Investment Banker Directors and Seasoned Equity Offerings*

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Abstract

We examine how directors with investment banking experience affect firms' capital raising activities. We find that firms with investment bankers on their boards have a higher probability of making seasoned equity offerings (SEOs), and that these offerings are associated with higher announcement returns, lower underpricing, and lower underwriter spreads. These results are consistent with the idea that investment banker directors reduce information asymmetry between issuers and the equity market. We find a limited role of investment banker directors in firms issuing bonds or obtaining loans, which are less information-sensitive than equity. Overall, our results highlight the advisory role of specialist directors in shaping corporate policies.

Keywords: Seasoned equity offerings; board of directors; investment banking experience; information asymmetry; advisory role of directors

JEL Classification: G14, G24, G32

I. Introduction

Much of the discussions on corporate boards has centered on their monitoring role, yet boards spend a significant portion of their time advising rather than monitoring (Adams and Ferreira (2007) and Adams, Hermalin, and Weisbach (2010)). This leads to some important questions: Which type of specialist directors can be expected to best serve their advising roles? How do specialist directors affect corporate policies?

One of the most common specialist directors on corporate boards in the United States is an investment banker (IB). Investment banks provide a wide range of services in the capital market. Their primary responsibility is to underwrite securities. They also provide advice about takeovers, provide earnings forecasts, make stock recommendations, and make a market for a company's securities. During our sample period 2000-2014, over a third of U.S. firms have directors who have had some investment banking experience. Despite the prevalence of investment banker (IB) directors on U.S. corporate boards, there is a lack of general understanding of their advisory role in corporate policies (with notable exceptions of Güner, Malmendier, and Tate (2008) and Huang, Jiang, Lie, and Yang (2014)). In this paper, using a large hand-collected data set on board composition of over 7,000 firms for the period 2001-2015, we examine whether and how the presence of this particular type of specialist directors, IB directors, is related to securities issuances and underwriting activities.

According to Eckbo, Masulis, and Norli (2007), only about one-half of newly public firms undertake a public security offering of any type (i.e., either debt or equity), and only about one-quarter undertake a seasoned equity offering (SEO). The relatively rare occurrence of SEOs is consistent with adverse selection costs driven by information asymmetry (Myers and Majluf (1984)) being an important consideration when firms raise cash externally. Lee and Masulis

(2009) document that SEO announcement returns range between -2% to -3%, and underwriting fees range between 3% to 8% of gross proceeds, suggesting that such information asymmetry contributes to a substantial part of SEO flotation costs, which represent an economically important portion of SEO gross proceeds.

We conjecture that there are a number of ways that IB directors could help mitigate information asymmetry between an issuer and the equity market. First, as board members, IB directors have regular access to the Chief Financial Officer (CFO) and/or the Chief Executive Officer (CEO) of a firm and with whom they could ask probing questions based on their capital market experience, thereby reducing information asymmetry among corporate insiders (the management and members of the board) and enabling them to be credible certifiers of firm value. Second, because IB directors have a similar professional background as the underwriters hired for capital raising activities, they speak the same language as the underwriters and can communicate more effectively their inside information about the issuer to the capital market. This helps improve the informational environment of the issuer and allows it to access capital markets more easily and cheaply. Third, with their own experience in investment banking, IB directors have superior knowledge about the industry that allows them to select underwriters that work the best with the issuer; they also have the expertise to negotiate fees for the underwriting services. Based on the above arguments, we expect that firms with IB directors do more SEOs, and more importantly, their SEOs are associated with more positive announcement returns and lower underwriter spreads.

Our empirical analysis proceeds in the following way. First, we start with both the BoardEx database and hand-matching to obtain information on whether a director has investment banking experience for 65,091 directors in 7,036 firms over the period 2000-2014. We find that

over the sample period, about a third of U.S. firms have IB directors. Second, we relate the presence of IB directors to firms' SEO activities by focusing on the propensity of doing an SEO, SEO announcement period returns, underpricing, and underwriter gross spreads. We find that when there are IB directors on their boards, firms are 13.8% more likely to do SEOs. Further, we find that for an average issuer in our sample, the presence of IB directors is associated with a 70 basis points higher two-day announcement returns, a 50 basis points lower underpricing, and a 5% decrease in gross spreads. In terms of economic significance, an average issuer in our sample has a market capitalization of $1.59 billion, a 70 basis points higher price reaction corresponds to value creation of $11.1 million; an average issue in our sample is $131 million, a 50 basis points lower underpricing corresponds to an increase in proceeds by $0.66 million; and a 5% decrease in underwriting fees corresponds to a savings of $0.33 million in fees to the issuers.

A key concern for any analysis of director effects is the endogeneity of board composition. In particular, there could be reverse causality: Instead of IB directors leading firms to do more SEOs, firms with funding needs may choose to hire directors with investment banking experience. We take a number of approaches to addressing this endogeneity concern.

First, we instrument for the presence of IB directors on corporate boards using directors' network—their exposure to IB directors on other boards. Our instrument is the fraction of non-IB directors on a board who sit (either now or in the past) on other boards on which there are IB directors. This captures the general connectedness of non-IB directors especially their exposure to IB directors on other boards.

Second, we identify and remove firm-year observations where IB directors have a tenure less than three years prior to the SEO offering to address the reverse causality concern that firms

strategically hire IB directors for subsequent SEOs. This ensures that IB directors are hired long before a firm's capital raising activities and the relation we identify is more likely to be causal.

Finally, in our analysis of offer performance such as underpricing and gross spreads, we always remove firm-year observations where conflicts of interest might play a significant role, that is, affiliated IB directors whose employers are the lead underwriters for the SEO. In all cases, our main findings of the effect of IB directors on SEOs remain unchanged or become stronger.

We explore possible economic mechanisms through which IB directors help improve firms' access to equity markets. We find that the presence of IB directors is associated with a significantly improved firm informational environment as measured by lower return volatility, better earnings quality, and smaller analyst forecast error. We further explore the role of IB directors in issuing securities that are less information-sensitive than equity, including corporate bonds and bank loans. We find IB directors play a limited role in the bond market and have no effect in the loan market. These results are consistent with IB directors reducing information asymmetry between issuers and investors when the pricing of those financial instruments is information-sensitive.

Finally, we conduct a number of robustness checks on our main findings. We implement the analysis using a sample of SEOs that include private placements of common equity. Our main findings remain unchanged. We use the volume and the number of SEO deals to capture the propensity of doing SEOs and find a similar relation between the presence of IB directors and the SEO volume. Using a different event window to measure SEO announcement returns, we still observe the same significant relation between the presence of IB directors and announcement returns.

Our paper contributes to the literature in a number of dimensions. First, our paper contributes to the growing finance literature that studies the advisory role of corporate directors. Güner, Malmendier, and Tate (2008) examine how directors with financial expertise affect corporate decisions including investment, mergers and acquisitions (M&As), bond issues, and CEO compensation, and conclude that financial expertise on boards may not benefit shareholders if conflicting interests are present. Huang et al. (2014) examine how directors with investment banking experience affect firms' acquisition behavior and find that firms with IB directors do more deals with higher announcement returns, lower takeover premiums and advisory fees, and better long-run performance. Huang et al. (2014) focus on the role of IB directors in M&As through better deal screening and negotiation, while our paper focuses on the role of IB directors in securities issuances through reducing information asymmetry. As such, our paper complements prior studies by highlighting a different advisory role of IB directors in one of the most important corporate policies—capital raising activities.

Second, our paper also contributes to the literature that examines the relation between personal characteristics of corporate decision makers and corporate policies starting with the seminal paper by Bertrand and Schoar (2003). For CEOs, there is evidence that their style (Adams, Almeida, and Ferreira (2005) and Bennedsen, Nielsen, Perez-Gonzalez, and Wolfenzon (2007)), personal characteristics, or personality traits (Malmendier and Tate (2005, 2008), Kaplan, Klebanov, and Sorensen (2012), Graham, Harvey, and Puri (2013), and Hirshleifer, Low, and Teoh (2012)), prior experience (Malmendier, Tate, and Yan (2011), Custodio and Metzger (2013, 2014), Benmelech and Frydman (2015), Bernile, Bhagwat, and Rau (2015), and Dittmar and Duchin (2016)), and gender (Huang and Kisgen (2013) and Tate and Yang (2015)) matter in corporate policies. For corporate directors, there is evidence that their expertise and

prior experience (Güner, Malmendier, and Tate (2008), Huang et al. (2014), and Adams, Akyol, and Vewijmeren (2015)), gender (Adams and Ferreira (2009), Ahern and Dittmar (2012), and Matsa and Miller (2013)), and board diversity (Bernile, Bhagwat, and Yonker (2016) and Giannetti and Zhao (2016)) matter in corporate policies. We contribute to the literature on director characteristics by providing new evidence on how directors' investment banking experience operates in their firms' capital raising activities.

Finally, our paper contributes to the voluminous SEO literature. The questions of why we observe SEO underpricing and how to reduce it are still not fully answered (see, for example, Altınkılıç and Hansen (2003), Corwin (2003), and the survey by Eckbo, Masulis, and Norli (2007)). Possible explanations include information asymmetry (Myers and Majluf (1984), and Lee and Masulis (2009)), price pressure (Scholes (1972)), manipulative trading (Gerard and Nanda (1993)), transaction cost savings (Loderer, Sheehan, and Kadlec (1991)), and underwriter pricing practices such as offer-price rounding and pricing at the bid (Lee, Lochhead, Ritter, and Zhao (1996)). Our paper adds to this literature by showing that one important way to mitigate information asymmetry in SEOs is to have some capital market expertise on the issuer's board.

The remainder of the paper is organized as follows. In Section II we discuss sample formation and provide a sample overview. We examine the role of IB directors in capital raising activities in Section III. We investigate the underlying mechanisms and provide suggestive evidence on post-SEO operating and stock performance in Section IV, and conduct additional investigation in Section V. We conclude in Section VI.

II. Sample Formation and Overview

A. Identifying IB directors

The data for our analyses are collected from multiple sources. We start with all U.S. publicly traded industrial firms (after removing financial (SIC 6000-6999) and utilities (SIC 4910-4940) firms) for the period 2000–2014 from the CRSP/Compustat merged database. To obtain directors' background information, we merge the sample with the BoardEx database, which provides extensive biographical information, such as employment history and educational background, of corporate directors and senior executives in public and major private firms. We match CRSP/Compustat with BoardEx based on firm identifiers and firm names. We also manually check all matches and make necessary adjustment to ensure each CRSP/Compustat firm is associated with a unique identifier in BoardEx. Our matching procedure yields a sample of 7,036 unique firms and 61,167 firm-year observations.

To identify directors with investment banking experience, we first rank all investment banks based on the aggregate deal value of M&As made by U.S. acquirers that they have advised and equity and bond issues that they have underwritten over the period 1980-2014. We take the 100 most active investment banks by the aggregate deal value and manually match their names with employer names given in the BoardEx Employment History file.[1] When matching, we account for name changes, mergers and acquisitions, and parent-subsidiary relationships among investment banks. In the case of financial conglomerates, we use their investment banking arm to identify investment banking experience whenever possible.

A director serving on the board of a public firm is identified as an IB director if she is an independent director and is holding, or at some point in her career, has held a senior position at any of these top 100 investment banks. We define senior position as a top executive position (e.g., CEO, CFO, Chairman or President) or a senior manager position (e.g., managing director,

[1] The 100 most active investment banks are involved in 91% of the aggregate deal value over the period 1980-2014. Our main findings are unchanged if we use the 50 or 150 most active investment banks.

regional CEO/CFO, group executive, or executive president). Junior job titles, such as divisional vice president, analyst, associate, and consultant, are excluded.

Table 1 provides a list of the ten most active underwriters by the aggregate deal value and by the number of connected directors at public firms with whom they have shared an employment relation. As expected, there is a large overlap between the two lists. Figure 1 plots the time trend of IB directors on corporate boards. IB directors take up about 6% of the board seats in U.S. public firms and sit on the boards of more than a third of these firms. These numbers have been steadily increasing over the past decade, suggesting an increasing importance of IB directors to U.S. firms.

