0.01 | -0.04 |
| | (0.01)** | (0.04) |
| Market return $_{\text{pre-filing}}$ | -0.06 | -0.18 |
| | (0.08) | (0.52) |
| Market return $_{\text{filing-offering}}$ | 0.27 | 2.26 |
| | (0.12)** | (0.66)*** |
| Log (number of IPOs$_{\text{-180, filing date}}$) | -0.04 | -0.002 |
| | (0.01)*** | (0.001)** |
| Industry fixed effect | Yes | Yes |
| Year fixed effect | Yes | Yes |
| N | 1,239 | 1,239 |
| Adjusted $R^2$ | 0.19 | 0.17 |

Table 7: Initial Returns

This table presents the analysis of initial returns. The sample of IPOs and underwriters is as described in Table 1. The dependent variable is the initial return for the IPO, measured as return from the offer price to the first-day closing price. Price revision residual is the residual from regressing price revision on the set of control variables listed in Table 6. All the other independent variables are defined in Tables 1, 2, and 3. Standard errors, reported in parentheses, are computed using heteroskedasticity-consistent standard errors. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

| | (1) | (2) |
|---|---|---|
| Intercept | 0.56 | 0.58 |
| | (0.20)*** | (0.23)** |
| Social ties to issuer | -0.02 | -0.02 |
| | (0.02) | (0.02) |
| Price revision residual | | 0.85 |
| | | (0.08)*** |
| Ln(IPO proceeds) | -0.03 | -0.03 |
| | (0.01)** | (0.01)*** |
| Underwriter rank | 0.03 | 0.04 |
| | (0.01)*** | (0.01)*** |
| VC | 0.08 | 0.08 |
| | (0.03)*** | (0.02)*** |
| Tech | -0.19 | -0.19 |
| | (0.05)*** | (0.04)*** |
| Log(Firm age) | -0.01 | -0.01 |
| | (0.01) | (0.01)* |
| Market return $_{\text{pre-filing}}$ | 0.06 | 0.07 |
| | (0.12) | (0.10) |
| Market return $_{\text{filing-offering}}$ | 0.13 | 0.13 |
| | (0.14) | (0.13) |
| Log (number of IPOs$_{-180,\ \text{filing date}}$) | -0.06 | -0.05 |
| | (0.02)** | (0.02)*** |
| Float | -0.24 | -0.16 |
| | (0.05)*** | (0.04)*** |
| Industry fixed effect | Yes | Yes |
| Year fixed effect | Yes | Yes |
| N | 1,239 | 1,239 |
| Adjusted $R^2$ | 0.26 | 0.48 |

## Table 8: Insider wealth gains

This table presents the analysis of IPO insider wealth gains. Panel A reports the univariate statistics and Panel B reports logit regression results. The dependent variable in models I and II in Panel B is a binary variable that take value of one if insiders' wealth effects are greater than the dilution effects. We follow Cook et. al (2006) and define the wealth effects as (first day closing price – midpoint filing range)*number of shares retained by pre-IPO stockholders, where the number of shares retained equals to the difference between shares outstanding after the offering and the shares issued in the offering. The dilution effects equal (first day closing price – offer price)*number of shares issued in the offering (i.e., the sum of both primary and secondary shares sold). Initial returns residual is the residual from regressing the initial returns on the social tie measure between the issuer and the book managers. All the other independent variables are defined in Tables 1, 2, and 3. Standard errors, reported in parentheses, are computed using heteroskedasticity-consistent standard errors. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

| | (1) | (2) |
|---|---|---|
| Intercept | 2.20<br>(1.22)* | 3.08<br>(1.34)** |
| Social ties to issuer | 0.37<br>(0.16)** | 0.36<br>(0.18)** |
| Initial return residual | | 6.10<br>(0.47)*** |
| Ln(IPO proceeds) | -0.05<br>(0.06) | -0.06<br>(0.07) |
| Float | -2.32<br>(0.34)*** | -3.69<br>(0.40)*** |
| Industry fixed effect | Yes | Yes |
| Year fixed effect | Yes | Yes |
| N | 1,346 | 1,346 |
| Adjusted $R^2$ | 0.15 | 0.39 |