Insider CEO-led firms, managerial ability, and capital constraints

Short title

CEO, managerial ability and capital constraints

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Abstract

In this study, I provide an attempt to relate insider CEO, and managerial ability to capital constraints. I draw on disruption and adaptation perspectives of CEO succession and argue that insider and outsider CEOs possess dissimilar knowledge and experience, which would lead to variations in their effect on firm's capital constraints. I test the hypotheses by using a dataset that consists of 2554 firm-year observations of 215 UK FTSE 350 firms over a 12-year period (2010-2021). My results show that capital constraints increased in firm led by insider CEOs relative to firms led by outsider CEOs. High managerial ability reduced capital constraints, and the effect of managerial ability on capital constraint is positive for insider CEO led firms. My main inference is robust to alternative measures of financial constraints, alternative model specifications, and several approaches that control for potential endogeneity. Additional analyses show that insider CEO-led firms in potential default risk have increased access to finance. I discuss the implications on theory, managerial practice and policy decision-making.

1.   Introduction

Capital constraints limits firm competitive ability (Almeida et al., 2004; Campello, 2003; Chevalier and Scharfstein, 1996; Froot et al., 1993), and increase distress risk (Denis and Sibilkov, 2010; Kaplan and Zingales, 2000; Opler et al., 1999). Although firm's access to finance has increasingly attracted the attention of academics and practitioners in the last few decades, there is little evidence on how capital constraint is impacted by CEO succession and managerial ability. The literature show that proportion of outsiders CEOs of top 500 firms in the Forbes annual survey increased from 15% in 1980 to 33% in 1999 (Murphy and Zabojnik, 2007), and outsiders CEOs represent 43% of CEO changes among S&P1500 firms in 2006 to 2011 (Quigley et al., 2019). However, the effects of increase in appointment of outsider CEOs on firm's financial policies in unclear. In this study, I evaluate whether firms led by an insider CEO faced increased capital constraints, relative to those led by outsider CEO. I further evaluate whether CEO managerial ability moderates the relationship between insider CEO and capital constraints.

I draw on disruption and adaptation perspectives of CEO succession literature (Ballinger and Marcel, 2010; Grusky, 1963; Wiersema and Bantel, 1993) to provide an argument that insider and outsider CEOs possess dissimilar knowledge and experience (Barney et al., 2001; Coff, 2002; Hitt et al., 2001; Wang and Barney, 2006), which could lead to variations in their effect on capital constraints. I further argue that managerial ability would mitigate information asymmetry between firm and investors. CEO ability would enable an insider CEO to effectively certify the firm value leading to reduce information asymmetric between the firm and investors (Chemmanur et al., 2009).

To explore the cross-sectional context of my sample, I identify financial flexibility and default risk as two contingency factors that determine the direction of relationship between insider CEO, managerial ability and capital constraints. Financial flexibility refers to a firm's ability to access finance at a low cost and respond to unexpected changes in the firm's cash flows or respond to investment opportunities in a timely manner (Denis, 2011). I argue that high constraints firms have limited financial flexibility, and insider CEO would leverage on firm specific experience and network to reduce capital constraints. Furthermore, the literature show that 52% of firms with top management turnover are either in default on their debt or are bankrupt (Gilson, 1989; Ofek, 1993), and boards are prone to replacing managers following an increase in a firm's probability of default (Ting, 2011). I argue that insider CEO might be able

to leverage on existing relationship with investors to gain increase access to finance for firms in default risks.

Using a dataset that consists of 2554 firm-year observations of 215 UK FTSE 350 firms over a 12-year period (2010-2021), I measure of capital constraint by the Hadlock & Pierce (2010) SA index. I found that insider CEO led firms faced increased capital constraints relative to outsider CEO led firms. High CEO managerial ability significantly reduced capital constraints, suggesting that high-ability CEOs draw on their reputation for efficient use of firm's resources to benefit from increase access to finance. Managerial ability in firms led by insider CEO has a significant positive effect on capital constraints, suggesting that despite domain expertise, investors perceived insider CEO as firm specific additional risks due to the need for investors to share the firm cash flow between the insiders CEO as the organisational key talent (Eisfeldt and Papanikolaou, 2013). This main inference is robust to alternative proxies for capital constraints, alternative samples, alternative model specifications, and several approaches to control for endogeneity.