B. The SEO sample

To examine the role of IB directors in a firm's equity market capital raising activities, we start with all U.S. SEOs over the period 2001-2015, collected from the Securities Data Company's (SDC) Global New Issues database. We remove issues made by financial (SIC 6000-6999) and utilities (SIC 4910-4940) companies, require issues to be common stock made by U.S. firms listed on the NYSE, AMEX, or NASDAQ, and exclude units, right offerings, Real Estate Investment Trusts (REITs), and closed-end funds. We also exclude withdrawn offerings and pure secondary offerings (or offerings where the information on the percentage of secondary shares issued is missing). Finally, we remove issues with offer price less than $1.00 to ensure that our results are not driven by small firms and to prevent bid-ask bounce from contaminating our analysis on floatation costs later (Blume and Stambaugh (1983)). Our main SEO sample consists

of 2,508 deals, three-quarters of which have Rule 415 Shelf Registrations.[2] Table 2 Panel A lists the steps taken to form our SEO sample.[3]

Table 2 Panel B presents the distribution of SEO deals over time. It shows a big spike in SEO activities in 2009 that coincides with the end of the financial crisis and the beginning of economic recovery. The temporal pattern in SEOs around the financial crisis is also confirmed by Kahle and Stulz (2013).

Announcement period return (CAR) is the cumulative market-adjusted return around the SEO filing date.[4] We estimate CAR over the event window (0, 1),[5] using the market model over a 200-day period ending 11 days before the filing date (day 0) with the return on the CRSP value-weighted index as the market return.

Underpricing is defined as negative one times the close-to-offer return. This variable is constructed in such a way that underpricing is positive when the offer price is less than the prior day's closing price. Prior work has shown that many SEOs take place after the close of trading (Safieddine and Wilhelm (1996), Altınkılıç and Hansen (2003), and Corwin (2003)). Following prior research, we use a volume-based adjustment method to correct for errors in the offer date. In particular, if trading volume on the day after the SDC offer date is more than twice the trading

[2] In March 1982, the Securities and Exchange Commission (SEC) adopted Rule 415 Shelf Registration, which enabled public companies to sell securities more quickly. Under the Rule, issuers register securities that can be sold over a two-year period, with offer terms at each sale set based on current market conditions and other factors. In practice, the SEC has allowed shelf registration statements to remain effective for many years. Since 2005, Rule 415 no longer limit the amount of securities registered on a shelf registration statement to an amount intended to be offered and sold, but limit the term of each shelf registration to be three years.

[3] As a robustness check, our secondary SEO sample consists of 3,168 deals that include private placements of common stock and Rule 144A resale of securities to qualified institutional buyers. Our main findings remain unchanged.

[4] About three-quarters of the SEOs in our sample are made under the shelf registration. As such, there would be one formal filing with the SEC and multiple issues after the filing. CAR is measured at the filing (not at the issuance) following prior literature (Jegadeesh, Weinstein, and Welch (1993), Denis (1994), Datta, Iskandar-Datta, and Roman (2005), Ferreira and Laux (2016)). The Heckman specification is based on the filing date as well.

[5] A search of the Factiva and CapitalIQ database indicates that the announcement day is either the filing day (usually after market close) or the day following the filing day. Following Ferreira and Laux (2016), our announcement window covers both the filing day (day 0) and the day after (day 1).

volume on the SDC offer date and more than twice the average daily volume over the 250 trading days prior to the SDC offer date, then the day following the SDC offer date is used as the "correct" offer date.

Gross spread is the dollar gross spread divided by the total proceeds. The dollar gross spread is the difference between the offer price and the price at which the underwriting syndicate buys shares from the issuer times the number of shares to be issued. The spread is shared among the book managers, co-managers, and the selling syndicate, and includes the management fee (payable to the book managers), the underwriting fee (payable to co-managers), the selling concession (payable to the selling syndicate), and the reallowance fee (payable to secondary sellers of the securities).

In Panel C, we report summary statistics for key deal and firm characteristics for our SEO sample. The numbers are largely in line with other SEO studies (see, for example, Kim and Park (2005), Lee and Masulis (2009), and Ferreira and Laux (2016). In Panel D, we compare deal and firm characteristics for the two subsample of SEOs partitioned by the presence of IB directors on the issuer's board. We find that SEOs with IB directors have on average higher announcement returns, lower underpricing, and lower underwriter spreads. Given that omitted variable bias in univariate correlations can mask the true relations between the variables, we will employ regression analysis to examine the factors associated with SEOs.

C. Sample overview

Table 3 presents summary statistics for the panel of 37,844 firm-year observations used to examine the SEO propensity. Detailed definitions of the variables are given in the Appendix. All continuous variables are winsorized at their 1st and 99th percentiles to reduce the influence of outliers, and all dollar values are adjusted to 2015 dollars. Panel A presents summary statistics

for the full sample. We show that about 40% of the sample firms have IB directors. By comparison, over 80% of the directors are independent. Other firm characteristics are typical of the Compustat population.

Panel B presents the mean and median values of key firm characteristics for two subsamples of firms partitioned by the presence of IB directors. We show that firms in these two subsamples have statistically (if not economically) different characteristics. For example, firms with IB directors have more independent directors (not surprisingly as IB directors are independent), and are larger, older, and more likely to be rated than firms without IB directors. Panel C presents the correlation matrix (based on the variables in Panel A), suggesting little problem of multicollinearity.

III. The Role of IB Directors in SEOs

A. IB directors and the SEO propensity

To explore the impact of IB directors on a firm's equity market capital raising activities, we first investigate whether IB directors affect firms' likelihood of doing SEOs. We estimate a probit regression where the dependent variable, *SEO*, is an indicator variable that takes the value of one if a firm makes at least one SEO in the year, and zero otherwise. The variable of interest is an indicator variable, *IB Director*, that takes the value of one if a firm has at least one IB director in the prior year, and zero otherwise. We control for board monitoring using the fraction of independent directors to make sure that our IB director results are not driven by (omitted) board characteristics. To ensure that our results are not driven by inter-board linkages, we control for the SEO activities of industry peer firms that are connected by interlocking directors, which captures potential SEO peer effects. We also control for the presence of directors sitting on

boards of capital providers (SIC 6000-6299, including depository institutions, non-depository credit institutions, and security and commodity brokers, dealers, exchanges, and services) to make sure that our results are not driven by board connections with SEO underwriters or investors. Finally, we control for a number of known determinants of a firm's propensity to do a SEO, including firm size, firm age, ROA, dividend payer, Tobin's Q, prior year return, prior year SEO, leverage, rated, tangibility, cash holdings, capital expenditures, as well as year and industry fixed effects (see, for example, Corwin (2003) and Eckbo, Masulis, and Norli (2007)).

Table 4 Panel A column (1) presents the probit regression results in terms of marginal effects. The estimated coefficients of the control variables all exhibit the expected signs. Smaller firms, younger firms, underperforming firms, non-dividend payer, and firms with higher Tobin's Q, higher prior year returns, prior year SEOs, higher leverage, credit ratings, higher cash holdings, and higher capital expenditures are more likely to do SEOs. Importantly, we find that the marginal effect of *IB Director* is 0.008 and is statistically significant at the 1% level. The effect of IB directors on the SEO propensity is also economically meaningful. *Ceteris paribus*, firms with IB directors on their boards are 0.8 percentage points more likely to do an SEO than firms without, which is a 13.8% increase compared with the average SEO propensity in our sample of 5.8 percentage points.[6] It is worth noting that the marginal effect of having IB directors on a board is about as large as the marginal effect of a one standard deviation increase in capital expenditures (or two standard deviation increase in Tobin's Q).

[6] We also examine whether our results are affected by differences in firm characteristics between firms with and without IB directors using a propensity score matching approach (Rosenbaum and Rubin (1983)). We estimate the propensity score using a set of covariates that includes firm size, firm age, ROA, dividend payer, Tobin's Q, prior year return, prior year SEO, leverage, rated, tangibility, cash holdings, capital expenditures, and firm industry. We then identify two groups of firms that are virtually indistinguishable from one another except for the presence of IB directors on their boards. Our results are the same after adjusting for covariate differences between these two groups.

While our results are consistent with the hypothesis that IB directors help firms reduce information asymmetry, thus leading to easier and cheaper access to capital markets, a potential concern is endogeneity, i.e., IB directors are not randomly assigned and the presence of IB directors could be related to firms' unobserved growth opportunities or needs for funding. The evidence so far is also consistent with a reverse causality interpretation. Consider a firm with funding needs and equity issuance is costly. Realizing that information asymmetry between corporate insiders and outside investors could be severe, the firm could appoint a capital market expert, such as an IB director, to its board to facilitate those planned fund raising activities.

To address the potential endogeneity concern, we adopt an instrumental variable approach. Our instrumental variable for the presence of IB directors on a board follows Adams and Ferreira (2009) and is the fraction of non-IB directors on a board who sit or have sat on boards on which there are IB directors. The network of non-IB directors on other boards includes all firms covered by BoardEx, i.e., both public and large private firms. We expect this instrument to meet the relevance condition—it captures the degree to which non-IB directors are connected to IB directors and therefore appreciate the role of IB directors on a corporate board. In the meantime, these non-IB directors' network on other boards is unlikely related to their home firms' funding needs and/or investment opportunities, especially after we have controlled for the SEO activities of interlocked peer firms (the exclusion restriction).

Angrist (2001) and Angrist and Krueger (2001) point out that when the endogenous regressor is binary, using the predicted probability from a nonlinear model in the second stage does not generate consistent estimates unless the nonlinear model is exactly correct. Therefore, we estimate a recursive bivariate probit model, which assumes that the binary dependent and independent variables are each determined by latent linear models with jointly normal error

terms (Evans and Schwab (1995)). In this model, the probit equations on the indicator variable *IB Director* and the indicator variable *SEO* are estimated simultaneously using the maximum likelihood method, where the instrument is used in predicting IB directors' presence.[7]

Table 4 Panel A column (2) presents results of the biprobit regression in terms of marginal effects. For brevity, we present the full regression results from the second-stage regression, as well as the coefficient on the instrument in the first-stage regression (Table IA1 in the Internet Appendix presents the full results of the first-stage regressions). We note that our instrument is positively and significantly associated with a firm's likelihood of having an IB director on its board at the 1% level. More importantly, after instrumentation, we show that firms with IB directors are 2.8 percentage points more likely to do SEOs than firms without.

For comparison, we also estimate a standard two-stage least squares (2SLS) regression with our instrument, assuming both binary outcome variables to be linear. Table 4 Panel A column (3) presents the results. We show that the coefficient on the indicator variable *IB Director* is positive and significant at the 1% level, confirming the positive effect of IB directors on a firm's SEO propensity. Lastly, in column (4), we present the 2SLS estimation with firm fixed effects. IB directors continue to be positively and significantly associated with a firm's propensity to do an SEO after absorbing time-invariant firm-level heterogeneities. A direct inference of the magnitude of the coefficient is that firms with IB directors are 5-7 percentage points more likely to make SEOs. However, we caution against such a direct inference, because

[7] In our current setting, the latent linear model can be specified as follows:

$$\begin{cases} y_1^* = \beta_1 X_1 + \varepsilon_1,\ y_1 = 1 \ \ for\ y_1^* > 0 \\ y_2^* = \beta_2 X_2 + \gamma y_1^* + \varepsilon_2,\ y_2 = 1 \ \ for\ y_2^* > 0 \end{cases}$$

where y_1 and y_2 represent the presence of IB directors and SEO activities, respectively. When the error terms ε_1 and ε_2 are uncorrelated, both equations can be estimated separately as single probit models, but when the error terms might be correlated, a bivariate probit model is required. Greene (1998, 2002) shows that the endogeneity of y_1 does not affect the likelihood of the bivariate probit.

2SLS can produce predicted values that are out of bounds when a model has both a binary dependent variable and binary explanatory variables. Instead, we rely on probit and bivariate probit estimates to infer the marginal effect of IB directors on a firm's SEO propensity, because these estimates are considered more appropriate and efficient in a setting like ours (Greene (1998) and Chiburis, Das, and Lokshin (2012)).

To address the potential reverse causality concern, we identify and remove firm-year observations where IB directors have a tenure less than three years prior to the SEO offering.[8] This removes about 15% of the sample. In this case, IB directors are hired long before a firm's capital raising activities and the relation we identify is more likely to be causal. Table 4 Panel B presents the results. Our main findings on the positive association between IB directors and a firm's SEO propensity remain unchanged.

Next, we also remove around 5% of firm-year observations where conflicts of interest might be the driver behind the SEO decision, that is, affiliated IB directors whose (former) employers are the lead underwriters for the SEO. Untabulated results show that our main findings remain unchanged after removing those firm-year observations.[9]

B. IB directors and SEO announcement returns

If IB directors help reduce information asymmetry about SEO issuers, we expect firms with such directors to receive more favorable price reactions at the time of SEO announcements.

