

The “Dark” Side of CEO Network Centrality: Evidence from Seasoned Equity Offerings

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Abstract

This paper investigates the impact of Chief Executive Officer (CEO) network centrality on seasoned equity offerings (SEOs). We find a positive relationship between CEO network centrality and firms' propensity to conduct SEOs. This relationship is more pronounced for firms with weak corporate governance. Regarding the economic mechanism, equity-issuing firms with well-connected CEOs are associated with positive SEO announcement returns, followed by negative long-run post-SEO returns. These findings are consistent with the managerial opportunism hypothesis, demonstrating that these SEOs are driven by catering to market timing. Furthermore, equity-issuing firms exhibit overinvestment problems, increased crash risk, and inferior operating performance following SEOs. Taken together, our findings reveal the “dark” side of CEO network centrality, suggesting that high-centrality CEOs could leverage their informational and positional advantages to exacerbate opportunistic behavior, thereby pursuing value-destroying SEOs.

Keywords: CEO network centrality; Seasoned equity offering; Market timing; SEO performance.

JEL Code: G14; G32; G34; L14.

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1. Introduction

Seasoned equity offerings (SEOs) are a critical aspect of corporate finance, representing an important mechanism that enables firms to adjust their capital structure or secure long-term funding. Existing literature has investigated firms' equity issuance decisions from the perspective of growth prospects (Denis, 1994; Myers, 1997; Walker and Yost, 2008; Frank and Sanati, 2021), market valuations (Loughran and Ritter, 1995; Baker and Wurgler, 2000, 2002), corporate governance (Jung et al., 1996; Kim and Purnanandam, 2014), and institutional holdings (Khan et al., 2012; Evans et al., 2024). However, this body of work has largely overlooked the role of idiosyncratic CEO characteristics in equity issuance decisions. Given established evidence that executives can strategically take advantage of their private information in corporate decision-making (see Jung et al., 1996; Jenter, 2005; Kim and Purnanandam, 2014), we posit that CEOs with distinct attributes have incentives to conduct SEOs. Thus, we ask: who are these CEOs, and importantly, what are the consequences of these SEOs?

We address this question by exploring the critical role of CEO network centrality in a firm's financing decisions. It is well-established in social network literature that social connections facilitate the transmission of information and reduce informational frictions (Burt, 1997; Granovetter, 2005; Jackson, 2010; Light and Moody, 2020). CEOs occupying more central positions in professional networks are therefore better informed about industry developments, market conditions, and regulatory changes (Faleye et al., 2014; Fogel et al., 2018; He, 2022). Beyond informational advantages, these CEOs have greater managerial influence, as strong social ties between CEOs and directors often correlate with accumulated power to secure the adoption of some corporate decisions more easily (Renneboog and Zhao, 2011). Consequently, well-connected CEOs enjoy both informational and

positional advantages over their less-connected counterparts. We argue that such advantages could influence a firm's propensity to conduct SEOs through the following distinct channels.

On the one hand, the learning hypothesis posits that managers can incorporate information from the stock market and other market participants into their decision-making processes (Luo, 2005; Chen et al., 2007).¹ Well-connected CEOs with superior information access are more effective at acquiring and filtering information, and identifying valuable, yet unexploited growth opportunities (Fracassi, 2017; Miranda-Lopez et al., 2019).² To exploit such growth options, firms often exhibit a greater reliance on equity financing to mitigate debt overhang problems and preserve financial and managerial flexibility (Myers, 1977; Denis, 1994; Walker and Yost, 2008; Frank and Sanati, 2021). Moreover, CEO network centrality is associated with a lower cost of equity capital, as stronger CEO-director connections can improve internal information sharing, enhance transparency, and strengthen internal governance (Bhuyan and Javakhadze, 2024). These mechanisms reduce information asymmetry between firms and external investors, facilitating equity issuance on more favorable terms. Based on these two mechanisms, we label this perspective as the *managerial learning hypothesis*, wherein network advantages enable superior investment identification and secure equity funding at a lower cost.

On the other hand, the market timing theory, especially from the catering perspective, suggests that managers are more likely to issue equity and invest the proceeds to cater to investors who overvalue the firm's investment opportunities (Derrien et al., 2013). CEO network centrality may facilitate such opportunistic market timing by enhancing managers' ability to detect and exploit time-

¹ The most widely interpretation of this phenomenon is that stock prices aggregate information from many different participants, suggesting that the prices may contain some information that managers do not have (Dow and Gorton, 1997; Subrahmanyam, and Titman, 1999; Goldstein and Guembel, 2008).

² In this study, the term investment opportunity is interchangeable as growth opportunity or growth option.

varying mispricing in financial markets (Evgeniou et al., 2022). Such catering to market timing could lead to overinvestment following SEOs, which can not only mislead investor expectations about the firm's growth prospects but also prolong the mispricing window (Gilchrist et al., 2005; Polk and Sapienza, 2009; Alzahrani and Rao, 2014). In addition, studies show that equity issuance could be related to managers' agency motives (e.g., Jung et al., 1996; Fu, 2010; Kim and Purnanandam, 2014). Well-connected CEOs are found to be associated with diminished board oversight, which can result in more opportunistic behavior at the expense of shareholder interests (Renneboog and Zhao, 2011; Fracassi and Tate, 2012). Hence, this enhanced market timing ability, coupled with weakened governance constraints, provides a strong motive for well-connected CEOs to engage in opportunistic SEOs. Since these mechanisms are rooted in managerial opportunistic behavior, we refer to them jointly as the *managerial opportunism hypothesis*. In general, both hypotheses predict that well-connected CEOs exhibit greater SEO propensity, but the underlying mechanisms are different.

Under the *managerial learning hypothesis*, high-centrality CEOs could identify value-enhancing investment opportunities and reduce information asymmetry for market participants. If these CEOs issue equity to finance such investments in the best interests of shareholders, this would lead to positive market reactions at the SEO announcement and increase long-term shareholder value. Conversely, under the *managerial opportunism hypothesis*, issuing firms may also experience positive SEO announcement returns if CEOs successfully cater to investor sentiment. However, this opportunistic behavior will destroy shareholder value in the long run. Thus, the different predictions regarding post-issue performance enable us to empirically distinguish between these two hypotheses.

To investigate the above views, we study a comprehensive sample of 402,437 firm-monthly observations of 4,472 unique U.S. listed firms and 2,797 SEO events between 2006 and 2024. Our

baseline results show a positive relationship between CEO network centrality and SEO propensity. A one-standard-deviation increase in CEO network centrality is associated with a 9% increase in the likelihood of conducting an SEO. This relation is robust across several specifications and addresses potential endogeneity concerns. Furthermore, the positive relation is more pronounced among firms with weak corporate governance (e.g., large boards, low institutional ownership, and limited short-selling pressure). We interpret this as indirect support for the *managerial opportunism hypothesis*, where weak corporate governance may offer these CEOs more flexibility for opportunistic equity issuance.

To uncover the economic mechanisms underlying this relationship, we further investigate the impact of CEO network centrality on both SEO announcement returns and post-issuance performance. Our findings reveal a striking pattern that is consistent with the *managerial opportunism hypothesis*. Although firms led by well-connected CEOs experience positive market reactions at the time of SEO announcements (an average increase of 0.7% in cumulative abnormal returns (CARs)), these SEOs are followed by significant long-run underperformance. This value-destroying effect intensifies over time, with buy-and-hold abnormal returns (BHARs) reveal statistically significant underperformance of -4.7%, -4.1%, and -6.5% over the 12-month, 24-month, and 36-month post-issuance windows. These findings are aligned with the catering view of market timing, which argues that managers strategically issue equity to cater to investor sentiment in the short run, but such behavior ultimately destroys shareholder value in the long run (Derrien et al., 2013).

Finally, we conduct three additional tests to examine the underlying channels of the *managerial opportunism hypothesis*. First, we investigate the impact of CEO network centrality on the investment efficiency of issuing firms. Our analysis shows that well-connected CEOs tend to overinvest. This is

consistent with previous studies (Gilchrist et al., 2005; Alzahrani and Rao, 2014), suggesting that SEOs motivated by market timing or catering, or a combination of the two, often lead to overinvestment problems. Second, we test whether issuing firms with high-centrality CEOs experience subsequent stock price crashes following SEOs. Studies theorize that managers can strategically withhold bad news to keep investors' expectations at unjustifiable levels, allowing negative information to accumulate (e.g., Jin and Myers, 2006; Hutton et al., 2009). Because well-connected CEOs possess greater control over firm-specific information flows, such behavior may complement opportunistic market timing or catering. Consistent with this mechanism, we find that SEOs conducted by firms with highly central CEOs are followed by a higher likelihood of stock price crashes. Third, we observe that issuing firms with well-connected CEOs have inferior operating performance compared to their industry peers, as evidenced by a decrease in the issuing firm's operating performance following SEOs.

Taken together, our findings present a theoretically consistent and empirically robust narrative about the “dark” side of CEO network centrality in the context of equity issuance. We document that socially connected CEOs tend to strategically time equity offerings, overinvest the proceeds in value-destructive projects, and persistently withhold negative information, which results in stock price crashes. In contrast to the traditional view that emphasizes the benefits of CEO social capital, our findings demonstrate how network centrality can instead be a source of value destruction in corporate financing decisions.

This study contributes to the existing literature in several ways. First, our study contributes to the market timing and catering theory of equity issuance (Loughran and Ritter, 1995; Baker and Wurgler, 2000, 2002; Derrien et al., 2013). Building on the prior literature on the determinants of SEOs (Denis, 1994; Loughran and Ritter, 1995; Myers, 1997; Baker and Wurgler, 2000, 2002; Evans et al.,

2024), we identify CEO network centrality as a novel and key determinant of equity issuance. This study provides critical insights into the catering view of market timing by identifying the specific mechanisms through which managers obtain and operationalize the informational and positional advantages that the existing literature typically assumes to be exogenous in equity issuance.