Next, I evaluate the underlying channels that explain how insider CEOs and managerial ability affects capital constraint by focusing on both the demand and supply sides of capital. I use firms' financial flexibility to assess supply side of capital, by drawing on the literature that show that financial constrained firms are normally associated with lower average stock returns (Lamont et al., 2001), while unconstrained firms normally outperform financial constrained firms (Balafas and Kostakis, 2017; Haider et al., 2018). My results show that investors are unwilling to increase funds to high-constrained insider CEO led firms. This could be due to the risk that insider CEO will continue with the firm's old policies that led to poor performance.

I further use firms' default risks to assess demand side of capital, by arguing that firm financial condition dictates the demand for external funding. My result show reduced capital constraints in default risk firms led by insider CEO. Consistent with prior literature the result indicate that insider CEO has built relationship with fund providers over time enabling the insider CEO have increase access to finance. For example, Hoshi et al. (1990) find that Japanese firms with close ties to their banks are less likely to be liquidity constrained in their investments than firms that do not have such ties. Conditional on its experience with the borrower, the lender now expects loans to be less risky, leading to a reduce expected cost of lending and increase its willingness to provide funds because the insider CEO is deemed trustworthy (Diamond, 1991).

My study make two major contributions to the literature. First, I extend disruption and adaptation perspectives of CEO succession by offering nuanced explanations for the heterogeneity effect following the appointments of insider or outsider CEOs. My results elucidates a unique disadvantage of insider CEOs, by showing that counter to conventional wisdom, insider CEOs face the pitfalls of misfit, leading to increase capital constraints in the appointing firms. Second, previous studies do not provide information that will help investors or debt holders understand how the relationship between CEO succession (Quigley and Hambrick, 2012), and capital constraints are shaped by financial flexibility and default risks. My result show that insider CEO reduces capital constraints of firms in default risks, suggesting that insider CEO can orchestrate reduction in capital constraints of firms in default risks.

The practical implication of the findings is that appointing insider CEO is detrimental to the firm in terms of increased capital constraints. Fund providers have negative sentiments about a firm when an insider is appointed CEO and are unwilling to provide increase access to capital to the firm. The remainder of this paper is organized as follows. Section 2 discusses theoretical framework. Section 3 discusses prior literature and presents the hypotheses. Section 4 presents the study's data and methodology used in the paper. Section 5 presents the main findings, robustness tests, and additional analyses. Finally, Section 6 concludes the paper.

2. Theoretical framework

CEOs have significant impact on firm strategy and performance outcomes which has increased in recent decades (Hambrick and Quigley, 2014; Quigley and Hambrick, 2015). Empirical literature has studied the effect of CEO succession on firm outcomes by using the lens of disruption and adaptation perspectives. Disruption theorists (Ballinger and Marcel, 2010; Grusky, 1963) posit that succession is associated with significant disturbances within the organization (Boeker, 1992), and that the associated performance gains from CEO succession may not offset the disruption costs associated with succession. Related to the disruption perspective, CEO succession disrupts routines and relationships, increases internal instability, and deteriorates external relationships (Ballinger and Marcel, 2010; Boeker, 1992). CEO succession can bring about managerial turnover, which results in the loss of firm-specific human capital and knowledge, a source of firm value (Greiner et al., 2003).