[8] Our main findings remain unchanged if we require IB directors to have tenure of at least six years, i.e., two election cycles away from the SEO offerings (for staggered boards).

[9] If investment banking experience is a required attribute for director appointment, directors who join the board before gaining investment banking experience should be free of such endogeneity concerns. We therefore limit the SEO propensity tests to a subsample of IB directors who gain investment banking experience after joining the board. However, only 1.9% of the firms have this type of IB directors. The sample is too small to generate any significant effect.

In this section, we examine whether issuers experience higher abnormal announcement returns when they have at least one IB director on their boards.

Table 5 Panel A lists the steps taken to form the SEO sample to study announcement returns. Table 2 Panel D shows that the mean/median SEO announcement returns (*CAR*) for the full sample is negative (-2%). When we separate the sample based on the presence of IB directors on the issuers' boards, we show that the mean/median CAR for SEO firms with IB directors are significantly different from those for SEO firms without IB directors. This suggests that unconditionally, the presence of IB directors is associated with an increase in issuer shareholder wealth upon the SEO announcement, consistent with our conjecture on the role of IB directors in the capital market.

Next, we estimate regressions of SEO announcement returns, controlling for known determinants documented in previous studies (Lee and Masulis (2009) and Ferreira and Laux (2016)). The set of control variables includes both firm and SEO deal characteristics, such as firm size, prior year return, relative size (of the issue to the issuer market capitalization), and the percent of secondary offering. We also control for year and industry fixed effects in all of our regressions.

Table 5 Panel B presents the regression results. In column (1), where the regression specification is OLS, we show that the coefficient on the indicator *IB director* is positive and significant at the 5% level. The presence of IB directors increases the issuers' two-day CAR by 70 basis points compared to the sample average of –200 basis points. In terms of economic significance, the average market capitalization for SEO issuers in the sample is $1.59 billion, so a 70 basis point increase corresponds to $11.1 million value creation to the shareholders of a

typical issuer. This effect is similar in magnitude to the effect of a one standard deviation increase in share turnover (a proxy for stock liquidity).

To control for potential self-selection bias whereby a firm's SEO decision might be influenced by management's expectations of the market reaction to the announcement (Li and Prabhala (2007)), we employ a two-stage Heckman selection model (Heckman (1979)). In the first stage, we estimate a probit regression of the SEO propensity using the same specification as in Table 4 Panel A column (1). In the second stage, we add the Inverse Mills ratio as an additional control variable in our estimation of SEO announcement returns. Panel B column (2) presents the results. We show that the coefficient on the indicator *IB Director* is positive and significant at the 10% level and with a similar magnitude as that in column (1) without controlling for selection. The coefficient on the inverse Mills ratio is insignificant, suggesting little evidence of selection. We conclude that firms with IB directors are associated with higher SEO announcement returns.[10]

C. IB directors and SEO underpricing

The univariate statistics in Table 2 Panel D show that SEOs made by issuers with IB directors on their boards are significantly less underpriced than their counterparts without IB directors.

Table 6 presents the regression results when the dependent variable is SEO underpricing. We control for known determinants of SEO underpricing documented in previous studies (Loderer, Sheehan, and Kadlec (1991), Jegadeesh, Weinstein, and Welch (1993), Altınkılıç and

[10] When examining CAR, we do not employ a 2SLS specification as the outcome variable CAR is forward looking and thus reverse causality is unlikely to be a big concern: Even if firms appoint IB directors in anticipation of their funding needs and capital raising activities, it is still consistent with our argument that IB directors add value (and managers are aware of it).

Hansen (2003), and Corwin (2003)). In column (1) where the regression specification is OLS, we show that the coefficient on the indicator *IB director* is negative and significant at the 5% level. The presence of IB directors reduces SEO underpricing by 50 basis points compared to the sample average of 400 basis points. This effect is similar in magnitude to the effect of a one standard deviation decrease in stock return volatility. In terms of economic significance, given an average issue size of $131 million in our sample, a 50 basis point decrease in underpricing corresponds to $0.66 million value creation to a typical issuer. We also note that other control variables have similar effects on SEO underpricing as prior work has shown: SEOs whose issuers have lower return volatility, lower price run-up leading to the issue, higher priced stock, and more analyst coverage are associated with lower underpricing.

Column (2) presents the second-stage regression results controlling for selection in SEO decisions. We show that the coefficient on the indicator *IB Director* is negative and significant at the 5% level and with a similar magnitude as that in column (1) without controlling for selection. We obtain similar results after instrumenting *IB Director* in a 2SLS specification (column (3)) and in a subsample that excludes firm-year observations where the IB director's tenure on the board is less than three years (column (4)). We conclude that firms with IB directors are associated with smaller SEO underpricing.

D. IB directors and gross spread

The univariate statistics in Table 2 Panel D also show that issuers with IB directors on their boards are charged a significantly lower spread on their SEO deals than those without IB directors.

Table 7 presents the regression results when the dependent variable is the natural logarithm of SEO gross spread in percentage points following Butler, Grullon and Weston

(2005). We control for known determinants of SEO gross spreads documented in previous studies (Lee and Masulis (2009) and Butler, Grullon and Weston (2005)), as well as year and industry fixed effects. In column (1) where the regression specification is OLS, we show that the coefficient on the indicator *IB director* is negative and significant at the 5% level, and the presence of IB directors reduces the issuer's underwriting fees by 5%. In terms of economic significance, with an average issue size of $131 million and an average gross spread of 5.1 percentage points in our sample, a 5% decrease in underwriting fees corresponds to a savings of $0.33 million in fees to a typical SEO issuer (= 131 × 0.051 × 0.05); this effect is larger than that of a one standard deviation increase in *log (Stock price)*. We further note that, consistent with prior studies, SEOs whose issuers are larger, have better performance and credit ratings, higher priced stock, larger deals, and deals with fewer book runners are associated with lower gross spreads.

Column (2) presents the second-stage regression results controlling for selection in SEO decisions. We show that the coefficient on the indicator *IB Director* is negative and significant at the 5% level and with a similar magnitude as that in column (1) without controlling for selection. Columns (3) and (4) present the instrumented 2SLS regressions for the full sample and for a subsample that excludes firm-year observations where the IB director's tenure on a board is less than three years, respectively. We conclude that firms with IB directors are associated with lower gross spreads.

In summary, we present evidence that the presence of IB directors on boards is associated with a higher SEO propensity, higher announcement returns, less underpricing, and lower gross spreads. These findings are consistent with IB directors reducing information asymmetry

between issuers and the capital market. In the next section, we further explore the channels as well as the implications of IB directors for firm policies and performance.

IV. Underlying Mechanisms and Policy and Performance Implications

A. Underlying mechanisms

If IB directors are effective communicators of firm value to capital markets, we expect their presence to improve firms' informational environments, which in turn leads to more frequent SEOs and lower floatation costs (Taggart (1977), Choe, Masulis and Nanda (1993), Lee and Masulis (2009), and Billett and Yu (2016)).

Our first proxy for firm informational environment is stock return volatility following Billett and Yu (2016). With a more transparent informational environment, new information is promptly incorporated into stock prices, leading to less variation in stock returns. We expect the presence of IB directors leads to lower return volatility.

Our second proxy focuses on the quality of accounting information, and we use accrual quality following Lee and Masulis (2009). IB directors, very often (about 70% of the time in our sample), sit on the audit committee, and their presence can help firms to communicate their financial information to the broad capital markets in a more timely and effective manner. Prior work has shown that financial expertise on the audit committee is associated with better earnings quality (Defond, Hann, and Hu (2005)). Lee and Masulis (2009) show that poor accounting information quality raises uncertainty about a firm's financial condition for outside investors, lowers demand for a firm's stock, and raises underwriting costs and risk. We thus expect that another important channel for IB directors to have an effect on SEO decisions is that their presence is associated with a higher quality of accounting information.

Our third and final proxy is analyst forecast error. One potential mechanism through which IB directors help issuers get better access to capital markets is improved communication between management and financial intermediaries like analysts who are financial experts themselves. Having a similar professional background means the IB directors speak the same language as and can communicate more effectively with the analyst community. Custodio and Metzger (2014) find that firms whose CEOs have finance experience are associated with more accurate analyst forecasts. Similarly, we expect that IB directors could improve the accuracy of analyst forecasts, lowering the uncertainty surrounding SEOs.

Table 8 presents our investigation of the underlying mechanisms using the 2SLS regressions. Consistent with our conjecture, the coefficient on the indicator *IB director* is negative and significant at the 5% or lower level when the dependent variables are different proxies of firm informational environment, suggesting that the presence of IB directors helps reduce stock return volatility, improve earnings quality, and reduce analyst forecasts error.

In summary, we show that the positive effect of IB directors on SEO outcome variables is due to their ability in reducing information asymmetry between the issuer and capital markets.

B. Firm policies post SEOs

So far, we have shown that IB directors enable firms to access the capital market more easily and cheaply. As a result, the precautionary motive of holding cash becomes less important, and we would expect that firms with IB directors are more likely to spend the proceeds in valuable investments than hoarding them. To examine the real implications of firms having IB directors on corporate policies, we adopt two approaches.

The first approach uses matching firms. For each SEO firm with IB directors, we find a matching SEO firm without IB directors using the following algorithm: i) If there is at least one

SEO firm without IB directors in the same four-digit SIC industry in the same year, the one with the closest operating performance measured in year -1 is used (year 0 is the offer year); ii) if no matching firm is found, we then search for a match at a broader SIC level. We then compare post SEO firm policies between these two groups.

The second approach relies on industry-performance benchmarking. Specifically, we pair each SEO firm with a set of non-SEO firms that have the same SIC code (starting with four-digit SIC) and operating performance within 90% to 110% of the SEO firms' performance in year -1. Benchmark-adjusted measures are then calculated as the difference between the measures of the SEO firm and the median measures of the matching firms. We measure operating performance as operating income before depreciation (OIBD) scaled by sales. As pointed out by Barber and Lyon (1996), unlike measures based on earnings, OIBD mitigates the effects of different financing methods. Table 9 presents the results, where we compare the median changes in SEO firms' cash holdings, investment (Capex + R&D), and operating performance for two subsamples grouped by the presence of IB directors or not from year +1 up to year +3 relative to year -1.

Consistent with our conjecture on the role of IB directors in firm policies, Panel A shows that post SEOs, firms with IB directors hold less cash and invest more than their matched peers without IB directors. These findings are consistent with the notion that IB directors help firms relax their financial constraints, leading to less (precautionary) cash holdings and more real investment. Supporting the above findings, we find that IB directors have performance implications: SEO firms with IB directors significantly outperform their peers without IB

directors in terms of operating performance. Panel B shows similar results when we compare median changes in benchmark-adjusted measures for SEO firms with and without IB directors.

C. Long-run buy-and-hold abnormal returns

We next examine whether firms with IB directors outperform other firms in terms of long-run abnormal stock performance after SEO. Specifically, we analyze the market-adjusted returns, Fama-French adjusted returns, and benchmark-adjusted returns over three years after the offer date. To calculate the Fama-French adjusted buy-and-hold abnormal returns (BHARs) we first regress monthly returns on the Fama-French three factors using five years of data leading up to the SEO, and then use the estimated coefficients to calculate monthly abnormal returns before compounding (Kothari and Warner (1997)). To obtain benchmark-adjusted returns, we follow Barber and Lyon (1997) and calculate abnormal returns as the return of the SEO firm less the return on a control firm, which is chosen among all firms that have market values of equity between 70% and 130% of that of the SEO firm and whose book-to-market ratio is closest to that of the SEO firm. Table 10 presents the results.

We show that SEO firms with IB directors outperform other SEO firms in a statistically significant and economically meaningful way. Take Fama-French BHARs as an example, over a one-year horizon starting at the offer date, SEO firms with IB directors outperform those without by 8%, and the outperformance goes up to 16% over a three-year horizon.

Overall, we provide evidence suggesting that IB directors improves firms' access to equity market, leading to less cash hoarding, more timely investments, and better performance.

V. Additional Investigation

In this section, we conduct a number of robustness tests on our main findings, explore alternative explanations for our main findings, and examine the role of IB directors in other capital raising activities.