Second, we provide new evidence for the SEO performance literature. Existing studies mainly attribute the positive SEO announcement effects to investment opportunities (Myers and Majluf, 1984; Jung et al., 1996; Walker and Yost, 2008) and SEO underperformance to the information asymmetry (e.g., Loughran and Ritter, 1995; Spiess and Affleck-Graves, 1995; Jeanneret, 2005). Complementing these findings, our study documents the CEO's network position as a critical, yet previously overlooked, factor that can explain both the short-term announcement effect and the long-term underperformance of SEOs. More broadly, our findings relate to the literature on investors' biased reactions to information, showing that network-derived managerial advantages allow CEOs to initially capitalize on investor optimism through strategic market timing, but at the cost of subsequent value destruction.

Third, we provide important insights into whether CEOs with strong network centrality create value for shareholders. Unlike prior studies focusing on corporate innovation (Faleye et al., 2014), cash holdings (Miranda-Lopez et al., 2019), or financial reporting (He, 2022), where the impact on shareholder value is often difficult to directly quantify, we provide direct evidence of the impact of CEO network centrality on shareholder wealth through one of the most important strategic decisions – SEOs. We find that the increased equity issuance propensity stems primarily from market-timing and catering incentives rather than value-creating motives, indicating that well-connected CEOs may not exploit their informational advantages and social influence to make informed decisions. Thus, this paper resolves an important ongoing debate by demonstrating that network centrality can facilitate

managers' opportunistic behavior. Our findings are economically significant and have important implications concerning CEO selection and management.

Fourth, our study contributes to the literature by investigating the channels through which CEO network centrality exacerbates catering and agency motives following SEOs. Specifically, we demonstrate that issuing firms with well-connected CEOs tend to overinvest (Gilchrist et al., 2005; Fu, 2010; Alzahrani and Rao, 2014) and engage in bad-news hoarding (Jin and Myers, 2006; Hutton et al., 2009). Our evidence indicates that these CEOs deploy SEO proceeds toward aggressive, empire-building investments while simultaneously leveraging their extensive networks to suppress negative information, substantially increasing the likelihood of post-issue stock price crashes. This evidence collectively underscores how CEOs exploit their network position to manipulate market perceptions and conceal adverse information, thereby significantly intensifying agency problems and directly undermining long-term shareholder value.

The rest of the paper is structured as follows: Section 2 describes the data and methodology, Section 3 presents the main empirical results, Section 4 presents further analyses, and Section 5 concludes.

2. Data and Methodology

2.1 Sample Selection

We focus on CEOs from public U.S. firms and obtain their network information from BoardEx. To assess the connections within their social networks, we consider educational connections and third-party past professional connections.³ Education connections are formed when two individuals have

³ Following He et al. (2022), we define two persons as socially connected if they are linked through at least one of the two connections.

graduated from the same educational institution. Third-party past professional connections are established when two people overlap through a common past job or past board membership. For instance, if a CEO worked at a company during the same years as another individual, we mark the start year of this overlapping period as the beginning of their connection. Following El-Khatib et al. (2015) and Fogel et al. (2018), this study assumes that once social connections are established, they persist indefinitely unless one of the parties in the connection dies. This methodological approach reflects the cumulative nature of professional networks, ensuring the network dataset grows monotonically over time.

Our initial SEO sample comprises non-IPO equity issuance obtained from the Securities Data Corporation (SDC) database, covering the period from January 2006 to December 2024. We use the following criteria to filter our final SEO sample: 1) the issue type is classified as a follow-on offering;⁴ 2) firms are incorporated in the U.S. according to Compustat; 3) firms in financial industries (SIC codes 6000-6999) and utility industries are excluded (SIC codes 4900-4949); 4) firms with negative market values or book values of equity are excluded. Furthermore, we collect firm-level financial accounting information from Compustat, stock-related information from CRSP, and CEO compensation and ownership data from ExecuComp. After matching the SEO dataset, CEO network centrality dataset, Compustat and CRSP datasets, and excluding missing observations, our sample consists of 402,437 firm-month observations (4,472 unique firms) and 2,797 SEO events.

Figure 1 shows the annual distribution of SEO events in our sample from 2006 to 2024. We observe a general increase in SEO activities over this period, but not necessarily linearly. On average, there are 142 SEOs in our sample each year, with the frequency rising substantially from a low of 70

⁴ This is known as common stock SEOs. In this study, a common stock is indicated by CRSP share codes 10 or 11.

to a projected high of nearly 290 in 2024. The number of SEOs per year is relatively stable; however, we observe large variations, notably during the 2008–2009 financial crisis and the 2019–2022 COVID-19 pandemic. Overall, our sample transactions are distributed widely across different announcement years.

[Insert Figure 1, here]

2.2 Key Variable Construction

2.2.1 SEO Propensity, Announcement Returns, and Post-SEO Returns

In our first set of tests, we examine whether CEO network centrality affects a firm’s decision to conduct an SEO. We use a binary variable $SEO_{t \rightarrow t+1}$, which equals one if the firm i conducts an SEO in year t or the subsequent year $t+1$, and zero otherwise. This is because firm managers may require more time to conduct an SEO due to the SEC registration process or discovering or creating SEO demand (Khan et al., 2012). We also create a binary variable ($SEO_{i,t}$) that equals one if the firm i conducts an SEO in year-month t as an alternative measure for SEO propensity.

Second, this study uses the market model to measure the abnormal returns (ARs) for equity-issuing firms. We define SEO announcement effects as the cumulative abnormal returns (CAR), which are the total sum of the ARs during the event window $(-n, +n)$, where 0 represents the announcement day of the SEO. In our study, we use both three-day and five-day windows, proxied by $CAR (-1, +1)$ and $CAR (-2, +2)$, respectively, to ensure that our results are not affected by the estimation window. The following equations, Eq. (1) and (2), show the estimation.

$$AR_{i,t} = r_{i,t} - r_{e(i),t} \quad (1)$$

$$CAR_{i,t} = \sum_{t-n}^{t+n} AR_{i,t} \quad (2)$$

where $AR_{i,t}$ represents the abnormal return for firm i on day t . $r_{i,t}$ is the daily return of firm i on day t . and $r_{e(i),t}$ indicates the expected daily return estimated by the market model for firm i on day t .

Third, we estimate the post-SEO returns based on the buy-and-hold abnormal return (*BHAR*) model developed by Loughran and Ritter (1995). *BHAR* is the difference between the compounded actual return of the SEO firm and the compounded predicted return, measured by the following model Eq. (3).

$$BHAR_{i,t} = \prod_{t=1}^T [1 + R_{i,t}] - \prod_{t=1}^T [1 + R_{m(i),t}] \quad (3)$$

where $R_{i,t}$ indicates firm i monthly return in month t and $R_{m(i),t}$ is the weighted stock exchange index monthly return for firm i in month t . *BHAR* is calculated over 12, 24 and 36-month periods ($T = 12, 24, 36$) after the SEO announcement date.

2.2.2 CEO Network Centrality

Consistent with prior studies (El-Khatib et al., 2021; Fang et al., 2022; He, 2022), we employ *Degree* centrality as the primary proxy for CEO network centrality. This proxy is measured by counting the number of direct connections a node has with other nodes in the social network. Mathematically, *Degree* centrality $C_D(p_k)$ is defined by Eq. (4).

$$C_D(p_k) = \sum_{i=1}^n a(p_i, p_k) \quad (4)$$

where p_i and p_k are actors (nodes) in the social network. $a(p_i, p_k)$ is one if there is a social connection between actor p_i and actor p_k , and zero otherwise. This metric captures the number of individuals the CEO has in the network and assesses the direct connections between the CEO and other

individuals. *Ceteris paribus*, the more connections a CEO has, the better-connected CEO is within the network.

Our focus on *Degree* centrality is theoretically and empirically motivated by three key considerations. First, as both the *managerial learning* and *managerial opportunism* hypotheses fundamentally concern the informational advantages of CEOs, *Degree* centrality represents a widely adopted metric for assessing a CEO's network position and his or her capacity to efficiently gather and transfer information (El-Khatib et al., 2021; He, 2022). This measure reflects the intensity of potential information flows, making it ideally suited to test our two hypotheses. Second, *Degree* centrality constitutes the most straightforward and intuitive measure of a CEO's direct connections, which facilitates a clearer economic interpretation compared to more complex centrality measures that incorporate indirect connections or path dependencies (Fang et al., 2022). Third, *Degree* centrality has enough variation among different firms over the sample period, which is appropriate for regression analysis. For robustness, we also incorporate *Betweenness* centrality and *Eigenvector* centrality as the alternative measures of CEO network centrality, following established practices in finance and social network analysis (Schmidt, 2015; Bajo et al., 2020).

2.3 Model Specification

For the baseline regression model, we focus on whether CEO network centrality impacts the firm's propensity to conduct an SEO through the following probit model:

$$SEO_{t \rightarrow t+1} = b_0 + b_1 Degree_{i,t-1} + \sum_{k=2}^K b_k FIRM_CONTROL_{i,t-1} + v_t + v_j + \varepsilon_{i,t} \quad (5)$$

where $SEO_{t \rightarrow t+1}$ is a dummy variable that equals one if firm i conducts an SEO in year t or the subsequent year $t+1$, and zero otherwise. Our main variable of interest is $Degree_{i,t-1}$, which is the CEO

Degree centrality one year prior to the SEO announcement date.⁵ $FIRM_CONTROL_{i,t-1}$ is a vector of control variables, including firm size (*Size*), cash ratio (*Cash*), leverage ratio (*Lev*), asset tangibility (*Tangibility*), Amihud stock illiquidity (*Illiquidity*),⁶ annual sales growth rate (*SG*), and stock idiosyncratic volatility (*IVOL*), which are widely used controls in the existing SEO literature (see, Denis, 1994; Jung et al., 1996; Walker and Yost, 2008; Booth and Chang, 2011). Variables are winsorized at the 1st and 99th percentiles. The year fixed effects (ν_t) and the Fama-French 12-industry fixed effects (ν_j) are also included. Finally, the standard errors derived from Eq. (5) are clustered at the firm level.