In addition, the new CEO must learn roles and responsibilities in the position, understand organizational resources and routines, and foster relationships with stakeholders (Karaevli, 2007). The new CEO must also get familiar with new routines and processes, in order to

orchestrate the organization's resource base to meet new objectives. The disruption perspective indicate that there is likelihood of continuity in the firm's "circle of perpetual change and underperformance" due to the limited ability of the new CEO to learn and adapt (Hughes et al., 2010, p.571), especially, if the new CEO fail to solve underlying organizational problems (Sakano and Lewin, 1999). However, a means by which firms can potentially reduce problems related to disruption is by grooming and selecting inside CEO candidates through planned and orderly transitions (Vancil, 1987).

Conversely, the adaptation theorists (Wiersema and Bantel, 1993) argue that CEO succession is an opportunity to realign the firm's strategy and resources with the external environment (Shen and Cho, 2005). The adaptation perspective argues that new CEOs bring novel strategic perspectives and reconfigure resources (Shen and Cho, 2005), that is, new CEOs improve adaptation by aligning internal resources with the external environment. The strategic change initiated by the new CEO may not directly influence short-term performance, but may influence long-term performance. Therefore, positive benefits from adaptation accrue over time as the new CEOs learn and adapt on the job (Hambrick and Fukutomi, 1991). However, others have questioned whether adaptation benefits by the new CEO are contingent on the industry (Miller and Shamsie, 2001) or whether the associated gains in performance decline with increasing tenure of the new CEO (Henderson et al., 2006). Furthermore, the risk associated with adaptation in relation to the prospects of long-term performance gains have led to doubts about the outcome of CEO succession (Hughes et al., 2010). Next, I develop hypothesis based on the CEO succession perspectives on how internal CEO would affect capital constraints.

3.   Hypotheses development

In this section, I first develop hypotheses on the relationship between insider CEO, managerial ability and capital constraints, and then focus on how managerial ability moderate the relationship between insider CEO and capital constraint..

3.1.   Insider CEO-led firms and capital constraints

External CEO successions are generally prescribe as a remedy for firm difficulties (Helmich and Brown, 1972). When drastic changes are required, an external manager appears more promising because she or he are not be bind by old policies and implicit contracts of the firm. An external succession can enrich the company with what it needs most—new perspectives, fresh ideas, and decisive actions. Murphy & Zabojnik (2007) argue that the skills required to being an effective CEO have changed in recent decades as CEOs have become increasingly

focused on external constituencies and less focused on internal operations. The shareholder-rights movement beginning in the late 1980s and the increased ownership of large institutional investors has forced CEOs to lead their companies' investor-relation efforts, communicating directly with shareholders and institutions. The emergence of around-the-clock news organizations requires CEOs, as their companies' top spokesperson, to be experts in communicating with both print and broadcast media. In addition, more than in the past, CEOs of firms relying on capital markets for debt and equity issues must learn to communicate with the capital markets and deal with stock analysts and other external constituencies that affect share prices. These "external relation" skills are largely general and not specific to a given organization, and boards demanding these skills will predictably look outside to fill CEO openings.

Researches have shown that the increasing trend in hiring outsider reflects greater board diligence in monitoring the CEO, and is likely that an external candidate was appoint only after a comprehensive search during which the candidate proved herself or himself superior to other external and internal candidates for the post (Hermalin, 2005; Huson et al., 2001). This suggests that on average firms that recruited from outside got a more skilful CEO than firms that appointed from inside. It may also be argue that firms with generalist CEOs as opposed to specialist CEOs should have a lower cost of external finance. This is because outsiders CEOs can be perceive by fund providers to be able managers, and firms facing more challenging and complex situations, such as restructuring and distress, and capital constraints, may have a greater desire to recruit them. Accordingly, at the centre of such a desire might be the anticipation that outsider CEOs would likely pursue business strategies that might eventually reduce the firm's market risk, leading to lower required rates of return. It also is possible that external CEO would have become integrate into the networks of key stakeholders (including fund providers), and form a coalition with them (Simsek, 2007).