A. Robustness checks and alternative explanations

First, we re-do our analysis of the SEO propensity in Table 3 using different measures of SEO activity. Table IA2 in the Internet Appendix presents the results. We show that using a number of volume-based measures to capture SEO activity, the positive effect of IB directors remains.

Second, we examine whether and how IB directors affect issue size. IB directors help reduce information asymmetry, leading firms to raise capital more frequently and more cheaply. As a result, firms might not need to lump their issues to benefit from economies of scale. This channel suggests that there is either no or a negative association between the presence of IB directors and the size of SEO issues. Table IA3 presents the results where the dependent variable is the size of SEO deal. We show that the presence of IB directors is not significantly associated with the size of the SEO deal, as measured by both the absolute and normalized net proceeds. It is clear that our main findings are not driven by SEO deal size.

Finally, we rule out an alternative explanation of our results, i.e., IB directors have superior abilities to time the market, thereby making firms more likely to conduct SEOs. First, our results on long-run stock performance are inconsistent with the market timing story: If firms with IB directors are more likely to time the market, their long-run stock performance post SEO should be lower instead of higher (Loughran and Ritter (1995) and Baker and Wugler (2000)). We then directly test for market timing in Table IA4. We find that firms with IB directors are not

more likely to issue equity when prior year stock return is high, suggesting that IB directors do not have superior abilities to time the market.

B. IB directors and debt markets

We further explore the heterogeneity in the role of IB directors in capital raising activities across different security types. If the effect of IB directors operates primarily through reducing information asymmetry, such effect should be weaker in securities that are less information-sensitive in the first place. Among different securities, common equity is the most sensitive to information asymmetry between corporate insiders and the capital market, while corporate bonds and bank loans are less information-sensitive. We thus expect IB directors to have less of an effect on the issuance and pricing of bonds and loans. Consistent with our conjecture, we find some weak effects of IB directors on a firm's propensity to issue bonds (Table IA5) and no significant effect on bond spreads at issuance (Table IA6). We also find no effect of IB directors on a firm's propensity to obtain bank loans or the cost of bank loans (Tables IA7 and IA8). These results are consistent with the ordering of equity (the most information-sensitive), corporate bonds, and bank loans (the least information-sensitive) along the spectrum of the sensitivity to information asymmetry across different security types. Moreover, these results also help rule out alternative explanations such as conflicts of interests or reverse causality for our IB director results in SEOs, as these explanations should also apply for corporate bonds and bank loans.

Overall, these results are consistent with IB directors improving firms' access to capital markets when the potential for information asymmetry is severe.

VI. Conclusions

We examine whether and how directors with investment banking experience affect firms' capital raising activities. We find that firms with investment bankers on their boards have a higher propensity to do SEOs. Furthermore, issuers with IB directors experience higher announcement returns and lower underpricing, and they have lower gross spreads. We find some limited effect of IB directors on firms' issuances of corporate bonds and bank loans, which are less information-sensitive than equity. Overall, our results suggest that directors with investment banking experience help firms mitigate information asymmetry, resulting in better access to equity capital market. Our study highlights the advisory role of specialist directors in shaping corporate policies.

Appendix. Variable definitions

All Compustat firm characteristics are measured as of the fiscal year-end before the SEO announcement, and all continuous variables are winsorized at the 1st and 99th percentiles. All dollar values are in 2015 dollars.

Variables	Definitions
Dependent variables	
SEO	An indicator variable that takes the value of one if a firm does at least one SEO during the year, and zero otherwise. Source: SDC.
CAR	Two-day cumulative abnormal return over the SEO filing date (day 0) and the day after (day 1), calculated using the market model estimated over the 200-day period ending 11 days before the SEO filing date, with the return on the CRSP value-weighted index as the market return. Source: CRSP.
Underpricing	Negative one times the return from the closing price on the day prior to the offer date to the offer price. Source: CRSP.
Gross spread	Total compensation to IBs as a percentage of total SEO proceeds. Source: SDC
Stock return volatility	The standard deviation of monthly stock returns during the year. Source: CRSP.
Accrual quality	The standard deviation of the five most recent firm-specific residuals from the regression of total current accruals on lagged, contemporaneous, and leading cash flow from operations: $CA_{j,t} = c + \gamma_1 CFO_{j,t-1} + \gamma_2 CFO_{j,t} + \gamma_3 CFO_{j,t+1} + \nu_{j,t}$. CA (Total current accruals) = Δcurrent assets - Δcurrent liabilities + Δdebt in current liabilities – Δcash. CFO (Cash flow from operations) = earnings before extraordinary items - total accruals, where total accruals = total current accruals - depreciation and amortization. All variables are scaled by total assets. The regression is estimated annually for each two-digit SIC industry groups with at least 20 firms with available data for each of the past five years. Source: Compustat.
Analyst forecast error	The absolute difference between the actual annual earnings per share and the median analyst earnings forecast, scaled by actual earnings per share. Source: I/B/E/S.
Board characteristics	
IB director	An indicator variable that takes the value of one if there is at least one outside director on a board with investment banking experience, and zero otherwise. Source: BoardEx.
IB director (%)	The fraction of outside directors on a board with investment banking experience. Source: BoardEx.
Board size	The number of directors on a board. Source: BoardEx.
Board independence	The fraction of independent directors on a board. Source: BoardEx.
Connection to IB directors	The fraction of non-IB directors on the board who sit on other boards (either now or in the past) on which there are IB directors. Source: BoardEx.

Connection to capital providers	An indicator variable that takes the value of one if there is at least one director on a board who sits on the board of a capital provider (SIC 6000-6299). Source: BoardEx.
Firm characteristics	
Total assets	Total assets. Source: Compustat.
Firm age	The number of years since a firm first appeared in CRSP. Source: CRSP.
ROA	Net income /Total assets. Source: Compustat.
Dividend payer	An indicator variable that takes the value of one if a firm pays any dividend during the year, and zero otherwise. Source: Compustat.
Tobin's Q	(Total assets - Book value of equity + Market value of equity) / Total Assets. Source: Compustat.
Leverage	(Long-term debt + Debt in current liabilities)/ Total assets. Source: Compustat.
Prior year return	The annual return on the common stock of a firm. Source: CRSP.
Prior year SEO	An indicator variable that takes the value of one if a firm did SEOs in the past year, and zero otherwise. Source: SDC.
Interlocked peer SEO	An indicator variable that takes the value of one if a peer firm with interlocking directors makes SEOs during the year, and zero otherwise. Peers are first defined at the four-digit SIC level and if there are fewer than five peer firms (at the four-digit level) in the sample, we move up to three-digit SIC level and if there are fewer than five firms (at the three-digit level), we move up to two-digit SIC level. Source: SDC
Rated	An indicator variable that takes the value of one if a firm has credit ratings, and zero otherwise. Source: Compustat.
Tangibility	Net property, plant, and equipment /Total assets. Source: Compustat.
Cash	Cash and cash equivalent holdings /Total assets. Source: Compustat.
Capex	Capital expenditures/Total assets. Source: Compustat.
PreCAR	Five-day cumulative abnormal return relative to the market return ending the day prior to the offer date, where the return on the CRSP value-weighted index is the market return. Source: CRSP.
Stock price	The closing price on the day prior to the offer date. Source: CRSP.
Return std	The standard deviation of daily stock returns during the trading days -90 to -11 prior to the filing date (or offer date). Source: CRSP.
Share turnover	The average daily share trading volume during the trading days -90 to -11 prior to the filing date (or offer date), divided by the pre-SEO total number of shares outstanding. Source: CRSP.
#Analysts	The number of analysts issuing earnings forecasts. Source: I/B/E/S.
Cash flow volatility	The standard deviation of annual cash flows in the past ten years. Source: Compustat.
Operating performance	Operating income before depreciation (OIBD) scaled by sales. Source: Compustat.
SEO characteristics	
Relative size	The number of shares offered divided by the number of shares outstanding prior to the offer date. Source: SDC.

Secondary	The fraction of shares offered that are sold by existing shareholders. Source: SDC.
Underwriter ranking	The Carter and Manaster reputation measure in the year prior to the offer date. Source: Jay Ritter's website
#Bookrunners	The number of book runners involved in the SEO offer. Source: SDC.
IPO underpricing	The average underpricing of IPOs in the same month as the SEO offer. Source: Jay Ritter's website

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Figure 1. IB directors on corporate boards

This figure plots the presence of IB directors over time. A director is an IB director if she, at some point in her career, held a senior position at any of the one hundred most active investment banks over the period 1980-2014.

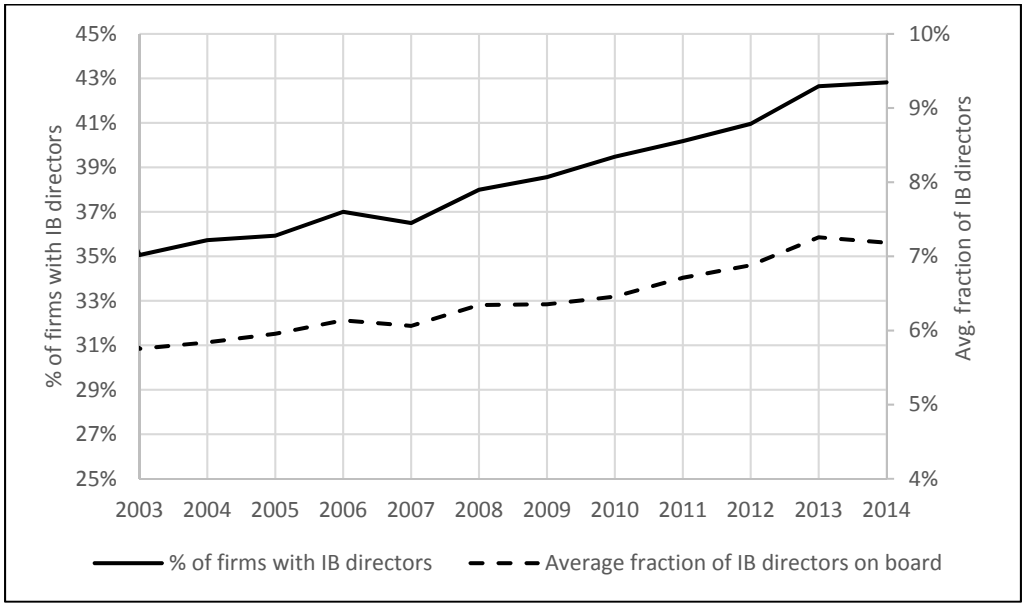

Table 1. Top ten investment banks

This table presents two ranking lists of investment banks. The first list is the ten most active investment banks in terms of the aggregate deal value that they advise (M&As) and/or underwrite (securities issuances) in the U.S. market over the period 1980-2014, based on data from SDC. The second list is the ten investment banks that have the largest number of connected directors at public firms with whom they once shared an employment relation.