2.4 Summary Statistics

Table 1 reports the summary statistics, including the number of observations (No. of Obs.), mean, standard deviation (Std. Dev.), the 25th, 50th (median), and 75th percentiles for the key variables.⁷ For SEO-related characteristics, the average frequency of a firm conducting an SEO is 6.0%, which is quantitatively similar to Evans et al. (2024). In line with previous literature (Jung et al., 1996; Kim and Purnanandam, 2014), we find that the average SEO announcement returns are negative, with an average of -3.8% for the three-day and -3.1% for the five-day *CARs*. For the post-SEO returns, the average 12-month, 24-month, and 36-month *BHARs* are -1.6%, -6.2% and -9.8%, respectively, which are also consistent with previous studies that document negative post-issuance returns (e.g., Loughran and Ritter, 1995; Spiess and Affleck-Graves, 1995; Jeanneret, 2005).

⁵ In our analysis, we follow previous studies (Iyer et al., 2020; Schabus, 2022; Evgeniou et al., 2022) to standardize the centrality measures for better interpretation of the results.

⁶ For better interpretations of the results, we multiply *Illiquidity* by 10^6 .

⁷ The summary statistics for the SEO sample is presented in Table OA.1 (see Online Appendix A).

Regarding our main variable of interest, the average *Degree* centrality is 169.20, indicating that a typical CEO in our sample is directly connected to approximately 169 individuals within their professional or educational networks. This value is broadly consistent with prior studies on U.S. firms (El-Khatib et al., 2015; El-Khatib et al., 2021; He, 2022). The firm size, with a mean value of 6.54, corresponds to total assets of approximately \$3.94 billion. On average, the sample firms in our study have a cash holding ratio of 20.98%, a market-to-book ratio of 4.14, a leverage ratio of 48.4%, an asset tangibility ratio of 23.31%, an Amihud (2002) illiquidity measure of 3.3%, a sales growth rate of 43.1%, and an idiosyncratic volatility of 13.4%. In addition, issuing firms have an average 7.3% stock price run-up prior to an SEO, and the natural logarithm of offering size is 17.6. The detailed definitions of the variables are included in Appendix A. The correlations between variables are relatively low in both the full sample and the SEO sample (see Table OA.2 in Online Appendix B), suggesting that multicollinearity is unlikely to be a significant concern in our empirical analyses.

[Insert Table 1, here]

3. Empirical Results

3.1 The Effect of CEO Network Centrality on SEO Propensity

3.1.1 Baseline Results

Table 2 reports the results of the baseline probit regression model, examining the relationship between CEO network centrality and SEO propensity. In column 1, the estimated coefficient of *Degree* is positive and significantly related to $SEO_{t \rightarrow t+1}$ at the 1% level, suggesting that well-connected CEOs are associated with increased SEO propensity from year t to year $t+1$. To place our results into

economic perspective, a one-standard-deviation increase in *Degree* is associated with a 9% increase in the likelihood of conducting an SEO in year t or the subsequent year. In column 2, we shorten the SEO event window by considering an alternative dependent variable $SEO_{i,t}$, which is a dummy variable that is equal to one if firm i conducts an SEO in year-month t . This alternative specification yields consistent results. Economically, a one-standard-deviation increase in *Degree* is associated with a 6.7% increase in the likelihood of conducting an SEO in year-month t . Moreover, we incorporate several managerial characteristics, such as CEO gender (*CEO_GENDER*), CEO age (*CEO_AGE*), CEO ownership (*CEO_OWN*), CEO total compensation (*CEO_PAY*), and CEO tenure (*CEO_TENURE*) to our baseline regression model as additional controls. In line with previous findings, the results in columns 3 and 4 show that *Degree* maintains a positive and significant impact on both $SEO_{t \rightarrow t+1}$ and $SEO_{i,t}$. We find a similar level of economic significance to that found in columns 1 and 2.

Based on these findings, the observed positive relation between CEO network centrality and SEO propensity provides supporting evidence for both the *managerial learning* and *managerial opportunism* hypotheses. These two hypotheses are not mutually exclusive, as the *managerial learning hypothesis* suggests that well-connected CEOs may identify superior investment opportunities through their network positions (Fracassi, 2017; Miranda-Lopez et al., 2019), leading to more frequent but value-enhancing SEOs. Alternatively, the *managerial opportunism hypothesis* posits that CEO network centrality could amplify their informational advantages for market timing and catering to investor demand (Derrien et al., 2013).

[Insert Table 2, here]

3.1.2 Robustness Tests

In this section, Table 3 presents several robustness tests for our baseline regression. We first use two alternative centrality measures, *Betweenness* centrality and *Eigenvector* centrality. *Betweenness* centrality quantifies the frequency with which an individual lies on the shortest path between any two other individuals in the network. A higher value of *Betweenness* represents higher centrality for a CEO. *Eigenvector* centrality assesses the importance of an individual within the network by considering both the quantity and quality of their connections. High *Eigenvector* centrality suggests that a CEO is embedded among other well-connected executives, potentially granting access to higher-quality or more diverse information. Rows 1 and 2 of Table 3 report the results, showing that both *Betweenness* and *Eigenvector* are positively related to a firm's propensity to conduct an SEO.

Following previous studies (El-Khatib et al., 2015; Miranda-Lopez et al., 2019), row 3 of Table 3 reports the results based on principal component analysis (PCA). The variable of interest is *Centrality_PCA*, which is a composite measure of CEO network centrality based on *Degree*, *Betweenness*, and *Eigenvector*. As expected, the results are robust, with the positive coefficient on *Centrality_PCA* at the 1% level. Row 4 replaces the current Fama-French 12-industry fixed effects with the Fama-French 48-industry classification. We find consistent results that *Degree* is positively and significantly related to both $SEO_{t \rightarrow t+1}$ and $SEO_{i,t}$.⁸

In row 5, we sort our full sample into quintiles based on the value of *Degree* centrality and create a binary variable (*High_Degree*) that is equal to one if the value of *Degree* centrality is in the top quintile of the portfolio, and zero otherwise. We replace *Degree* with *High_Degree* in the baseline regression model. As expected, the *High_Degree* is positively and significantly (at the 1% level)

⁸ The results are also qualitatively similar when using Fama-French 49-industry specifications as the industry FE. Results are available upon request.

related to $SEO_{t \rightarrow t+1}$ and $SEO_{i,t}$. This alternative specification confirms the positive relationship between a CEO's network position and equity issuance behavior.⁹ In row 6, we use a linear probability model (LPM) where the dependent variables are $SEO_{t \rightarrow t+1}$ and $SEO_{i,t}$, respectively. The coefficients on *Degree* remain positive and statistically significant.

In row 7, we assess the influence of small stocks by excluding firms with stock prices below \$3 at the end of the previous year. Row 8 excludes observations during the 2008–2009 global financial crisis (specifically, from the third quarter of 2008 to the fourth quarter of 2009) when market conditions were extremely volatile. The results are still robust after excluding these observations.

[Insert Table 3, here]

3.1.3 Addressing Endogeneity Concerns: Instrumental Variable Approach

The endogenous nature of CEO network centrality complicates the interpretation of our baseline results. To mitigate the endogeneity concerns related to reverse causality and omitted variables, we apply the Two-Stage Least Squares (2SLS) regression model through an instrumental variable (IV) approach to establish the causal relationship between CEO network centrality and SEO propensity. Following a similar logic to Faleye et al. (2014), we use the number of past sectors in which the CEO has worked (*NUM_SECTOR*) as our IV. CEOs with more work experience in different sectors might gain more connections, but such past experience is unlikely to have a direct effect on current firm-level SEO decision. The 2SLS methodology is implemented as follows. In the first stage, we run an OLS regression of *Degree* on the instrument (*NUM_SECTOR*) and other controls included in our

⁹ The results are also qualitatively similar when using top quintile and tercile as the threshold. Results are available upon request.

baseline regression Eq. (5). In the second stage, we conduct a regression of the propensity of conducting an SEO on the fitted value of *Degree* centrality from the first stage.

Table 4 presents the 2SLS estimation results. The first stage of the 2SLS analysis aims to verify the relevance of our instrument (*NUM_SECTOR*) where we examine the relationship between our instrument and the endogenous variable, CEO network centrality (*Degree*). As shown in column 1, the coefficient of *NUM_SECTOR* is positive and statistically significant at the 1% level, confirming a strong positive correlation between the instrument and the CEO's network centrality. The Kleibergen-Paap under-identification test (LM statistic = 133.320, p -value < 0.01) allows us to reject the null hypothesis of under-identification, indicating that our model is sufficiently identified. The Kleibergen-Paap F-statistic for weak identification is 159.157, providing strong evidence that our instrument is not a weak instrument. Furthermore, the second-stage results, reported in column 2, reveal a positive and statistically significant coefficient on the instrumented *Degree* variable (*Instrumented_Degree*). By employing the 2SLS method, we address potential endogeneity concerns related to reverse causality and omitted variables and document a strong positive causal relationship between CEO network centrality and a firm's propensity to conduct an SEO. Therefore, this provides more robust evidence for the baseline results.¹⁰

[Insert Table 4, here]

¹⁰ We find qualitatively similar results if we re-run the 2SLS with *SEO* as the dependent variable in the second stage. Results are available upon request.