However, proponents of internal successions highlight the importance of continuity. They stress the importance of insiders' greater knowledge of the firm, and their established social networks (Lubatkin et al., 1989). Internal candidates provide smooth transition and stability because they are well acquainted and have participated in developing the existing corporate strategy (Carlson, 1961). Internal successions also promote loyalty, as employees feel more committed when upward mobility to the top rank is afforded. Kotter (1982) argues that internal CEOs have acquire expertise through long tenure with one company (or companies in one industry). Accordingly, internal CEOs have advantage over outsiders for two reasons. First, insider CEOs

are more knowledgeable than outsider CEOs about a firm's specific products, competitors, markets, customers, and employees. This knowledge helps internal CEOs understand a large, complex, and diverse sets of activities and make appropriate decisions. Second, insiders have established social networks—including superiors, subordinates, peers, and others—through which they gain the information and support needed to perform their job. Outsiders must devote a considerable amount of time to establishing such networks.

However, from a psychological ownership perspective, internal CEOs are likely to feel that the firms they lead are ones in which they have invested, and possibly feel as if the company is their own (Pierce et al., 2001). Psychological ownership refers to the feeling of possession of a subject regardless of whether he or she has any real authority or control over that subject. Furthermore, Boeker & Goodstein (1993) show that internal candidates usually seem to have closer relations with the members of the board of directors. Therefore, it is likely that sometimes an internal candidate is selected to office despite the fact that an external succession might be optimal. Some studies also suggest that the firm specific experiences of internal CEOs may increase the degree of overconfidence (Glaser and Weber, 2010), and therefore may promote excessive risk-taking.

I argue that potential agency problem could arise when internal CEOs are appointed because of their close tie with the board, especially when appointment of external candidate would have been optimal. Rational outside credit providers would be worry about misuse of funds, especially in markets where minority shareholders are not well protected (Dyck and Zingales, 2004; Riyanto and Toolsema, 2008). Therefore, firm with internal CEO would have to pay extra cost on financing to cover potential agency costs, which may in turn exacerbate firms' financial conditions (Marcelin and Mathur, 2014). Furthermore, it has been shown that appointment of internal CEO often result in greater variation in firm performance, conservative corporate policy and higher agency costs after the CEO long time in post. These agency costs could make fund providers unwilling to provide increased access fund, leading to increased capital constraints. The discussion lead to the following hypothesis.

Hypothesis 1. *Insider CEO-led firm will have increased capital constraints relative to outsider CEO-led firms.*

3.2. Managerial ability and capital constraints

Previous study show that more able CEOs show a greater capacity and ability to operate in uncertain business environment (Jiraporn et al., 2016), and more able CEOs maintained their

commitment to firm goals. Kim, (2020) show that firms with higher emotional intelligence and cognitive ability managers outperform their counterparts. Better risk management by able managers allows them to grasp new profitable investment opportunities through lower cost of debt and equity financing, particularly during growth phase (Agarwal et al., 2011; Bonsall et al., 2017; Bui et al., 2018; De Franco et al., 2017; Gan, 2019; Lee et al., 2018; Yung and Chen, 2018). Chemmanur & Paeglis (2005) report that management quality not only facilitates the firms to get a higher premium during IPOs but also, helps the firms enhance operating and market performance. They show that firms with quality management use low leverage, pay lower dividends, and have lower information asymmetry. Reduced information asymmetry, in turn, enable the firm gain better access to funds. The implication of the forgoing is that managerial ability will reduce firm's capital constraints. I develop the following hypothesis:

Hypothesis 2. *High managerial ability will be negatively associated with capital constraints*