Ranking	By aggregate deal values	By number of affiliated directors
1	Goldman Sachs	Goldman Sachs
2	Morgan Stanley	JP Morgan
3	JP Morgan	Citigroup
4	Merrill Lynch	Bank Of America
5	Credit Suisse	Morgan Stanley
6	Bank Of America	Merrill Lynch
7	Citigroup	Lehman Brothers
8	Lehman Brothers	Credit Suisse
9	Deutsche Bank	Deutsche Bank
10	UBS	UBS

Table 2. The SEO sample

This table presents summary statistics of the SEO sample, obtained from SDC's New Issues Database. The SEO sample consists of 2,508 offers over the period 2001-2015. Panel A presents the sample formation process. Panel B presents the distribution of SEOs by year. Panel C presents descriptive statistics for selected variables. Panel D presents the mean and median values of these variables for two subsamples of SEOs partitioned by the presence of IB directors. t-tests for the differences in mean values and Wilcoxon tests for the differences in median values are presented in the last two columns. Detailed variable definitions are provided in the Appendix. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Sample formation

	Number of deals
Total follow-on issuance by BoardEx-covered firms during 2001-2015	7,818
Exclude issues by utilities and financial firms	5,190
Common stocks (share codes 10 and 11) listed on NYSE, AMEX, and NASDAQ	4,644
Exclude units, rights offer, REITs, and closed-end funds	4,479
Exclude withdrawn cases	4,406
Exclude pure secondary offers (or no share information)	3,538
Offer price ≥ $1	3,168
Public offering	**2,508**
R415 Rule Shelf	1,884
Non-Shelf	624
Private placement	650
R144A resale	10

Panel B: SEOs over time

Year	Number of SEOs	Frequency (%)
2001	73	2.91
2002	75	2.99
2003	106	4.23
2004	182	7.26
2005	151	6.02
2006	157	6.26
2007	142	5.66
2008	81	3.23
2009	297	11.84
2010	206	8.21
2011	179	7.14
2012	200	7.97
2013	228	9.09
2014	223	8.89
2015	208	8.29
Total	2,508	100

Panel C: SEO and firm characteristic

	Obs.	Mean	Std	25th percentile	Median	75th Percentile
CAR	2,050	-0.020	0.062	-0.054	-0.020	0.007
Underpricing	2,254	0.040	0.041	0.011	0.030	0.057
Gross spread	2,143	0.051	0.014	0.045	0.055	0.060
Relative size	2,506	0.179	0.136	0.093	0.148	0.218
Secondary	2,508	0.069	0.197	0.000	0.000	0.000
Return std	2,504	0.042	0.024	0.027	0.036	0.050
Share turnover	2,504	0.014	0.015	0.005	0.009	0.016
PreCAR	2,254	-0.010	0.090	-0.061	-0.014	0.032
Stock price	2,254	19.620	24.510	5.040	12.855	25.590
IPO underpricing	2,254	0.137	0.097	0.079	0.123	0.193
#Analysts	2,508	7.678	7.693	2.000	6.000	11.000
#Bookrunners	2,507	1.544	0.934	1.000	1.000	2.000
Underwriter ranking	2,165	6.934	2.909	6.001	8.001	9.001

Panel D: Mean and median values for SEO and firm characteristics across subsamples

	SEOs with IB directors			SEOs without IB directors			Test of difference	
	Obs.	Mean	Median	Obs.	Mean	Median	T-test	Wilcoxon test
CAR	793	-0.018	-0.017	1,257	-0.028	-0.023	***	***
Underpricing	879	0.037	0.028	1,375	0.043	0.030	***	**
Gross spread	831	0.049	0.050	1,312	0.053	0.055	***	***
Relative size	998	0.171	0.142	1,508	0.184	0.153	*	**
Secondary	998	0.079	0.000	1,510	0.061	0.000	**	*
Return std	997	0.039	0.034	1,507	0.044	0.037	***	***
Share turnover	997	0.013	0.009	1,507	0.014	0.009		
PreCAR	879	-0.014	-0.014	1,375	-0.008	-0.014		
Stock price	879	21.701	15.090	1,375	18.298	11.610	***	***
IPO underpricing	879	0.138	0.122	1,375	0.136	0.125		
#Analysts	998	8.798	7.000	1,510	6.938	5.000		
#Bookrunners	998	1.709	1.000	1,509	1.435	1.000	***	***
Underwriter ranking	901	7.137	8.501	1,264	6.789	8.001	***	***

Table 3. Summary statistics

This table presents summary statistics of the sample used in SEO propensity analysis. The sample consists of 37,844 firm-year observations by merging CRSP, Compustat, and BoardEx databases over the period 2001-2015. Panel A presents descriptive statistics for the full sample. Panel B presents the mean and median values of firm characteristics for two subsamples of firms partitioned by the presence of IB directors. t-tests for the differences in mean values and Wilcoxon tests for the differences in median values are presented in the last two columns. Panel C presents the correlations among variables. Detailed variable definitions are provided in the Appendix. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Summary statistics

	Full sample (N = 37,844)				
	Mean	P25	Median	P75	Std
SEO	0.058	0.000	0.000	0.000	0.233
IB director	0.387	0.000	0.000	1.000	0.487
IB director (%)	0.064	0.000	0.000	0.125	0.095
Board independence	0.808	0.750	0.833	0.875	0.102
Connection to IB directors	0.307	0.111	0.286	0.500	0.245
Interlocked peer SEO	0.024	0.000	0.000	0.000	0.153
Connection to capital providers	0.247	0.000	0.000	0.000	0.431
Log (Total assets)	6.284	4.878	6.280	7.640	1.983
Firm age	17.821	7.000	14.000	26.000	13.935
ROA	-0.050	-0.042	0.032	0.076	0.332
Dividend payer	0.327	0.000	0.000	1.000	0.469
Tobin's Q	2.166	1.187	1.599	2.418	1.910
Prior year return	0.177	-0.210	0.071	0.391	0.674
Prior year SEO	0.057	0.000	0.000	0.000	0.232
Leverage	0.208	0.006	0.156	0.323	0.231
Rated	0.301	0.000	0.000	1.000	0.459
Tangibility	0.245	0.066	0.163	0.355	0.232
Cash	0.222	0.039	0.130	0.328	0.240
Capex	0.051	0.015	0.031	0.061	0.061

Panel B: Mean and median values for board and firm characteristics between subsamples

	Firm-year with IB directors (N = 14,645)		Firm-year without IB directors (N = 23,199)		Test of difference	
	Mean	Median	Mean	Median	T-test	Wilcoxon test
SEO	0.060	0.000	0.056	0.000	*	*
IB director	1.000	1.000	0.000	0.000	-	-
IB director (%)	0.165	0.143	0.000	0.000	***	***
Board independence	0.826	0.857	0.796	0.833	***	***
Connection to IB directors	0.401	0.400	0.247	0.200	***	***
Interlocked peer SEO	0.023	0.000	0.025	0.000		
Connection to capital providers	0.328	0.000	0.196	0.000	***	***
Log (Total assets)	6.880	6.860	5.907	5.905	***	***
Firm age	18.405	14.000	17.452	14.000	***	***
ROA	-0.027	0.035	-0.064	0.030	***	***
Dividend payer	0.375	0.000	0.297	0.000	***	***
Tobin's Q	2.094	1.589	2.211	1.607	***	
Prior year return	0.174	0.082	0.179	0.063		***
Prior year SEO	0.060	0.000	0.055	0.000	*	*
Leverage	0.247	0.209	0.183	0.120	***	***
Rated	0.412	0.000	0.231	0.000	***	***
Tangibility	0.271	0.182	0.229	0.152	***	***
Cash	0.195	0.104	0.240	0.149	***	***
Capex	0.054	0.033	0.049	0.029	***	***

Panel C: Pearson correlation

Variable	SEO	IB director	IB director (%)	Board independence	Connections to IB directors	Interlocked peer SEO	Connection to capital providers	Log (Total assets)	Firm age	ROA	Dividend payer	Tobin's Q	Prior year return	Prior year SEO	Leverage	Rated	Tangibility	Cash	Capex
SEO	1.00																		
IB director	0.01	1.00																	
IB director (%)	0.02	0.84	1.00																
Board independence	0.00	0.14	0.11	1.00															
Connection to IB directors	0.00	0.31	0.18	0.36	1.00														
Interlocked peer SEO	0.12	-0.01	-0.01	0.06	0.10	1.00													
Connection to capital providers	-0.05	0.15	0.09	0.16	0.35	-0.05	1.00												
Log (Total assets)	-0.10	0.24	0.15	0.25	0.51	-0.05	0.35	1.00											
Firm age	-0.11	0.03	-0.04	0.15	0.19	-0.09	0.22	0.33	1.00										
ROA	-0.17	0.05	0.03	0.02	0.08	-0.12	0.12	0.38	0.17	1.00									
Dividend payer	-0.11	0.08	0.02	0.09	0.21	-0.08	0.24	0.41	0.42	0.23	1.00								
Tobin's Q	0.13	-0.03	-0.03	-0.06	-0.02	0.11	-0.06	-0.22	-0.17	-0.29	-0.11	1							
Prior year return	0.05	0.00	-0.01	-0.03	-0.02	0.01	-0.01	0.00	0.00	0.15	-0.01	0.08	1.00						
Prior year SEO	0.18	0.01	0.02	0.01	0.00	0.12	-0.05	-0.06	-0.10	-0.12	-0.12	0.02	0.08	1.00					
Leverage	0.03	0.14	0.14	0.08	0.13	0.00	0.09	0.27	0.02	-0.07	0.06	0.00	-0.04	0.00	1.00				
Rated	-0.04	0.19	0.12	0.21	0.37	-0.05	0.26	0.67	0.30	0.16	0.30	0.04	0.00	-0.03	0.39	1.00			
Tangibility	0.00	0.09	0.09	0.00	0.01	-0.05	0.07	0.24	0.08	0.12	0.17	-0.01	-0.01	-0.02	0.29	0.23	1.00		
Cash	0.14	-0.09	-0.07	-0.03	-0.06	0.22	-0.17	-0.40	-0.27	-0.31	-0.29	0.03	0.03	0.17	-0.33	-0.34	-0.43	1.00	
Capex	0.05	0.04	0.05	-0.04	-0.04	-0.01	-0.01	0.10	-0.05	0.06	0.02	0.00	-0.04	0.03	0.12	0.07	0.66	-0.22	1.00

Table 4. SEO propensity

This table presents results of regression analysis of the probability that a firm does at least one SEO in a given year. The sample consists of 37,844 firm-year observations by merging CRSP, Compustat, and BoardEx databases over the period 2001-2015. The dependent variable is an indicator variable, *SEO*, that takes the value of one if a firm does at least one SEO in a given year, and zero otherwise. Panel A presents the estimation results for the full sample. Panel B presents results for the subsample that excludes firm-year observations where the IB director's tenure on a board is less than three years. Column (1) presents the standard probit regression results. Column (2) presents the recursive bivariate probit regression results. Columns (3) and (4) report the two-stage least squares (2SLS) regression results without and with firm fixed effects, respectively. Detailed definitions of all variables are provided in the Appendix. All regressions include year fixed effects and industry (two-digit SIC) fixed effects. Robust standard errors, adjusted for firm-level clustering, are in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Full sample

	SEO			
	Probit	Biprobit	2SLS	
Variable	(1)	(2)	(3)	(4)
IB director	0.008***	0.028***	0.050***	0.077**
	(0.003)	(0.011)	(0.013)	(0.037)
Board independence	0.010	0.003	-0.003	-0.008
	(0.013)	(0.014)	(0.013)	(0.023)
Interlocked peer SEO	0.031***	0.032***	0.088***	0.015
	(0.005)	(0.005)	(0.015)	(0.015)
Connection to capital providers	-0.000	-0.003	-0.004	-0.006
	(0.003)	(0.003)	(0.003)	(0.004)
Log (Total assets)	-0.005***	-0.006***	-0.006***	-0.045***
	(0.001)	(0.001)	(0.001)	(0.004)
Log (1+Firm age)	-0.017***	-0.017***	-0.016***	-0.029***
	(0.001)	(0.001)	(0.002)	(0.007)
ROA	-0.022***	-0.026***	-0.061***	-0.002
	(0.003)	(0.003)	(0.008)	(0.008)
Dividend payer	-0.024***	-0.024***	-0.014***	0.009**
	(0.003)	(0.003)	(0.003)	(0.004)
Tobin's Q	0.002***	0.002***	0.005***	0.008
	(0.001)	(0.001)	(0.001)	(0.004)
Prior year return	0.015***	0.017***	0.022***	0.017***
	(0.002)	(0.002)	(0.003)	(0.003)
Prior year SEO	0.074***	0.073***	0.114***	-0.071***
	(0.007)	(0.007)	(0.009)	(0.010)
Leverage	0.032***	0.030***	0.030***	0.075***
	(0.007)	(0.006)	(0.009)	(0.015)
Rated	0.013***	0.013***	0.009**	0.009
	(0.004)	(0.004)	(0.004)	(0.009)
Tangibility	0.001	-0.001	-0.008	-0.047
	(0.010)	(0.010)	(0.011)	(0.031)
Cash	0.024***	0.023***	0.035***	-0.119***
	(0.006)	(0.007)	(0.009)	(0.017)

Capex	0.132***	0.147***	0.207***	0.142***
	(0.025)	(0.024)	(0.039)	(0.049)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	No
Firm FE	No	No	No	Yes
Observations	37,615	37,844	37,844	37,844
R^2 (Pseudo R^2 for probit and within R^2 for fixed-effect 2SLS)	0.167	-	0.088	0.024
First stage:				
Instrument: Connection to IB directors		1.391***	0.493***	0.241***
		(0.089)	(0.031)	(0.032)
λ^2-statistics	-	4.031	-	-
Prob > λ^2	-	0.045	-	-
F-statistics	-	-	162.756	352.270
Prob > F	-	-	0.000	0.000