3.1.4 The Moderating Effect of Corporate Governance

In this subsection, we test whether corporate governance plays an important role in moderating the relation between CEO network centrality and SEO propensity, which yields testable implications for our two hypotheses. Prior research shows that equity issuance is often related to agency problems, as managers may use the proceeds for agency spending rather than value-creating projects (Jung et al., 1996; Fu, 2010; Kim and Purnanandam, 2014). If CEO network centrality is associated with diminished oversight that amplifies agency problems (Fracassi and Tate, 2012; He, 2022), high-centrality CEOs should exhibit a greater SEO propensity specifically in weak governance environments. Conversely, evidence suggests strong corporate governance could increase the likelihood of equity issuance by reducing monitoring costs and thus lowering the cost of equity capital (Chen et al., 2009; Mande et al., 2012). Therefore, we propose that the positive relationship between CEO network centrality and SEO propensity should be enhanced (mitigated) by weak corporate governance.

We consider three proxies for corporate governance: board size, institutional ownership, and short selling.¹¹ First, studies have shown that smaller (larger) boards are associated with stronger (weaker) monitoring of managerial behavior (Jensen, 1993; Yermack, 1996). Thus, board size is measured as the number of directors on the board and we create a binary variable called *Large_board* that is equal to one if the board size of the firm is greater than the median size of the board, and zero otherwise. Second, we consider the monitoring effect of institutional investors. Higher (lower) institutional ownership is associated with stronger (weaker) corporate governance (Demiralp et al.,

¹¹ We obtain board information from BoardEx, institutional ownership from 13f, and short interest data from the Compustat supplemental short interest file.

2011; Chung and Zhang, 2011). Institutional ownership is defined as the aggregate number of shares held by institutional investors divided by the total number of shares outstanding. Accordingly, we create a binary variable (*Low_IO*) that equals one if the institutional ownership of the firm is below its median value, and zero otherwise. Third, studies indicate the disciplining role of short sellers, suggesting that high short selling pressure leads managers to exercise greater caution in decision-making (Shi et al., 2021; Wang et al., 2022). Following Shi et al. (2021), we proxy short selling using the short interest ratio, which is the number of shorted shares divided by the total number of outstanding shares. We also create a binary variable, *Low_SIR*, which equals one if the short interest ratio of the firm is lower than its median value, and zero otherwise. We add the corporate governance dummies (*Large_board*, *Low_IO*, and *Low_SIR*) and their interaction terms with *Degree* in our baseline regression model Eq. (5).

Table 5 reports the estimation results for the moderating effect of corporate governance on the relationship between CEO network centrality and SEO propensity. The analysis reveals consistently positive and statistically significant ($p < 0.01$) interaction terms across all six model specifications. These findings indicate that the positive association between CEO network centrality and equity issuance likelihood is particularly pronounced in firms characterized by weak governance structures - specifically those with larger board sizes, lower institutional ownership, and limited short-selling pressure. We interpret these results as indirect supporting evidence for the *managerial opportunism hypothesis*, demonstrating that weak governance environments offer well-connected CEOs more flexibility to engage in opportunistic equity issuance.

[Insert Table 5, here]

3.2 Economic Mechanism

In our baseline results, we document a positive and significant relationship between CEO network centrality and SEO propensity. This finding alone cannot distinguish between the *managerial learning* and *managerial opportunism* hypotheses, as both predict increased equity issuance likelihood with well-connected CEOs. Consequently, we examine the underlying mechanism by analyzing the impact of CEO network centrality on both short-term market reactions and long-term post-issuance performance. This allows us to assess whether connected CEOs utilize their informational advantages to identify valuable growth opportunities (as predicted by the *learning hypothesis*) or cater to market timing (as suggested by the *opportunism hypothesis*), providing critical insight into the underlying economic motives driving the observed issuance patterns. Accordingly, we investigate the role of CEO network centrality on SEO cumulative abnormal returns (*CAR*) and buy-and-hold abnormal returns (*BHAR*) using the following cross-sectional ordinary least squares (OLS) regression:

$$\begin{aligned}
 CAR_{i,t}/BHAR_{i,t+n} = & b_0 + b_1 Degree_{i,t-1} + \sum_{k=2}^K b_k FIRM_CONTROL_{i,t-1} \\
 & + \sum_{k=3}^K b_k SEO_CONTROL_{i,t} + v_t + v_j + \varepsilon_{i,t}
 \end{aligned} \tag{6}$$

where i indexes firm i and t represents the announcement year. *CAR* is the SEO announcement effect which is estimated through a three-day window *CAR* $(-1, +1)$ and a five-day window *CAR* $(-2, +2)$ using the market model. *BHAR* is the post-SEO return proxied by equity issuing firms' buy-and-hold abnormal returns ($n=12$ -, 24 -, 36 -month), respectively. In Eq. (6), the firm controls are *Size*, *Cash*, *Lev*, *Tangibility*, *Illiquidity*, *SG* and *IVOL*, and the SEO controls include the stock price run-up 60 trading days before the SEO announcement date (*RUNUP*), and the natural logarithm of SEO offer proceeds

($\ln(\text{Proceeds})$). Similarly, the year and Fama-French 12-industry fixed effects are also included. $\varepsilon_{i,t}$ represents the standard errors, clustered at the firm's level.

3.2.1 CEO Network Centrality and SEO Announcement Returns

For SEO announcement returns, the stock market will react favorably to equity issuance that signal valuable growth prospects (Myers and Majluf, 1984; Cooney and Kalay, 1993; Jung et al., 1996; Walker and Yost, 2008). However, if managers successfully cater to investors, this could also lead to positive announcement returns, which may alternatively reflect the successful exploitation of investor optimism through strategic market timing (Manconi and Massa, 2013). Consequently, firms with high-centrality CEOs may experience positive SEO announcement returns, as CEO network centrality enhances either the credible signaling of investment opportunities or the strategic amplification of catering effects.

Table 6 reports the results from the cross-sectional OLS regressions examining the relation between CEO network centrality and SEO announcement returns. In column 1, the coefficient on *Degree* is positive and significant at the 5% level. Furthermore, we use a longer event window with *CAR* (-2, +2) in column 2 and find that CEO network centrality is still positively and significantly related to SEO announcement returns, suggesting that our results are robust and not driven by the specific event window chosen for estimation. Regarding the economic significance, we find that a one-standard-deviation increase in *Degree* increases *CAR* (-1, +1) and (*CAR* (-2, +2)) by 0.7% and 0.8%, respectively.

To sum up, these results can be explained by both theoretical lenses where the *managerial learning hypothesis* predicts positive returns due to market recognition of network-identified growth

opportunities, while the *managerial opportunism hypothesis* proposes that the positive announcement effects represent successful catering to investor sentiment. The economic magnitude suggests that CEO network centrality has significant impacts on market perceptions of equity offerings, regardless of the underlying mechanism. The coexistence of these explanations motivates us to evaluate the long-term performance to distinguish their relative importance.

[Insert Table 6, here]

3.2.2 CEO Network Centrality and Post-SEO Returns

In this section, we investigate the long-run post-SEO returns. This investigation is of particular importance for the following reasons. First, SEO announcement returns only capture short-horizon market reactions; therefore, examining performance over a longer event window provides a different perspective on the performance of issuing firms. Second, given the difficulty in estimating information asymmetry or catering motives prior to an SEO, post-SEO performance is often used to infer the ex-ante motivation. Third, the analysis of post-SEO returns can help us distinguish between the two main hypotheses proposed in this study. SEO firms tend to experience price run-ups prior to SEO and then perform poorly in the years following SEO, which is typically interpreted as successful catering to market timing.

The *managerial learning hypothesis* suggests that CEO network centrality can improve corporate decision-making (Engelberg et al., 2012; Faleye et al., 2014; Rossi et al., 2018) and reduce information asymmetry for market participants (Egginton et al., 2022). Under this hypothesis, if well-connected CEOs make informed SEO decisions, the post-SEO returns of issuing firms should be

positive. However, if CEO network centrality amplifies managerial market-timing ability (Evgeniou et al., 2022) and agency problems (Renneboog and Zhao, 2011; He, 2022), it provides well-connected CEOs with more flexibility for opportunistic SEOs that are detrimental to shareholder value. Consequently, this is captured by the *managerial opportunism hypothesis*, which predicts negative post-SEO returns.

Table 7 shows the results for the effects of CEO network centrality on post-SEO performance. From columns 1 to 3, the dependent variables are the post-SEO returns over 12, 24 and 36 months, respectively. The negative and statistically significant coefficients on *Degree* across all specifications demonstrate that CEO network centrality is associated with lower long-run returns after SEOs. This value-destroying effect becomes notably larger over time. To interpret our results from an economic perspective, a one-standard-deviation increase in *Degree* decreases *BHAR12*, *BHAR24*, and *BHAR36* of issuing firms by 4.7%, 4.1%, and 6.5%, respectively. This is equivalent to a loss of \$244.4, \$212.7, and \$339.6 million in shareholder wealth relative to the average firm size.¹² This value-destroying effect aligns with the *managerial opportunism hypothesis*, suggesting that well-connected CEOs exploit informational advantages to time equity issuances to cater to investors at the expense of long-term firm value.

[Insert Table 7, here]

¹² The average firm size in the SEO sample is close to \$5.2 billion at the end of the fiscal year preceding the SEO announcement. The wealth effect is calculated by multiplying the coefficient of *Degree* in Table 7 and the average firm size (e.g., for *BHAR12* – $0.047 \times \$5.2$ billion).

3.2.3 Addressing Self-selection Bias

Since CEO network centrality affects the probability of an SEO announcement, as demonstrated in Table 2, self-selection bias could arise if the firms that choose to engage in SEOs may differ from non-issuing firms in ways that correlate with our variables of interest. To address this potential selection bias, we use the Heckman (1979) two-stage approach to address the potential self-selection bias. First, we estimate the probit model of the choice of issuing equity as in Eq. (5), where the dependent variable is $SEO_{t \rightarrow t+1}$, controlling for firm-specific characteristics to obtain the inverse Mills ratio (IMR). In the second stage, this study estimates the OLS regression in Eq. (6) and adds the IMR as an additional control to account for potential self-selection bias.