3.3. Insider CEO and capital constraints: moderating effect of managerial ability

The strategic perspective suggests that managerial ability derives from two main sources: domain expertise and resource expertise. Domain expertise refers to managers' understanding of the industry context and the firm's strategies, products, markets, task environments, and routines (Boeker, 1989; Kor, 2003; Spreitzer et al., 1997). It captures the breadth of knowledge managers accumulate through formal education in a particular field and through 'learning by doing.' Although managers bring explicit knowledge derived through formal education into their firms, they build specific (tacit) knowledge about the firm and industry domain through their experiences and rely on this experience when making decisions about the appropriateness and sequence of actions (Collins et al., 2009; Fondas and Wiersema, 1997; Melone, 1994). Furthermore, as managers accumulate domain expertise, they develop proficiencies and become more effective at aligning firm strategies with the industry context in ways that enhance organizational performance, because they understand better the opportunities to pursue and threats that require a response (Coff, 1999; Holcomb et al., 2009; Mahoney, 1995). Across different firm and industry domains, these skills differ. The more specific the ability embedded in managers, the more likely it is to be imperfectly transferrable to other firms and particularly difficult for rivals to imitate, making it a potent source of superior performance (Hatch and Dyer, 2004). On the other hand, resource expertise manifests through experience with resource management processes (Sirmon et al., 2008). Specifically, resource expertise represents the

ability of managers to select and configure a firm's resource portfolio, bundle resources into distinctive combinations, and deploy them to exploit opportunities in specific contexts.

Eisfeldt & Papanikolaou (2013) show that CEOs are a firm's key talents (human capital) and they symbolise the firm's valuable organization capital. Shareholders of a firm with insider CEO, who are likely to have close ties with the board, can be expose to additional risk, resulting from the need to share the firm's cash flow between the key talent (i.e. the CEO) and shareholders. Shareholders take the residual cash flow from the sharing process, because the slice taken by the key talent depends on the outside options available to the key talent or CEO (human capital). It is likely that an insider CEO is appointed when the firm are doing well, and the shareholder do not want the CEO to depart the firm. Eisfeldt & Papanikolaou (2013) model demonstrate the risk of over-reliant on an organisation key talent. They argue that "shareholders investing in firms with high organization capital are exposed to the risk of key talent leaving the firm" (p.1382). They show that such firms are more likely to list 'loss of key talent' as a risk factor in their 10-K filings.

However, insider's CEOs are more likely to be specialist CEOs, and a specialist CEO's long-term wealth is highly contingent on the performance and longevity of the firm that he or she leads. One implication of this contingency argument is that insiders CEOs may have incentives to invest in higher risk, short-term performance projects that have no positive effect on the firm long-term value, thereby misaligning CEO incentives with those of shareholders. This sort of misalignment is an additional risk to fund provider. Therefore, fund providers would be unwilling to provide increase funding for projects that would not increase the firm long-term value. I proposed that insider CEO-led firms would face increase capital constraints, leading to the following hypothesis.

Hypothesis 3. *Managerial ability will have significant positive effect on capital constraints in firms led by insider CEO.*

4.   Data and methodology

4.1.   Data and sample

I collected financial and governance data from the Bloomberg database. I started with all UK FTSE 350 listed companies across all sectors and removed financial companies, mainly insurance companies and banks, as they have different regulatory frameworks and reporting conventions compared to other companies. I removed all observations with missing annual data. The final sample is an unbalanced panel dataset comprising 2554 firm-year observations from

215 firms over a 12-year period (2010–2021). The sample covers a wide range of industries and consists of companies that represent a significant proportion of the UK economy. Specifically, the sample takes into account all-important economic sectors base on the U.K. Standard Industrial Classifications of Economic Activities 2007 (Office for National Statistics, 2007). These sectors include manufacturing, durable and non-durable goods, transportation, electronics, computers and electronic products manufacturing, chemical manufacturing, food manufacturing, utilities, wholesale trade, durable goods, plastic and rubber product manufacturing, mining, other manufacturing, and professional, scientific and technical services, among others. Therefore, the results would be applicable to a variety of important industries (Polit & Beck, 2010).