Panel B: Removing firm-years with recently hired IB directors

	SEO			
	Probit	Biprobit	2SLS	
Variable	(1)	(2)	(3)	(4)
IB director	0.007**	0.025*	0.048***	0.094*
	(0.003)	(0.014)	(0.016)	(0.057)
Board independence	0.018	0.012	0.004	-0.018
	(0.013)	(0.014)	(0.014)	(0.024)
Peer interlock SEO	0.028***	0.028***	0.076***	0.013
	(0.006)	(0.006)	(0.016)	(0.010)
Connection to capital providers	-0.001	-0.002	-0.004	-0.009
	(0.003)	(0.004)	(0.003)	(0.005)
Log (Total assets)	-0.005***	-0.006***	-0.006***	-0.048***
	(0.001)	(0.001)	(0.001)	(0.003)
Log (1+Firm age)	-0.017***	-0.018***	-0.019***	-0.028***
	(0.002)	(0.002)	(0.002)	(0.006)
ROA	-0.021***	-0.021***	-0.059***	-0.004
	(0.003)	(0.003)	(0.008)	(0.006)
Dividend payer	-0.023***	-0.024***	-0.013***	0.009*
	(0.003)	(0.003)	(0.003)	(0.005)
Tobin's Q	0.002***	0.002***	0.005***	0.007**
	(0.000)	(0.001)	(0.001)	(0.001)
Prior year return	0.014***	0.014***	0.019***	0.016***
	(0.002)	(0.002)	(0.003)	(0.002)
Prior year SEO	0.074***	0.073***	0.115***	-0.075***
	(0.007)	(0.007)	(0.010)	(0.010)
Leverage	0.028***	0.027***	0.031***	0.079***
	(0.006)	(0.006)	(0.010)	(0.010)
Rated	0.015***	0.015***	0.010***	0.009
	(0.005)	(0.005)	(0.004)	(0.008)
Tangibility	-0.003	-0.004	-0.015	-0.052**
	(0.010)	(0.010)	(0.011)	(0.023)
Cash	0.017***	0.016***	0.032***	-0.121***
	(0.007)	(0.007)	(0.009)	(0.014)
Capex	0.150***	0.152***	0.233***	0.161***
	(0.026)	(0.027)	(0.042)	(0.039)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	No
Firm FE	No	No	No	Yes
Observations	32,073	32,313	32,313	32,313
R^2 (Pseudo R^2 for probit and within R^2 for fixed-effect 2SLS)	0.165	-	0.087	0.026
First stage:				
Instrument: Connection to IB directors		1.460***	0.466***	0.154***
		(0.099)	(0.031)	(0.013)

λ^2-statistics	-	2.187	-	-
Prob > λ^2	-	0.139	-	-
F-statistics	-	-	121.913	141.560
Prob > F	-	-	0.000	0.000

Table 5. SEO announcement returns

This table presents results of regression analysis of two-day cumulative abnormal returns (CARs) around the SEO filing date. Panel A presents the sample formation process. Panel B presents regression results of CARs around the SEO filing date. Column (1) presents the OLS regression results. Column (2) presents results from a two-stage Heckman selection model, where the Inverse Mills ratio is added as an additional independent variable in the second-stage estimation of CARs. Detailed definitions of all variables are provided in the Appendix. All regressions include year fixed effects and industry (two-digit SIC) fixed effects. Robust standard errors, adjusted for firm-level clustering, are in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Sample formation

Total SEO announcements	2,508
- announcements with missing data to compute CAR	-228
- announcements with confounding earnings announcements during the event window	-205
- announcements with concurrent affiliation of IB directors	-25
- announcements with missing control variable information	-35
Final sample	2,015

Panel B: Multivariate regressions

	CAR	
	OLS	Heckman
Variable	(1)	(2)
IB director	0.007**	0.006*
	(0.003)	(0.003)
Board independence	-0.008	-0.008
	(0.017)	(0.017)
Interlocked peer SEO	-0.002	-0.002
	(0.005)	(0.005)
Connection to capital providers	-0.001	0.000
	(0.004)	(0.004)
Log (Total assets)	0.005**	0.005**
	(0.002)	(0.002)
ROA	-0.006	-0.005
	(0.007)	(0.007)
Tobin's Q	0.000	-0.000
	(0.000)	(0.001)
Prior year return	0.001	0.002
	(0.002)	(0.002)
Prior year SEO	-0.003	-0.004
	(0.004)	(0.004)
Leverage	0.019**	0.017*
	(0.009)	(0.009)
Rated	-0.003	-0.003
	(0.005)	(0.006)
Tangibility	-0.001	0.004
	(0.014)	(0.013)
Cash	0.014	0.018
	(0.010)	(0.011)
Capex	-0.049*	-0.048
	(0.027)	(0.030)
Return std	-0.169	-0.188
	(0.117)	(0.116)
Share turnover	-0.602***	-0.587***
	(0.179)	(0.178)
Relative size	-0.011	-0.005
	(0.013)	(0.013)
Secondary	-0.018*	-0.018*
	(0.009)	(0.010)
Underwriter ranking	0.0001	0.000
	(0.001)	(0.001)
Log (1+#Analysts)	-0.003	-0.003
	(0.002)	(0.003)
Inverse Mills Ratio		0.001
		(0.008)
Year FE	Yes	Yes
Industry FE	Yes	Yes
Observations	2,015	2,003
R^2	0.10	0.10

Table 6. SEO underpricing

This table presents results of regression analysis of SEO underpricing. Column (1) presents the OLS regression results. Column (2) presents results from a two-stage Heckman selection model, where the Inverse Mills ratio is added as an additional independent variable in the second-stage estimation of SEO underpricing. Column (3) presents the 2SLS results for the full sample. Column (4) presents the 2SLS results for the subsample that excludes firm-year observations where the IB director's tenure on a board is less than three years. Detailed definitions of all variables are provided in the Appendix. All regressions include year fixed effects and industry (two-digit SIC) fixed effects. Robust standard errors, adjusted for firm-level clustering, are in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Underpricing			
	OLS	Heckman	2SLS	Subsample 2SLS
Variable	(1)	(2)	(3)	(4)
IB director	-0.005**	-0.004**	-0.019*	-0.026*
	(0.002)	(0.002)	(0.010)	(0.014)
Board independence	0.009	0.009	0.017	0.012
	(0.011)	(0.011)	(0.013)	(0.015)
Interlocked peer SEO	-0.006*	-0.004	-0.006	-0.005
	(0.003)	(0.004)	(0.004)	(0.004)
Connection to capital providers	-0.000	-0.001	0.000	-0.001
	(0.003)	(0.003)	(0.003)	(0.003)
Log (Total assets)	-0.001	-0.001	-0.001	0.000
	(0.001)	(0.001)	(0.002)	(0.002)
ROA	-0.006	-0.008	-0.007	-0.010
	(0.005)	(0.005)	(0.005)	(0.006)
Tobin's Q	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.001)	(0.001)	(0.001)
Prior year return	-0.002*	-0.001	-0.002*	-0.002*
	(0.001)	(0.001)	(0.001)	(0.001)
Prior year SEO	-0.001	0.001	0.000	-0.001
	(0.002)	(0.003)	(0.002)	(0.003)
Leverage	0.005	0.008	0.008	0.011**
	(0.005)	(0.005)	(0.005)	(0.006)
Rated	0.000	0.001	-0.000	-0.002
	(0.003)	(0.003)	(0.003)	(0.004)
Tangibility	0.001	0.002	0.003	-0.002
	(0.006)	(0.007)	(0.007)	(0.007)
Cash	0.003	0.007	0.003	-0.002
	(0.006)	(0.007)	(0.006)	(0.007)
Capex	0.017	0.028*	0.016	0.029
	(0.016)	(0.017)	(0.016)	(0.019)

Return std	0.331***	0.338***	0.322***	0.293***
	(0.089)	(0.090)	(0.089)	(0.095)
Relative size	0.017	0.016	0.013	0.003
	(0.014)	(0.014)	(0.014)	(0.018)
PreCAR	0.040***	0.039***	0.038***	0.045***
	(0.014)	(0.014)	(0.014)	(0.017)
Log (Stock price)	-0.012***	-0.011***	-0.012***	-0.011***
	(0.002)	(0.002)	(0.002)	(0.002)
IPO underpricing	0.0001	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Underwriter ranking	-0.001	-0.001	-0.001	-0.001*
	(0.000)	(0.000)	(0.000)	(0.001)
Log (1+#Analysts)	-0.003*	-0.003**	-0.003*	-0.001
	(0.001)	(0.001)	(0.002)	(0.002)
Inverse Mills ratio		0.007*		
		(0.004)		
Year FE	Yes	Yes	Yes	Yes
Observations	2,196	2,196	2,196	1,806
R^2	0.20	0.20	0.17	0.16
First stage:				
Instrument: Connection to IB directors			0.545***	0.504***
			(0.065)	(0.091)
F-statistics			21.446	16.514
Prob > F			0.000	0.000

Table 7. SEO gross spread

This table presents results of regression analysis of gross spreads paid to investment banks. Column (1) presents the OLS regression results. Column (2) presents results from a two-stage Heckman selection model, where the Inverse Mills ratio is added as an additional independent variable in the second-stage estimation of gross spreads. Column (3) presents the 2SLS estimation results for the full sample. Column (4) presents the 2SLS results for the subsample that excludes firm-year observations where the IB director's tenure on a board is less than three years respectively. Detailed definitions of all variables are provided in the Appendix. All regressions include year fixed effects and industry (two-digit SIC) fixed effects. Robust standard errors, adjusted for firm-level clustering, are in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Log (Gross spread)			
	OLS	Heckman	2SLS	Subsample 2SLS
Variable	(1)	(2)	(3)	(4)
IB director	-0.050**	-0.046**	-0.261***	-0.307**
	(0.023)	(0.024)	(0.096)	(0.131)
Board independence	0.122	0.111	0.224*	0.159
	(0.116)	(0.117)	(0.129)	(0.127)
Interlocked peer SEO	0.011	0.017	0.017	0.010
	(0.040)	(0.041)	(0.041)	(0.052)
Connection to capital providers	0.011	0.015	0.029	0.014
	(0.040)	(0.031)	(0.031)	(0.035)
Log (Total assets)	-0.119***	-0.122***	-0.108***	-0.118***
	(0.022)	(0.023)	(0.024)	(0.025)
ROA	0.102***	0.099***	0.106***	0.092***
	(0.031)	(0.035)	(0.035)	(0.036)
Tobin's Q	-0.013	-0.013*	-0.013*	-0.016*
	(0.007)	(0.007)	(0.007)	(0.008)
Prior year return	0.010	0.011	0.017*	0.012
	(0.008)	(0.008)	(0.010)	(0.010)
Prior year SEO	0.026	0.034	0.031	0.019
	(0.023)	(0.024)	(0.024)	(0.026)
Leverage	0.025	0.033	0.049	0.063
	(0.048)	(0.050)	(0.051)	(0.052)
Rated	-0.077*	-0.078*	-0.086**	-0.077**
	(0.041)	(0.042)	(0.043)	(0.047)
Tangibility	0.019	0.021	0.018	-0.034
	(0.080)	(0.081)	(0.084)	(0.102)
Cash	-0.080	-0.074	-0.096	-0.116**
	(0.061)	(0.062)	(0.063)	(0.063)
Capex	-0.065	-0.035	-0.104	-0.054
	(0.154)	(0.163)	(0.164)	(0.193)
Return std	-0.216	-0.226	-0.015	-0.624*
	(0.679)	(0.697)	(0.694)	(0.726)
Share turnover	-1.489	-1.448	-1.935	-1.337
	(1.208)	(1.213)	(1.292)	(1.309)
Relative size	0.370***	0.380***	0.351***	0.257***
	(0.106)	(0.106)	(0.106)	(0.095)
Log (Stock price)	-0.044***	-0.042***	-0.050***	-0.058***
	(0.015)	(0.015)	(0.017)	(0.020)
Underwriter ranking	0.008*	0.009**	0.007	0.006
	(0.004)	(0.004)	(0.004)	(0.005)

Log (1+#Analysts)	-0.034**	-0.035**	-0.038**	-0.022
	(0.015)	(0.015)	(0.016)	(0.018)
Log (1+#Bookrunners)	0.337***	0.337***	0.371***	0.385***
	(0.054)	(0.055)	(0.061)	(0.069)
Inverse Mills ratio		0.024		
		(0.044)		
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Observations	2,097	2,097	2,097	1,685
R^2	0.29	0.29	0.25	0.26
First stage:				
Instrument: Connections to IB directors			0.606***	0.508***
			(0.052)	(0.057)
F-statistics			31.071	18.493
Prob > F			0.000	0.000