The results in Table 8 reveal that our findings in Tables 6 and 7 remain robust after accounting for potential selection bias. The coefficients on *Degree* centrality remain positive and statistically significant for *CARs* and negative and statistically significant for *BHARs* across all model specifications, underscoring the robustness of our core findings. Importantly, the coefficients on the IMR are statistically insignificant, indicating that our results are not subject to self-selection bias. This analysis confirms that the role of CEO network centrality in shaping SEO outcomes reflects genuine economic mechanisms net of the self-selection bias. The catering-to-market-timing channel thus appears robust to alternative explanations rooted in selection effects or unobserved heterogeneity.

[Insert Table 8, here]

4. Further Analysis

4.1 CEO Network Centrality and Investment Efficiency

Our main analysis reveals that CEOs occupying central network positions exhibit both a greater propensity for equity issuance and a tendency to generate value-destroying outcomes for shareholders. The *managerial opportunism hypothesis* posits that well-connected executives exploit their informational and positional advantages to strategically time equity offerings. By creating inflated expectations of growth prospects through such market timing behavior, we argue that well-connected CEOs engage in excessive investment that ultimately erodes long-term shareholder value. This pattern of results corroborates existing evidence that firm equity issuance, driven by market timing, managerial catering, or a combination of the two, is presumed to lead to overinvestment (Gilchrist et al., 2005; Alzahrani and Rao, 2014). We perform an OLS analysis regressing an accounting-based measure of over-investment (Richardson, 2006) on *Degree* centrality, controlling for firm- and SEO-specific control variables, as well as industry and year fixed effects.

Table 9 presents the relationship between CEO network centrality and corporate investment efficiency for issuing firms. Our analysis reveals a statistically significant and positive association between CEO network centrality and firm-level overinvestment. The results suggest that the information advantages derived from CEO social networks facilitate excessive investment that prioritizes market timing and catering to short-term market perceptions at the expense of long-term value maximization, which is consistent with the *managerial opportunism hypothesis*. In Online Appendices C and D, we conduct supplementary analyses to assess whether CEO network centrality correlates with either promising growth opportunities or high investment sentiment among issuing firms. The results presented in Table OA.3 fail to support the growth opportunity explanation; however,

the findings in Table OA.4 provide support for the sentiment channel.

[Insert Table 9, here]

4.2 CEO Network Centrality and Stock Price Crash Following SEOs

The extant literature on bad news hoarding suggests that corporate managers strategically control the release of negative information to maintain inflated stock prices (e.g., Jin and Myers, 2006; Hutton et al., 2009). A core assumption underlying this perspective is that the managers can strategically misguide corporate news flow, enabling the deliberate shaping of market perceptions. When accumulated bad news eventually reaches a threshold level that managers can no longer sustain, it spills into the market in an abrupt fashion, resulting in stock price crashes. Since well-connected CEOs have substantial control over the transmission of firm-specific news, we argue that the withholding of bad news may complement the opportunistic catering of market timing, making issuing firms prone to stock price crashes.

To empirically examine this proposition, we employ *Crash* as our primary dependent variable, which is a binary variable set equal to one if a firm that experiences one or more crash weeks during the fiscal-year period, and zero otherwise. Following Hutton et al. (2009), we first estimate firm-specific weekly returns using the following model:

$$r_{i,w} = \alpha_i + \beta_{1,i}r_{M,w-2} + \beta_{2,i}r_{M,w-1} + \beta_{3,i}r_{M,w} + \beta_{4,i}r_{M,w+1} + \beta_{5,i}r_{M,w+2} + \varepsilon_{i,w} \quad (7)$$

where $r_{i,w}$ is the return on firm i in week w , and r_M is the weekly return on the CRSP value-weighted market index. To define firm-specific returns, we take the natural logarithm of one plus the residual from Eq. (7). We then construct our crash-risk variable, *Crash*, as a binary variable equal to one if a

firm experiences one or more crash weekly return that falls more than 3.09 standard deviations below the mean firm-specific weekly return over the estimation period, and zero otherwise. For robustness, we also define *Crash_3.2* as a binary variable equal to one if a firm experiences one or more crash weekly return that falls more than 3.2 standard deviations below the mean firm-specific weekly return over the estimation period, and zero otherwise.

Table 10 presents the results of our logit regression analysis examining the relationship between CEO network centrality and post-SEO crash risk. Consistent with our previous setting, we measure the stock price crash risk at 12-, 24- and 36-month following the SEO. As expected, the coefficients on *Degree* are positive and significant in all specifications, indicating that issuing firms with well-connected CEOs are associated with substantially higher probabilities of experiencing stock price crashes after SEOs. CEO network centrality appears to amplify managerial bad-news-hoarding behavior. Economically, a one-standard-deviation increase in *Degree* raises the probability of stock price crashes by an average of 20%, 17%, and 15%, respectively, at 12, 24 and 36 months after the SEO announcement. These findings provide critical corroboration of our earlier results, as CEO network centrality facilitates managerial opportunism in SEO decisions through improved market timing ability and greater bad news hoarding that ultimately destroys shareholder value.

[Insert Table 10, here]

4.3 CEO Network Centrality and Post-SEO Operating Performance

To provide greater insight into the relationship between CEO network centrality in SEOs and the long-run performance, we estimate a series of OLS regressions to test whether issuing firms experience

statistically significant declines in their operating performance. We choose industry-adjusted accounting performance as our measure to avoid the confounding problems that stock returns raise when used to proxy for future firm performance in this setting. Specifically, industry-adjusted operating performance (measured by industry-adjusted free cash flow (*CF*) and industry-adjusted return on assets (*ROA*)) is constructed as the difference between the firm's operating performance (*CF* or *ROA*) and that of the median firm in the same industry in a given year *t*. Consistent with our previous setting, we also estimate the adjusted operating performance over a 36-month post-issuance period.

Focusing on equity issuing firms, the results from columns 1 to 6 of Table 11 show that the coefficients of *Degree* in the regressions of both *ADJ_CF* and *ADJ_ROA* are significantly negative. This indicates that firms with well-connected CEOs experience a significant decline in operating performance relative to their industry peers after conducting an SEO. These findings further confirm our previous finding of the post-issuance underperformance.¹³

[Insert Table 11, here]

4.4 Alternative Explanation – CEO Power

While our primary focus lies in examining the effects of CEO network centrality, it is crucial to address the potential confounding influence of broader dimensions of CEO power. Previous research suggests that an individual's centrality in a network is an important source of power which represents a high position in a status hierarchy (Freeman, 1978; Brass, 1992; Renneboog and Zhao, 2011). To ensure that the observed effect of CEO network centrality on SEO propensity is not driven by CEO

¹³ When we add *IMR* as the control variable in the overinvestment, crash risk, and operating performance analyses, the results are qualitatively similar. Results are available upon request.

power, we include CEO tenure (*CEO_TENURE*) and CEO-Chair duality (*CEO_DUA*),¹⁴ and further examine their interaction terms with the *Degree* centrality in our baseline model Eq. (5).

Table 12 presents the results. Across all specifications, the interaction terms between *Degree* and the two CEO power proxies are statistically insignificant. This suggests that the positive association between CEO network centrality and the SEO propensity is not driven by general CEO power characteristics. In particular, the influence of CEO network centrality appears to operate through channels distinct from those implied by entrenchment or managerial influential power, underscoring its independent explanatory value in shaping equity issuance behavior.

[Insert Table 12, here]

5. Conclusion

This study provides a direct test of whether CEO network centrality is associated with better decision-making in the context of SEOs, a setting where managerial private information and agency conflicts of interest between managers and shareholders are likely to emerge. Using a large sample of U.S. firms from 2006 to 2024, we first find that well-connected CEOs exhibit a significantly higher propensity to conduct SEOs. This positive relationship is particularly strong in firms with weak governance, characterized by larger boards, lower institutional ownership, and limited short-selling pressure. This pattern aligns with the agency-based perspective on equity issuance (Jung et al., 1996; Kim and Purnanandam, 2014).

¹⁴ CEO tenure and CEO duality are two widely used proxies for CEO power (see Sauerwald et al., 2016; Korkeamäki et al., 2017; Graham et al., 2020).

Moreover, we investigate the underlying mechanisms behind this positive relationship by examining the SEO announcement effect and post-SEO returns. In line with our *managerial opportunism hypothesis*, we find that issuing firms with high CEO network centrality obtain positive SEO announcement returns but experience severe long-term underperformance. In our additional analysis, the results reveal that issuing firms with high-centrality CEOs are associated with overinvestment problems, a higher likelihood of experiencing stock price crashes, and poorer industry-adjusted operating performance following SEOs. This provides further support for the *managerial opportunism hypothesis*, as these SEOs are mainly driven by managerial opportunistic behavior that will ultimately destroy shareholder value.

Overall, our study presents a theoretically consistent and empirically robust narrative regarding the “dark” side of CEO network centrality in corporate equity issuance decisions. We demonstrate that well-connected executives leverage their informational and positional advantages to engage in strategic market timing, overinvestment, and the withholding of negative information, all of which ultimately destroy shareholder value. Our findings are economically significant and offer important implications for CEO selection and corporate governance.