4.2. Variables

4.2.1. Capital constraint.

Demirgüç-Kunt & Maksimovic (1998) firm growth model indicates firm's total assets as the main determinant of external fund requirement. I posit that total assets is linked to capital constraints, as large size would indicate firm that require higher amount of external fund requirement. Furthermore, Hadlock & Pierce (2010) argue that firm's size and age are the main determinants of capital constraint. Therefore, I use Size-Age index (Hadlock & Pierce, 2010) as a proxy for financial constraints. The SA index measure of financial constraints is calculate as:

$$SA\ INDEX_{it} = -0.737 * SIZE_{it} + 0.043 * \left(SIZE_{it}^2\right) - 0.040 * AGE_{it}$$

$$SIZE_{it} = LNTOTALASSETS_{it}; AGE_{it} = Number\ of\ years\ the\ firm\ is\ listed$$

4.2.2. Independent variables

Insider CEO-led firms: Insider CEO was coded "1" if the CEO was appointed from within the firm (Graffin et al., 2011), zero, otherwise.

Managerial ability: I follow the two-step methodology of (Demerjian et al., 2012; Demerjian et al., 2013) to measure managerial ability. They attribute residual from the estimation to the ability of the management team, which they called Managerial Ability Score (MA-Score). I decile rank the residual of the MA- score by year, and firms in the top three deciles are group of companies considered to have high managerial ability, companies below the top three deciles are group of companies considered to have low managerial ability.

4.2.3. Control variables.

I included a dummy variable "1" for *Female CEO* when CEO is a female, zero, otherwise. Cross-country studies have shown that women are less likely to get financing from a formal

financial institution or are charged higher interest rate than men (Muravyev et al., 2009). I included the ratio of the number of independent directors on the board to total board size. *Independent Directors* are those who are neither inside nor gray directors (Brickley et al., 1994; Byrd and Hickman, 1992; Weisbach, 1988). I included a dummy variable "1" when the *Former CEO* is retain on Board. Former CEOs are often retain on the Board of Directors, to serve for example, as Chairman of the Executive Committee. Retention of former CEO on board may seek to utilize the CEOs valuable knowledge on the company and business, or it may reflect significant share holdings by the CEO and their family. It seems reasonable to assume that firms that retain the former manager in an official position signal their preferences for some continuity. When the former CEO stays close by, the range of discretion afforded to the new CEO is somewhat moderated (Friedman & Singh, 1989, p.727), which may deters some prospective external successors. I included *CEO Tenure*, measure as the natural logarithm value of number of years the CEO has been in office in the firm, at the end of each fiscal year. I included *Female Executives,* measure as the proportion of Female in the firm Top Management Team for each fiscal year. I include *CEO Compensation*, measure as the natural logarithm value of CEO total compensation. Compensation may be a reflection of CEO's ability (Murphy and Zabojnik, 2007). I included *Tobin Q* as a proxy for investment opportunity. I included *Financial Slack,* measure as the ratio of cash and cash equivalents to total assets. CEOs may prefer to use internal resources in investments because it would require a lower level of information reporting (Myers, 1984; Myers and Majluf, 1984). Financial slack may give managers more flexibility to operate their companies. I included two proxies for *Firm Risk*. First, the standard deviation of annual stock market return for the prior five years. Second, the standard deviation of annual operating return on assets for the prior five years. I included *Leverage,* measure as the ratio of book debt to book value of total assets. I included *R&D Expenses*, measure as Research and development expenses divided by Net Sales. I included Capital expenditure (*CAPEX*) measure as Capital Expenditure divided by Total Assets minus Cash and Cash Equivalents. I included *Employee Intensity*, measure as the ratio of employee wages and salary to revenue, because employees payment contributes to firm's financial constraints (Aterido et al., 2013). I included Industry fixed-effects and year fixed-effects to capture heterogeneity at the industry level, and to account for unobservable macro-economic effects, general events, or trends in the data. Appendix A presents the variable definitions.

4.3. Econometric model.

I use firm-specific fixed effects regressions with heteroskedasticity-adjusted standard errors clustered at the industry and year levels. I perform the Hausman test, which suggests that a

fixed-effects model is appropriate for the unbalanced panel data set. I develop Equation 1 to test Hypotheses 1 to 5.