Table 8: Mechanisms

This table explores the mechanism underlying the effect of IB directors in SEOs. The second-stage results of 2SLS regressions are reported. In column (1), the dependent variable is a firm's stock return volatility. In column (2), the dependent variable is accrual quality, constructed following Lee and Masulis (2009), which is based on the standard deviation of residuals from regressing current accruals on operating cash flows in the prior, current, and subsequent years. Larger standard deviation implies poorer quality accounting information. In column (3), the dependent variable is analyst forecast errors. Detailed definitions of all variables are provided in the Appendix. All regressions include year fixed effects and industry (two-digit SIC) fixed effects. Robust standard errors, adjusted for firm-level clustering, are in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Second-Stage of 2SLS		
	Stock return volatility	Accrual quality	Analyst forecast error
Variable	(1)	(2)	(3)
IB director	-0.009**	-0.017***	-0.078**
	(0.005)	(0.007)	(0.031)
Board independence	0.007	-0.005	0.020
	(0.006)	(0.009)	(0.038)
Log (Total assets)	-0.010***	0.002*	-0.012***
	(0.001)	(0.001)	(0.004)
Log (1+Firm age)	-0.006***	-0.004***	-0.005
	(0.001)	(0.001)	(0.005)
ROA	-0.068***	-0.054***	-0.071***
	(0.004)	(0.007)	(0.017)
Dividend payer	-0.024***	0.001	-0.049***
	(0.001)	(0.001)	(0.008)
Tobin's Q	-0.003***	0.005***	-0.013***
	(0.000)	(0.001)	(0.003)
Prior year return	0.001	0.001	-0.031***
	(0.001)	(0.001)	(0.005)
Leverage	0.038***	0.008	0.096***
	(0.003)	(0.006)	(0.020)
Rated	0.003*	-0.003	0.016
	(0.002)	(0.002)	(0.014)
Tangibility	0.000	-0.001	0.066**
	(0.004)	(0.005)	(0.030)
Cash	0.008**	-0.017***	0.048**
	(0.003)	(0.005)	(0.021)
Capex	0.025**	0.054***	-0.035
	(0.012)	(0.017)	(0.086)
Cash flow volatility	0.002***	0.015***	-0.000
	(0.001)	(0.002)	(0.003)
Log (1+#Analysts)	-0.001	-0.007***	-0.064***
	(0.001)	(0.001)	(0.007)
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Observations	30,420	27,235	19,908
R^2	0.38	0.18	0.07
First stage:			
Instrument: Connection to IB directors	0.510***	0.521***	0.491***
	(0.013)	(0.015)	(0.017)
F-statistics	145.149	135.454	106.868
Prob > F	0.000	0.000	0.000

Table 9. Use of SEO proceeds and long-run operating performance

This table presents median changes in SEO firms' cash holdings, investment, and operating performance for two subsamples partitioned by the presence of IB directors. Panel A presents median changes in raw measures for SEO firms with IB directors and matching SEO firms without IB directors. Matching firms are chosen using the following algorithm: 1) If there is at least one SEO firm without IB directors in the same four-digit SIC industry in the same year, the one with the closest operating performance measured in year -1 is used (year 0 is the SEO year); ii) if no matching firm is found, we then search for a match at a broader SIC level. Panel B presents median changes in benchmark-adjusted measures for SEO firms with and without IB directors, respectively. To obtain benchmark firms, we pair each SEO firm with a set of matching non-SEO firms by selecting firms with the same SIC code (starting with four-digit SIC) and operating performance within 90% to 110% of the SEO firms' performance in year -1. Benchmark-adjusted measure is then calculated as the difference between the measure of SEO firm and the median measure of matching firms. Changes in both the raw measures and the benchmark-adjusted measures are reported for three different event windows ranging from the one year prior to the SEO to one year, two years, and three years after the offer, respectively. Numbers in parentheses indicate the number of observations in each matching sample. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels based on the Wilcoxon tests.

Panel A: Raw measures for SEO firms with IB directors and matching SEO firms without IB directors

Variables	Event windows	SEOs with IB directors	SEOs without IB directors	Difference
Cash	(-1,+1)	0.002	0.002	
		(630)	(630)	
	(-1,+2)	0.000	0.002	
		(518)	(518)	
	(-1,+3)	-0.005	0.001	**
		(407)	(407)	
Investment	(-1,+1)	-0.003	-0.016	***
		(630)	(630)	
	(-1,+2)	-0.003	-0.012	**
		(518)	(518)	
	(-1,+3)	-0.004	-0.017	***
		(405)	(405)	
Operating performance	(-1,+1)	0.009	0.005	**
		(633)	(633)	
	(-1,+2)	0.011	0.006	*
		(518)	(518)	
	(-1,+3)	0.017	0.000	**
		(407)	(407)	

Panel B: Benchmark-adjusted measures for SEO firms with IB directors and SEO firms without IB directors

Variables	Event windows	SEOs with IB directors	SEOs without IB directors	Difference
Cash	(-1,+1)	-0.005	0.001	
		(612)	(886)	
	(-1,+2)	0.001	0.005	**
		(509)	(720)	
	(-1,+3)	0.000	0.004	
		(424)	(596)	
Investment	(-1,+1)	-0.002	-0.004	
		(607)	(880)	
	(-1,+2)	0.001	-0.011	***
		(507)	(729)	
	(-1,+3)	-0.001	-0.011	**
		414	590	
Operating performance	(-1,+1)	0.011	0.001	***
		(621)	(887)	
	(-1,+2)	0.011	0.005	*
		(517)	(715)	
	(-1,+3)	0.020	0.003	**
		(422)	(581)	

Table 10. Long-run stock performance

This table presents the median buy-and-hold abnormal returns (BHARs) across subsamples partitioned by the presence of IB directors. A buy-and-hold return is calculated for the SEO firm for up to three years after the offer. Panel A presents market-adjusted BHARs where the return on the CRSP value-weighted index is the market return. Panel B presents Fama-French adjusted BHARs, calculated by first regressing the five-year monthly returns leading up to SEOs on the monthly Fama-French three factors and then using the estimated coefficients to calculate the firm's monthly abnormal returns before compounding. Panel C presents benchmark-adjusted BHARs. Each SEO firm is matched to a control firm that has market values of equity between 70% and 130% of that of the SEO sample firm and whose book-to-market ratio is closest to that of the sample firm. Benchmark-adjusted BHARs is then calculated as the difference between the BHARs of a SEO firm and the median BHARs of matching firms. Numbers in parentheses indicate the number of observations in each matching sample. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels based on the Wilcoxon tests.

Panel A: Market-adjusted buy-and-hold returns

Event windows	SEOs with IB directors	SEOs without IB directors	Difference
(0, +1)	-0.079	-0.178	***
	(872)	(1349)	
(0, +2)	-0.106	-0.243	***
	(762)	(1160)	
(0, +3)	-0.211	-0.331	***
	(644)	(972)	

Panel B: Fama-French adjusted buy-and-hold returns

Event windows	SEOs with IB directors	SEOs without IB directors	
(0, +1)	-0.133	-0.221	***
	(609)	(910)	
(0, +2)	-0.239	-0.327	**
	(539)	(792)	
(0, +3)	-0.187	-0.347	**
	(458)	(670)	

Panel C: Benchmark-adjusted buy-and-hold returns

Event windows	SEOs with IB directors	SEOs without IB directors	Difference
(0, +1)	-0.014	-0.078	**
	(865)	(1,333)	
(0, +2)	-0.035	-0.103	*
	(755)	(1,145)	
(0, +3)	-0.097	-0.105	
	(639)	(960)	

Internet Appendix for "Investment Banker Directors and Seasoned Equity Offerings"

Table IA1. First-stage instrumental variable (IV) regressions

This table presents results of the first-stage IV regressions. Column (1) presents the results for the first-stage bivariate probit regression (column (2) in Panel A of Table 4). Column (2) presents the first-stage results of 2SLS regressions (column (3) in Panel A of Table 4). Detailed definitions of all variables are provided in the Appendix. All regressions include year fixed effects and industry (two-digit SIC) fixed effects. Robust standard errors, adjusted for firm-level clustering, are in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Biprobit first stage	2SLS first stage
Variable	(1)	(2)
Connection to IB directors	1.391***	0.493***
	(0.089)	(0.031)
Log (Board size)	0.556***	0.182***
	(0.078)	(0.025)
Board independence	0.435**	0.133**
	(0.176)	(0.057)
Interlocked peer SEO	-0.246***	-0.086***
	(0.068)	(0.023)
Connection to capital providers	0.049	0.019
	(0.038)	(0.013)
Log (Total assets)	-0.002	-0.001
	(0.016)	(0.005)
Log (1+Firm age)	-0.079***	-0.027***
	(0.020)	(0.007)
ROA	0.032	0.012
	(0.044)	(0.014)
Dividend payer	-0.030	-0.009
	(0.042)	(0.014)
Tobin's Q	-0.001	0.000
	(0.008)	(0.002)
Prior year return	0.012	0.003
	(0.012)	(0.004)
Prior year SEO	0.109***	0.036***
	(0.036)	(0.013)
Leverage	0.324***	0.111***
	(0.076)	(0.027)
Rated	0.040	0.019
	(0.053)	(0.019)
Tangibility	0.286***	0.097**
	(0.124)	(0.043)
Cash	-0.045	-0.019
	(0.092)	(0.030)
Capex	-0.415	-0.150
	(0.292)	(0.100)
Year FE	Yes	Yes
Industry FE	Yes	Yes
Observations	37,844	37,844
R^2 (Pseudo R^2 for probit)	0.1151	0.1455

Table IA2. SEO propensity: robustness checks

This table presents results of regression analysis of the number of SEOs and the size of SEO deals in a given year. The sample consists of 37,844 firm-year observations by merging CRSP, Compustat, and BoardEx databases over the period 2001-2015. In Panel A, the dependent variable is the natural logarithm of one plus the number of SEOs during the year. In Panel B, the dependent variable is the natural logarithm of one plus total SEO proceeds scaled by issuers' market capitalization. Column (1) presents the OLS regression results. Columns (2) and (3) report the 2SLS results for the full sample and for the subsample that excludes firm-year observations where the IB director's tenure on board is less than three years, respectively. Column (4) presents the 2SLS results with firm fixed effects. Detailed definitions of all variables are provided in the Appendix. All regressions include the same set of control variables as in Table 4. Robust standard errors, adjusted for firm-level clustering, are in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: The number of SEOs

	Log (1 + #SEOs)			
	OLS	2SLS		
Variable	(1)	(2)	(3)	(4)
IB director	0.006***	0.035***	0.035***	0.058**
	(0.002)	(0.010)	(0.012)	(0.028)
Board independence	0.011	-0.002	0.001	-0.006
	(0.010)	(0.011)	(0.011)	(0.017)
Firm characteristics	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	No
Firm FE	No	No	No	Yes
Observations	37,844	37,844	32,313	37,844
R^2	0.1011	0.0953	0.0939	0.0267

Panel B: The volume of SEOs

	Log (1 + Proceeds / Mktcap)			
	OLS	2SLS		
Variable	(1)	(2)	(3)	(4)
IB director	0.002***	0.010***	0.010***	0.021***
	(0.001)	(0.003)	(0.003)	(0.007)
Board independence	0.004	0.000	0.000	-0.001
	(0.003)	(0.003)	(0.003)	(0.005)
Firm characteristics	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	No
Firm FE	No	No	No	Yes
Observations	37,844	37,844	32,313	37,844
R^2	0.0796	0.0735	0.0694	0.0251

Table IA3. IB directors and SEO issue size

This table presents results of regression analysis of the size of SEO deals. In columns (1) - (3), the dependent variable is the natural logarithm of net proceeds, the natural logarithm of one plus net proceeds scaled by issuer's market capitalization, and the natural logarithm of one plus net proceeds scaled by issuer's total assets, respectively. Detailed definitions of all variables are provided in the Appendix. All regressions include the same set of control variables as in Table 4. Robust standard errors, adjusted for firm-level clustering, are in parentheses. Detailed definitions of all variables are provided in the Appendix. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Log (Proceeds)	Log (1 + Proceeds / Mktcap)	Log (1+Proceeds / Total assets)
Variable	(1)	(2)	(3)
IB director	-0.033	-0.008	-0.009
	(0.032)	(0.009)	(0.007)
Firm characteristics	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Observations	2,220	2,220	2,220
R^2	0.7581	0.6229	0.2713