Appendix A. Variable definitions

Variables	Definition	Source
$SEO_{t \rightarrow t+1}$	A binary variable that equals one if firm i conducts an SEO in year t or the following year $t+1$, and 0 otherwise.	SDC
$SEO_{i,t}$	A binary variable that equals one if firm i conducts an SEO in year-month t , and 0 otherwise.	SDC
CAR	The cumulative abnormal returns based on the market model.	CRSP
$BHAR$	The buy-and-hold abnormal returns.	CRSP
$OVERINVEST$	An accounting-based measure of over-investment, following Richardson (2006).	Compustat
$Crash$	A binary variable that equals one if a firm experiences one or more crash weekly return that falls more than 3.09 standard deviation below the mean firm-specific weekly return over the estimation period, and zero otherwise.	CRSP and Fama-French data library
$Crash_{3.2}$	A binary variable that equals one if a firm experiences one or more crash weekly return that falls more than 3.2 standard deviation below the mean firm-specific weekly return over the estimation period, and zero otherwise.	CRSP and Fama-French data library
$Degree$	The <i>Degree</i> centrality.	BoardEx
$Eigenvector$	The <i>Eigenvector</i> centrality.	BoardEx
$Betweenness$	The <i>Betweenness</i> centrality.	BoardEx
$Size$	Firm size, defined as the natural logarithm of total assets.	Compustat
$Cash$	Firm cash ratio, defined as cash and short-term investments divided by total assets.	Compustat
MB	Firm market-to-book ratio, defined as the market capitalization divided by the book value of equity.	Compustat
Lev	Firm leverage ratio, defined as total liabilities divided by total assets.	Compustat
$Tangibility$	Firm asset tangibility, defined as the total property, plant, and equipment divided by total assets.	Compustat
$Illiquidity$	Firm stock illiquidity following Amihud (2002).	CRSP
SG	Firm annual sales growth.	Compustat
$IVOL$	Firm idiosyncratic volatility. It is the standard deviation of the residuals from a regression of a firm's weekly stock returns on the weekly returns of the market portfolio.	CRSP
$RUNUP$	Firm stock price run-up 60 trading days prior to the SEO announcement date.	CRSP
$Ln(Proceeds)$	The natural logarithm of SEO proceeds.	SDC
CEO_GENDER	A binary variable that equals one if the gender of the CEO is female, and zero otherwise.	ExecuComp

<i>CEO_AGE</i>	The age of the CEO.	ExecuComp
<i>CEO_OWN</i>	CEO stock ownership.	ExecuComp
<i>CEO_PAY</i>	CEO total compensation.	ExecuComp
<i>CEO_TENURE</i>	The number of years of a CEO has served in this role.	BoardEx
<i>CEO_DUA</i>	A binary variable that equals one if the CEO is also the chairman of the board, and zero otherwise.	ExecuComp
<i>Large_board</i>	A binary variable that equals one if the board size of the firm is above the median sample size of the board, and zero otherwise.	BoardEx
<i>Low_IO</i>	A binary variable that equals one if the institutional ownership of the firm is below the median value, and zero otherwise.	13f
<i>Low_SIR</i>	A binary variable that equals one if the short interest ratio of the firm is below the median value, and zero otherwise.	Compustat supplemental short interest file
<i>IMR</i>	The inverse Mills ratio.	Authors' calculation
<i>NUM_SECTOR</i>	The number of past sectors in which the CEO has worked.	BoardEx
<i>ADJ_CF</i>	Industry-adjusted free cash flow, which is measured by the difference between a firm's free cash flow and that of the median firm in the industry in which that firm operates in a given year.	Compustat
<i>ADJ_ROA</i>	Industry-adjusted return on assets, which is measured by the difference between a firm's return on assets and that of the median firm in the industry in which that firm operates in a given year.	Compustat

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Figure 1. SEO Distribution

This figure reports the number of SEOs by year. The sample period is from January 2006 to December 2024.

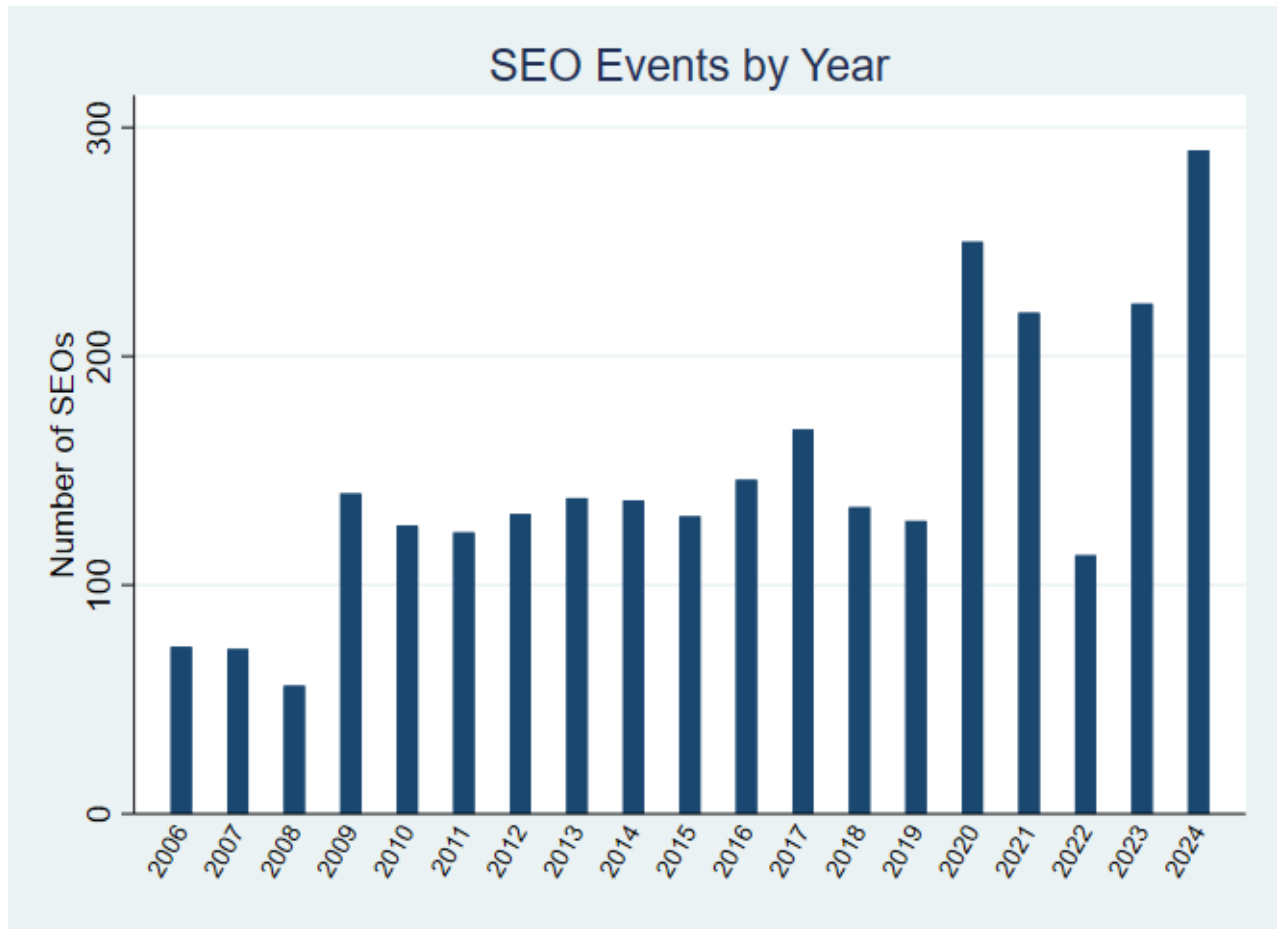


Table 1
Summary statistics

This table presents firm-level summary statistics. For each variable, we report the number of observations (No. of Obs.), the mean, standard deviation (Std. Dev.), 25th percentile, median, and 75th percentile. Detailed definitions of each variable are provided in Appendix A.

	No. of Obs.	Mean	Std. Dev.	p25	Median	p75
<i>SEO_{t→t+1}</i>	402,437	0.060	0.237	0.000	0.000	0.000
<i>Degree</i>	402,437	169.197	309.150	26.000	61.000	161.000
<i>Size</i>	402,437	6.539	2.029	5.071	6.577	7.968
<i>Cash</i>	402,437	0.210	0.221	0.043	0.128	0.302
<i>MB</i>	402,437	4.139	6.180	1.415	2.349	4.152
<i>Lev</i>	402,437	0.484	0.220	0.312	0.489	0.642
<i>Tangibility</i>	402,437	0.233	0.220	0.070	0.154	0.327
<i>Illiquidity</i>	402,437	3.294	0.239	0.006	0.045	0.448
<i>SG</i>	402,437	0.431	1.556	-0.026	0.148	0.403
<i>IVOL</i>	402,437	0.134	0.066	0.088	0.119	0.164
<i>CAR (-1, +1)</i>	2,769	-0.038	0.218	-0.100	-0.029	0.017
<i>CAR (-2, +2)</i>	2,768	-0.031	0.275	-0.113	-0.030	0.025
<i>BHAR12</i>	2,406	-0.016	1.498	-0.628	-0.248	0.157
<i>BHAR24</i>	2,176	-0.062	1.427	-0.628	-0.257	0.167
<i>BHAR36</i>	2,099	-0.098	2.121	-0.821	-0.374	0.138
<i>RUNUP</i>	2,769	0.073	0.612	-0.181	0.022	0.259
<i>Ln(Proceeds)</i>	2,671	17.575	2.086	15.985	17.738	19.082

Table 2

Baseline regression: the effect of CEO network centrality on SEO propensity

This table presents probit estimates of the relation between CEO network centrality and SEO propensity. The dependent variables are $SEO_{t \rightarrow t+1}$ and $SEO_{i,t}$. The independent variable is CEO network centrality, proxied by *Degree*. Industry and year fixed effects are included. Heteroskedasticity-robust t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Detailed definitions of each variable are provided in Appendix A.

	$SEO_{t \rightarrow t+1}$	$SEO_{i,t}$	$SEO_{t \rightarrow t+1}$	$SEO_{i,t}$
	(1)	(2)	(3)	(4)
<i>Degree</i>	0.090*** (4.725)	0.067*** (4.677)	0.108*** (5.021)	0.079*** (4.661)
<i>Size</i>	-0.003 (-0.215)	-0.014 (-1.286)	0.071*** (2.866)	0.056*** (2.802)
<i>Cash</i>	0.537*** (5.777)	0.337*** (5.408)	0.364* (1.772)	0.233 (1.483)
<i>MB</i>	-0.001 (-0.265)	-0.001 (-0.668)	-0.003 (-0.915)	-0.004 (-1.465)
<i>Lev</i>	0.245*** (2.663)	0.247*** (3.501)	0.259 (1.639)	0.253* (1.930)
<i>Tangibility</i>	0.179* (1.679)	0.175* (1.960)	0.133 (0.849)	0.102 (0.799)
<i>Illiquidity</i>	-0.033 (-0.786)	-0.073* (-1.893)	0.406** (1.960)	0.267** (2.216)
<i>SG</i>	0.019*** (3.138)	0.011*** (2.870)	0.056*** (4.057)	0.034*** (3.764)
<i>IVOL</i>	3.624*** (11.751)	2.464*** (12.615)	3.830*** (6.538)	2.699*** (6.608)
<i>CEO_GENDER</i>			-0.136 (-1.177)	-0.092 (-0.860)
<i>CEO_AGE</i>			-0.003 (-0.785)	-0.004 (-1.237)
<i>CEO_OWEN</i>			0.001 (0.370)	-0.001 (-0.343)
<i>CEO_PAY</i>			-0.045** (-2.178)	-0.046*** (-3.036)
<i>CEO_TENURE</i>			0.001 (0.396)	-0.001 (-0.169)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
No. of Obs.	402,437	402,437	189,120	189,120
Pseudo R ²	0.106	0.075	0.073	0.050

Table 3**Robustness tests: the effect of CEO network centrality on SEO propensity**

This table presents the robustness of the baseline results. The dependent variables are $SEO_{t \rightarrow t+1}$ and $SEO_{i,t}$. Rows 1 and 2 apply alternative centrality measures, *Eigenvector* and *Betweenness*, as the independent variables, respectively. Row 3 applies composite measures of CEO network centrality (including *Degree*, *Eigenvector*, and *Betweenness*) through PCA methods. Row 4 replaces the industry FE with the Fama–French 48-industry classification. Row 5 uses the quintile of *Degree* as the independent variable. Row 6 uses a linear probability model (*LPM*) where the independent variable is *Degree*. In rows 7 and 8, we exclude firms with stock prices below \$3, and observations from the financial crisis period (2008Q3–2009Q4). Heteroskedasticity-robust t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Detailed definitions of each variable are provided in Appendix A.

Row	$SEO_{t \rightarrow t+1}$			$SEO_{i,t}$		
	Coef.	Pseudo R ²	No. of Obs.	Coef.	Pseudo R ²	No. of Obs.
1. <i>Eigenvector</i>	0.031** (1.9754)	0.102	402,437	0.021** (2.000)	0.072	402,437
2. <i>Betweenness</i>	0.090*** (5.359)	0.105	402,437	0.069*** (5.083)	0.075	402,437
3. <i>Centrality_PCA</i>	0.055*** (5.102)	0.105	402,437	0.041*** (5.434)	0.074	402,437
4. <i>48-Industry</i>	0.090*** (4.750)	0.121	402,437	0.067*** (4.680)	0.085	402,437
5. <i>Top quintile of Degree</i>	0.017*** (3.338)	0.230	402,437	0.118*** (3.560)	0.073	402,437
6. <i>LPM</i>	0.011*** (3.712)	0.230	402,437	0.001*** (3.623)	0.008	402,437
7. <i>Exclude stock prices < \$3</i>	0.088*** (4.656)	0.102	401,673	0.053*** (3.825)	0.057	401,673
8. <i>Exclude the crisis period</i>	0.090*** (4.732)	0.113	367,009	0.068*** (4.737)	0.077	367,009

Table 4
Instrumental variable approach

This table presents the results based on the instrumental variable approach to address endogeneity issues related to reverse causality and omitted variables. Column 1 reports the first-stage regression of *Degree* on the instrument *NUM_SECTOR*. In column 2, the second-stage regression results are reported where the dependent variable is $SEO_{t \rightarrow t+1}$. Heteroskedasticity-robust t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Detailed definitions of each variable are provided in Appendix A.

	First stage	Second stage
	<i>Degree</i>	$SEO_{t \rightarrow t+1}$
	(1)	(2)
<i>NUM_SECTOR</i>	0.075*** (12.616)	
<i>Instrumented_Degree</i>		0.047*** (3.591)
Firm Controls	Yes	Yes
Year FE	Yes	Yes
Industry FE	Yes	Yes
No. of Obs.	356,030	356,030
Under-identification test		
Kleibergen-Paap LM statistic		133.320***
Weak identification test		
Kleibergen-Paap rk Wald F-statistic		159.157***

Table 5

Cross-section heterogeneity: the effect of corporate governance

This table examines the moderating effect of corporate governance on the effect of CEO network centrality on SEO propensity. The dependent variables are $SEO_{t \rightarrow t+1}$ and $SEO_{i,t}$. The key variables of interest are the interaction terms between *Degree* and the corporate governance dummies (*Large_board*, *Low_IO*, and *Low_SIR*). Heteroskedasticity-robust t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Detailed definitions of each variable are provided in Appendix A.

	$SEO_{t \rightarrow t+1}$	$SEO_{t \rightarrow t+1}$	$SEO_{t \rightarrow t+1}$	$SEO_{i,t}$	$SEO_{i,t}$	$SEO_{i,t}$
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Degree</i>	-0.022 (-0.784)	0.036 (1.635)	0.007 (0.327)	-0.013 (-0.592)	0.030* (1.886)	-0.005 (-0.286)
<i>Large_board</i>	0.101*** (2.668)			0.087*** (2.843)		
<i>Degree</i> × <i>Large_board</i>	0.143*** (4.164)			0.103*** (3.884)		
<i>Low_IO</i>		0.313*** (7.636)			0.247*** (7.655)	
<i>Degree</i> × <i>Low_IO</i>		0.057* (1.783)			0.038* (1.630)	
<i>Low_SIR</i>			-0.062* (-1.832)			-0.045 (-1.624)
<i>Degree</i> × <i>Low_SIR</i>			0.138*** (4.650)			0.117*** (5.240)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
No. of Obs.	333,666	311,692	336,165	333,666	311,692	336,165
Pseudo R ²	0.109	0.120	0.109	0.080	0.087	0.079

Table 6
CEO network centrality and SEO announcement returns

This table reports the estimation results of cross-sectional OLS models examining the relationship between CEO network centrality and SEO announcement returns. The dependent variables are *CAR* ($-1 + 1$) and *CAR* ($-2 + 2$). The independent variable is CEO network centrality, proxied by *Degree*. Heteroskedasticity-robust t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Detailed definitions of each variable are provided in Appendix A.

	<i>CAR</i> ($-1 + 1$)	<i>CAR</i> ($-2 + 2$)
	(1)	(2)
<i>Degree</i>	0.007** (2.344)	0.008** (2.336)
Firm Controls	Yes	Yes
SEO Controls	Yes	Yes
Year FE	Yes	Yes
Industry FE	Yes	Yes
No. of Obs.	2,642	2,641
R ²	0.123	0.159

Table 7
CEO network centrality and post-SEO returns

This table reports the estimation results of cross-sectional OLS models examining the relationship between CEO network centrality and post-SEO returns. The dependent variables are *BHAR12*, *BHAR24* and *BHAR36*. The independent variable is CEO network centrality, proxied by *Degree*. Heteroskedasticity-robust t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Detailed definitions of each variable are provided in Appendix A.

	<i>BHAR12</i>	<i>BHAR24</i>	<i>BHAR36</i>
	(1)	(2)	(3)
<i>Degree</i>	-0.047* (-1.700)	-0.041* (-1.711)	-0.065** (-2.264)
Firm Controls	Yes	Yes	Yes
SEO Controls	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
No. of Obs.	2,288	2,078	2,008
R ²	0.032	0.038	0.019

Table 8
Addressing self-selection bias

This table reports the estimation results of cross-sectional OLS models examining the relationship between CEO network centrality and SEO announcements (post-SEO returns) by addressing self-selection bias. Following the Heckman two-stage regression model, the inverse Mills ratio (*IMR*) is derived from the selection model. From columns 1 to 5, the dependent variables are *CAR* (-1 +1), *CAR* (-2 +2), *BHAR12*, *BHAR24*, and *BHAR36*, and we add *IMR* as an additional control to account for the self-selection bias. The independent variables are CEO network centrality, proxied by *Degree*. Heteroskedasticity-robust t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Detailed definitions of each variable are provided in Appendix A.

	Second stage	Second stage	Second stage	Second stage	Second stage
	<i>CAR</i> (-1, +1)	<i>CAR</i> (-2, +2)	<i>BHAR12</i>	<i>BHAR24</i>	<i>BHAR36</i>
	(1)	(2)	(3)	(4)	(5)
<i>Degree</i>	0.007** (2.359)	0.007** (2.266)	-0.045* (-1.656)	-0.039* (-1.661)	-0.064** (-2.219)
<i>IMR</i>	0.118 (0.226)	0.653 (0.982)	-0.042 (-1.384)	-0.043 (-1.552)	-0.029 (-0.928)
Firm Controls	Yes	Yes	Yes	Yes	Yes
SEO Controls	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
No. of Obs.	2,642	2,641	2,288	2,078	2,008
R ²	0.123	0.160	0.034	0.040	0.019

Table 9
CEO network centrality and overinvestment

This table reports the estimation results of cross-sectional OLS models examining the relationship between CEO network centrality and firm overinvestment. The dependent variable is *OVERINVEST*. The independent variable is CEO network centrality, proxied by *Degree*. Heteroskedasticity-robust t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Detailed definitions of each variable are provided in Appendix A.