Table IA4. IB directors and market timing

This table presents results of regression analysis examining the effect of IB directors on SEO market timing. In columns (1) - (3), the dependent variable is the SEO, the natural logarithm of one plus the number of SEOs, and the natural logarithm of one plus total net proceeds scaled by firm's market capitalization. Column (1) presents the probit regression results. Columns (2) and (3) report the OLS results. Detailed definitions of all variables are provided in the Appendix. All regressions include the same set of control variables as in Table 4. Robust standard errors, adjusted for firm-level clustering, are in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Variable	SEO (1)	Log (1 + #SEOs) (2)	Log (1 + Proceeds / Mktcap) (3)
IB director	0.081***	0.006***	0.002***
	(0.028)	(0.002)	(0.000)
IB director * Prior year return	0.011	0.002	-0.000
	(0.030)	(0.004)	(0.001)
Firm characteristics	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Observations	37,615	37,844	37,844
R^2 (Pseudo R^2 for probit)	0.1672	0.1011	0.0796

Table IA5. IB directors and the propensity of issuing corporate bonds

This table presents results of regression analysis of the probability that a firm does at least one public bond offering in a given year. The dependent variable is an indicator variable, *Bond issuance*, that takes the value of one if a firm does at least one bond offering in a given year, and zero otherwise. Column (1) presents the standard probit regression results. Column (2) presents the recursive bivariate probit regression results. Column (3) presents 2SLS results. Detailed definitions of all variables are described in the Appendix. All regressions control for calendar year-fixed effects and industry (2-digit SIC) fixed effects whose coefficients are suppressed for brevity. Robust standard errors, adjusted for firm-level clustering, are in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Bond issuance		
	Probit	Biprobit	2SLS
Variable	(1)	(2)	(3)
IB director	0.003	0.022*	0.050***
	(0.003)	(0.013)	(0.017)
Board independence	0.043**	0.033	-0.008
	(0.019)	(0.020)	(0.018)
Interlocked peer bond issuance	-0.006	-0.006	-0.010
	(0.005)	(0.005)	(0.007)
Connection to capital providers	-0.001	-0.003	0.004
	(0.003)	(0.004)	(0.005)
Log (Total assets)	0.041***	0.040***	0.031***
	(0.001)	(0.002)	(0.002)
Log (1+Firm age)	0.001	0.002	0.009***
	(0.002)	(0.002)	(0.002)
ROA	-0.025***	-0.025***	-0.031***
	(0.006)	(0.006)	(0.004)
Dividend payer	-0.029***	-0.029***	-0.023***
	(0.004)	(0.004)	(0.005)
Tobin's Q	0.003***	0.003**	0.002**
	(0.001)	(0.001)	(0.001)
Prior year return	0.015***	0.015***	0.010***
	(0.003)	(0.003)	(0.002)
Prior year bond issuance	0.103***	0.103***	0.210***
	(0.006)	(0.006)	(0.010)
Leverage	0.076***	0.074***	0.034***
	(0.009)	(0.009)	(0.011)
Rated	0.060***	0.059***	0.102***
	(0.005)	(0.005)	(0.007)
Tangibility	0.001	-0.001	0.008
	(0.014)	(0.013)	(0.016)
Cash	0.006	0.005	0.007
	(0.011)	(0.011)	(0.008)
Capex	0.185***	0.189***	0.149***
	(0.038)	(0.038)	(0.044)

Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Observations	37,598	37,844	37,844
R^2 (Pseudo R^2 for probit)	0.284	-	0.222
First stage:			
Instrument: Connection to IB directors		1.383***	0.490***
		(0.089)	(0.031)
λ^2-statistics	-	2.561	-
Prob > λ^2	-	0.094	-
F-statistics	-	-	160.581
Prob > F	-	-	0.000

Table IA6. IB directors and the cost of corporate bonds

This table presents results of regression analysis of the cost of corporate bonds. Panel A presents univariate results for the relation between the presence of IB directors and a firm's cost of corporate bonds. Panel B presents results of multivariate regression analysis. The dependent variable is the natural logarithm of the bond spread, defined as the difference between the offering yield of a corporate bond at issue minus the yield of the maturity-matched Treasury bond. Column (1) presents the OLS regression results. Column (2) presents the 2SLS second-stage results. Bond seniority includes indicator variables flagging whether the bond is secured or subordinated. Bond features includes indicator variables flagging whether the bond is puttable, convertible, redeemable or exchangeable. Macroeconomic controls include default spread, which is the yield spread between BAA and AAA corporate bond indices, and term spread, which is the yield spread between ten-year Treasury bonds and three-month Treasury bills. Detailed definitions of all variables are provided in the Appendix. All regressions include year fixed effects and industry (two-digit SIC) fixed effects. Robust standard errors, adjusted for firm-level clustering, are in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Univariate analysis

	With IB directors			Without IB directors		
	# obs	Mean	Median	# obs	Mean	Median
Bond spread	3,396	188.87	148.60	2,540	178.72	143.48**
Log (Bond spread)	3,035	5.13	5.13	2,086	5.21***	5.24***

Panel B: Multivariate analysis

	Log (Bond spread)	
	OLS	2SLS
Variable	(1)	(2)
IB director	0.004	0.116
	(0.019)	(0.109)
Board independence	-0.103	-0.144
	(0.126)	(0.133)
Connection to capital providers	-0.001	-0.013
	(0.018)	(0.022)
Log (Total assets)	-0.098***	-0.105***
	(0.014)	(0.016)
ROA	-0.326**	-0.364**
	(0.138)	(0.144)
Tobin's Q	-0.091***	-0.095***
	(0.020)	(0.021)
Prior year return	-0.088***	-0.086***
	(0.022)	(0.022)
Leverage	0.144*	0.131*
	(0.078)	(0.079)
Tangibility	-0.022	-0.036
	(0.084)	(0.085)
Cash	0.159	0.124
	(0.116)	(0.120)
Capex	0.017	0.049
	(0.201)	(0.202)
Return std	9.009***	9.190***
	(1.239)	(1.255)

Log (1+#Analysts)	-0.036**	-0.032*
	(0.018)	(0.019)
Z-Score	-0.012	-0.011
	(0.009)	(0.009)
Log (Bond size)	0.086***	0.085***
	(0.018)	(0.018)
Log (Bond maturity)	0.182***	0.183***
	(0.018)	(0.018)
Bond ratings	Yes	Yes
Bond seniority	Yes	Yes
Bond features	Yes	Yes
Macro controls	Yes	Yes
Year FE	Yes	Yes
Industry FE	Yes	Yes
Observations	4,760	4,760
R^2	0.7322	0.7289
F-statistics		19.655
Prob > F		0.000

Table IA7. IB directors and the propensity of obtaining bank loans

This table presents results of regression analysis of the probability that a firm obtains at least one bank loan in a given year. The dependent variable is an indicator variable, *Obtaining loan*, that takes the value of one if a firm obtains at least one bank loan in a given year, and zero otherwise. Column (1) presents the standard probit regression results. Column (2) presents the recursive bivariate probit regression results. Column (3) presents 2SLS results. Detailed definitions of all variables are described in the Appendix. All regressions control for calendar year-fixed effects and industry (2-digit SIC) fixed effects whose coefficients are suppressed for brevity. Robust standard errors, adjusted for firm-level clustering, are in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Obtaining loan		
	Probit	Biprobit	2SLS
Variable	(1)	(2)	(3)
IB director	-0.006	0.006	0.033
	(0.006)	(0.028)	(0.030)
Board independence	0.144***	0.144***	0.127***
	(0.032)	(0.034)	(0.033)
Interlocked peer loan	-0.002	-0.002	-0.005
	(0.009)	(0.009)	(0.010)
Connection to capital providers	0.016**	0.015**	0.019**
	(0.007)	(0.007)	(0.008)
Log (Total assets)	0.054***	0.053***	0.048***
	(0.003)	(0.003)	(0.003)
Log (1+Firm age)	-0.017***	-0.017***	-0.012***
	(0.004)	(0.004)	(0.004)
ROA	0.018	0.019	-0.028
	(0.023)	(0.023)	(0.017)
Dividend payer	0.020***	0.020***	0.026***
	(0.007)	(0.007)	(0.008)
Tobin's Q	0.003	0.003	0.000
	(0.004)	(0.004)	(0.003)
Prior year return	0.019***	0.019***	0.017***
	(0.005)	(0.005)	(0.005)
Prior year loan	0.013**	0.013**	0.022**
	(0.007)	(0.007)	(0.007)
Leverage	0.044**	0.042**	0.027**
	(0.019)	(0.019)	(0.019)
Rated	0.024***	0.023***	0.046***
	(0.009)	(0.009)	(0.009)
Tangibility	-0.044*	-0.044*	-0.041*
	(0.023)	(0.023)	(0.025)
Cash	-0.399***	-0.398***	-0.314***
	(0.025)	(0.025)	(0.020)
Capex	0.325***	0.328***	0.302***
	(0.067)	(0.068)	(0.072)

Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Observations	23,342	23,344	23,344
R^2 (Pseudo R^2 for probit)	0.1323	-	0.088
First stage:			
Instrument: Connection to IB directors		1.409***	0.500***
		(0.110)	(0.038)
λ^2-statistics	-	0.1997	-
Prob > λ^2	-	0.655	-
F-statistics	-	-	114.680
Prob > F	-	-	0.000

Table IA8. IB directors and the cost of bank loans

This table presents results of regression analysis of the cost of bank loans. Panel A presents univariate results for the relation between the presence of IB directors and a firm's cost of bank loans. Panel B presents the results of multivariate regression analysis. The dependent variable is the natural logarithm of the all-in spread. Column (1) presents the OLS regression results. Column (2) presents the 2SLS second-stage results. Loan seniority is an indicator variable flagging whether the loan is secured. Loan type variables are indicators flagging whether the loan is a term loan, revolver greater than one year, revolver less than one year, or 364-day facility. Macroeconomic controls include default spread, which is the yield spread between BAA and AAA corporate bond indices, and term spread, which is the yield spread between ten-year Treasury bonds and three-month Treasury bills. Detailed definitions of all variables are provided in the Appendix. All regressions include year fixed effects and industry (two-digit SIC) fixed effects. Robust standard errors, adjusted for firm-level clustering, are in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Univariate analysis

	With IB directors			Without IB directors		
	# obs	Mean	Median	# obs	Mean	Median
All-in spread	4,819	184.77	162.50	5,443	196.13***	175.00***
Log (All-in spread)	4,819	4.90	5.09	5,443	5.01***	5.17***

Panel B: Multivariate analysis

	Log (All-in spread)	
	OLS	2SLS
Variable	(1)	(2)
IB director	-0.009	-0.081
	(0.013)	(0.067)
Board independence	0.028	0.063
	(0.072)	(0.078)
Connection to capital providers	-0.035***	-0.032**
	(0.013)	(0.013)
Log (Total assets)	-0.017	-0.012
	(0.010)	(0.011)
ROA	-0.634***	-0.620***
	(0.082)	(0.083)
Tobin's Q	-0.033***	-0.031**
	(0.012)	(0.012)
Prior year return	-0.007	-0.007
	(0.010)	(0.010)
Leverage	0.245***	0.260***
	(0.046)	(0.048)
Tangibility	-0.151***	-0.151***
	(0.048)	(0.049)
Cash	0.122*	0.124*
	(0.066)	(0.066)
Capex	0.387**	0.393**
	(0.152)	(0.152)
Return std	4.985***	5.047***
	(0.656)	(0.656)

Log (1+#Analysts)	-0.054***	-0.055***
	(0.011)	(0.011)
Z-Score	-0.019***	-0.019***
	(0.004)	(0.004)
Log (Loan size)	-0.065***	-0.065***
	(0.008)	(0.008)
Log (Loan maturity)	-0.029*	-0.026
	(0.016)	(0.016)
Log (1+# Syndicated lenders)	-0.033***	-0.034***
	(0.011)	(0.011)
Performance pricing dummy	-0.074***	-0.071***
	(0.013)	(0.013)
Credit rating	Yes	Yes
Loan seniority	Yes	Yes
Loan type	Yes	Yes
Macro controls	Yes	Yes
Year FE	Yes	Yes
Industry FE	Yes	Yes
Observations	10,260	10,260
R^2	0.7554	0.7538
F-statistics		65.346
Prob > F		0.000