	<i>OVERINVEST</i>	<i>OVERINVEST</i>
	(1)	(2)
<i>Degree</i>	0.393*** (5.525)	0.088* (1.885)
Firm Controls	No	Yes
SEO Controls	No	Yes
Year FE	Yes	Yes
Industry FE	Yes	Yes
No. of Obs.	922	879
R ²	0.250	0.498

Table 10
CEO network centrality and Stock price crash risk

This table reports the estimation results of logit models examining the relationship between CEO network centrality and stock price crash risk. The dependent variables are *Crash* and *Crash_3.2*. The independent variable is CEO network centrality, proxied by *Degree*. Heteroskedasticity-robust t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Detailed definitions of each variable are provided in Appendix A.

	Post 12-Month		Post 24-Month		Post 36-Month	
	<i>Crash</i>	<i>Crash_3.2</i>	<i>Crash</i>	<i>Crash_3.2</i>	<i>Crash</i>	<i>Crash_3.2</i>
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Degree</i>	0.152*** (2.775)	0.180*** (3.459)	0.116* (1.889)	0.182*** (3.458)	0.111* (1.778)	0.162*** (3.103)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
SEO Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
No. of Obs.	2,644	2,644	2,644	2,644	2,644	2,644
Pseudo R ²	0.054	0.059	0.062	0.056	0.081	0.058

Table 11**CEO network centrality and post-SEO operating performance**

This table reports the estimation results of cross-sectional OLS models examining the relationship between CEO network centrality and post-SEO operating performance. The dependent variables are industry-adjusted post-SEO operating performance measures, *ADJ_CF* and *ADJ_ROA*, measured over the 36-month post-SEO period. The independent variable is CEO network centrality, proxied by *Degree*. Heteroskedasticity-robust t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Detailed definitions of each variable are provided in Appendix A.

	Post 12-Month		Post 24-Month		Post 36-Month	
	<i>ADJ_CF</i>	<i>ADJ_ROA</i>	<i>ADJ_CF</i>	<i>ADJ_ROA</i>	<i>ADJ_CF</i>	<i>ADJ_ROA</i>
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Degree</i>	-0.010*	-0.010*	-0.011*	-0.011*	-0.018**	-0.018**
	(-1.761)	(-1.767)	(-1.786)	(-1.788)	(-2.442)	(-2.450)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
SEO Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
No. of Obs.	1,971	1,971	1,703	1,703	1,589	1,589
R ²	0.458	0.457	0.442	0.442	0.462	0.461

Table 12
Alternative explanation – CEO power

This table examines whether CEO power explains the baseline probit results. The dependent variables are $SEO_{t \rightarrow t+1}$ and $SEO_{i,t}$. The variables of interest are the interaction terms between *Degree* and CEO power measures (*CEO_DUA* and *CEO_TENURE*). Heteroskedasticity-robust t-statistics are reported in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Detailed definitions of each variable are provided in Appendix A.

	$SEO_{t \rightarrow t+1}$	$SEO_{i,t}$	$SEO_{t \rightarrow t+1}$	$SEO_{i,t}$
	(1)	(2)	(3)	(4)
<i>Degree</i>	0.096*** (4.845)	0.072*** (4.573)	0.072*** (3.295)	0.051*** (3.179)
<i>CEO_DUA</i>	0.064 (1.323)	0.044 (1.241)		
<i>Degree</i> × <i>CEO_DUA</i>	-0.037 (-1.098)	-0.027 (-1.054)		
<i>CEO_TENURE</i>			-0.007** (-2.1229)	-0.007*** (-2.878)
<i>Degree</i> × <i>CEO_TENURE</i>			0.004 (1.266)	0.003 (1.632)
Firm Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
No. of Obs.	375,239	375,239	357,137	357,137
Pseudo R ²	0.109	0.072	0.107	0.070

Online Appendix
for
**The “Dark” Side of CEO Network Centrality: Evidence
from Seasoned Equity Offerings**

Online Appendix A. Summary Statistics for The SEO Sample

Online Appendix B. Correlation Matrix

Online Appendix C. Growth Opportunities Channel Test

Online Appendix D. Investor Sentiment Channel Test

Online Appendix A. Summary Statistics for The SEO Sample

Table OA.1

Summary statistics

This table presents summary statistics for the SEO sample. For each variable, we report the number of observations (No. of Obs.), the mean, standard deviation (Std. Dev.), the 25th percentile, median, and the 75th percentile. Detailed definitions of each variable are provided in Appendix A.

	No. of Obs.	Mean	Std. Dev.	p25	Median	p75
<i>Degree</i>	2,797	210.000	381.000	28.000	64.000	183.000
<i>Size</i>	2,797	5.844	2.549	3.711	5.442	7.788
<i>Cash</i>	2,797	0.330	0.302	0.066	0.211	0.587
<i>MB</i>	2,797	5.134	7.625	1.475	2.741	5.323
<i>Lev</i>	2,797	0.482	0.237	0.291	0.480	0.655
<i>Tangibility</i>	2,797	0.216	0.237	0.047	0.110	0.315
<i>Illiquidity</i>	2,797	3.680	18.85	0.009	0.139	1.484
<i>SG</i>	2,797	0.897	2.635	-0.106	0.168	0.730
<i>IVOL</i>	2,797	0.186	0.092	0.115	0.178	0.244

Online Appendix B. Correlation Matrix

Table OA.2
Correlations

This table reports the Pearson correlation coefficients between variables. **, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. Detailed definitions of each variable are provided in Appendix A.

Panel A: Full Sample										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
(1) <i>Degree</i>	1.000									
(2) <i>Size</i>	0.423***	1.000								
(3) <i>Cash</i>	-0.016***	-0.372***	1.000							
(4) <i>MB</i>	0.145***	0.041***	0.167***	1.000						
(5) <i>Lev</i>	0.190***	0.418***	-0.391***	0.332***	1.000					
(6) <i>Tangibility</i>	-0.075***	0.188***	-0.383***	-0.080***	0.184***	1.000				
(7) <i>Illiquidity</i>	-0.059***	-0.206***	-0.010***	-0.043***	-0.025***	-0.011***	1.000			
(8) <i>SG</i>	-0.028***	-0.075***	0.147***	0.097***	-0.037***	-0.015***	-0.012***	1.000		
(9) <i>IVOL</i>	-0.203***	-0.594***	0.386***	0.009***	-0.178***	-0.111***	0.141***	0.177***	1.000	
Panel B: SEO Sample										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10) (11)
(1) <i>Degree</i>	1.000									
(2) <i>Size</i>	0.529***	1.000								
(3) <i>Cash</i>	-0.115***	-0.454***	1.000							
(4) <i>MB</i>	-0.001	-0.067***	0.132***	1.000						
(5) <i>Lev</i>	0.162***	0.347***	-0.376***	0.382***	1.000					
(6) <i>Tangibility</i>	-0.021	0.296***	-0.465***	-0.080***	0.161***	1.000				
(7) <i>Illiquidity</i>	-0.075***	-0.212***	-0.021	-0.049***	-0.047**	-0.013	1.000			

(8) <i>SG</i>	-0.065***	-0.075***	0.068***	0.041**	-0.067***	0.017	-0.014	1.000			
(9) <i>IVOL</i>	-0.341***	-0.679***	0.411***	0.033*	-0.248***	-0.153***	0.149***	0.127***	1.000		
(10) <i>RUNUP</i>	-0.024	-0.027	0.053***	0.013	-0.005	-0.019	-0.046**	-0.011	0.071***	1.000	
(11) <i>Ln(Proceeds)</i>	0.340***	0.684***	-0.194***	0.035*	0.221***	0.125***	-0.232***	-0.022	-0.484***	0.031	1.000

Online Appendix C. Growth Opportunities Channel Test

Table OA.3

CEO network centrality and growth opportunities

This table presents the channel test results based on firm growth opportunities. We measure firm growth opportunities using R&D intensity (*RD*) and unexercised growth options (*GO*) (Trigeorgis and Lambertides, 2014). The dependent variables are *RD* and *GO*, respectively. Heteroskedasticity-robust t-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	<i>RD</i>	<i>GO</i>
	(1)	(2)
<i>Degree</i>	2.351 (1.204)	-0.039 (-0.440)
Firm Controls	Yes	Yes
SEO Controls	Yes	Yes
Year FE	Yes	Yes
Industry FE	Yes	Yes
No. of Obs.	2,692	2,794
R ²	0.030	0.021

Online Appendix D. Investor Sentiment Channel Test

Table OA.4

CEO network centrality and investor sentiment

This table presents the channel test results based on investment sentiment. We measure investor sentiment using *SENT_BW* (Baker and Wurgle, 2006) and *SENT_PLS* (Huang et al., 2015). The dependent variables are *SENT_BW* and *SENT_PLS*, respectively. Heteroskedasticity-robust t-statistics are reported in parentheses. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	<i>SENT_BW</i>	<i>SENT_PLS</i>
	(1)	(2)
<i>Degree</i>	0.008* (1.902)	0.010* (1.851)
Firm Controls	Yes	Yes
SEO Controls	Yes	Yes
Year FE	Yes	Yes
Industry FE	Yes	Yes
No. of Obs.	2,381	2,381
R ²	0.208	0.284

Reference

- Baker, M., & Wurgler, J. (2006). 'Investor sentiment and the cross-section of stock returns', *The Journal of Finance*, **61**(4), pp. 1645-1680.
- Huang, D., Jiang, F., Tu, J., & Zhou, G. (2015). 'Investor sentiment aligned: A powerful predictor of stock returns', *The Review of Financial Studies*, **28**(3), pp. 791-837.
- Trigeorgis, L., & Lambertides, N. (2014). 'The role of growth options in explaining stock returns', *Journal of Financial and Quantitative Analysis*, **49**(3), pp. 749-771.