$FINC_{i,t}$

$$= \gamma_1 + \gamma_2 Int\_CEO_{i,t} + \gamma_3 MA_{i,t} + \gamma_4 (Int\_CEO_{i,t} * MA_{i,t}) + \sum Controls + FirmFE_i$$
$$+ YearFE_i + \varepsilon_{it} ....(1)$$

In these models, capital constraints of firm i in year t are use as dependent variable. I used dummy variables for insider CEO-led firms. The estimation includes company-specific control variables and the error term ε.

5. Empirical Results

5.1. Descriptive statistics

I present the descriptive statistics of the dependent and independent variables in Table 1.

Insert Table 1 about here

The mean value SA index for the period 2010 to 2021 was 3.158, with a standard deviation of 2.1. The high mean value of the SA index indicates that FTSE 350 companies' are big size companies and most of these companies have been listed on the Stock Exchange for a very long time. The standard deviation of the SA index is greater than one, indicating that there is a significant variation in the level of financial constraints among the FTSE 350 companies. The mean value of CEO appointed from outside the firm for the period 2010 to 2021 was 0.377, with a standard deviation of 0.485. This indicate that 37.7% of the FTSE 350 companies appointed their CEO from outside the firm in the years 2010 to 2021. On the other hand, the mean value of CEO appointed from within the firm in the years 2010 to 2021 was 0.468, with a standard deviation of 0.499. This indicate that 46.8% of the FTSE 350 companies appointed their CEO from within the firm in the years 2010 to 2021. The mean value of FTSE 350 CEO appointed from within the FTSE 350 firms are higher than the mean value of CEO appointed from outside the firm. The results do not support the findings in which report that 43% of CEO changes among the US S&P1500 firms are from 2006 to 2011 are from outside the firm. Difference in time and firm contextual factors might account for the shift in pattern of CEO succession among the UK FTSE 350 firms compared to those of the US companies. The mean value of firm with high managerial ability between 2010 and 2021 was 0.199, with a standard deviation of 0.399. This indicate that 19.9% of the FTSE 350 companies have high managerial ability between the years 2010 and 2021. The low proportion of firms with high managerial

ability suggests that FTSE 350 firms with high level of efficiency and factor productivity between 2010 and 2021 was very low.

Table 1 also shows the Tolerance values, Variance Inflation Factor (VIF), Eigen Value and Condition Index. These statistics are used for detecting multicollinearity among the independent variables used in the analysis. All the VIF in Table 1 are less than 5, suggesting that there is no multicollinearity problem among the predictor variables (Belsley, 1991). Eigenvalue stands for the variance of the linear combination of the variables. Sometimes it is difficult to interpret the eigenvalue; therefore, conditional index (CI) is use as the alternative. The condition index (CI) is a function of eigenvalues and is used to measure the overall multicollinearity of the variables. The value of CI is always greater than one, so a higher value of CI indicates the multicollinearity. All the CI in Table 1 are less than 5, suggesting that there is no multicollinearity problem among the predictor variables (Knoke et al., 2002; Young, 2018).

Panel B of Table 1also present the result of the independent group t-test, designed to compare means of the variable between outsider CEO-led firms and insider CEO-led firms. The t-test F statistic measures the ratio of larger sample variances to smaller sample variances for the two groups of CEO led firms. The F statistic for SA index is 1.66 with a probability less than 0.0001, suggesting that there is evidence that the variances for outsider CEO led firms and insider CEO led firms are different. The t-test statistic for the difference in mean (mean of SA index for external CEO led firms minus mean of SA index for internal CEO led firms) is -4.26, with a probability of less than 0.0001. This result indicate that the mean value of SA index for internal CEO led firms are significantly larger than the mean value of SA index for external CEO led firms. The result suggest that bigger size and much older firms appoint internal CEO led firms while smaller size and younger firms appoint more of external CEO led firms. One possible reasons for this result could be attributed to succession planning. Bigger size firms and older firms might have developed a robust succession plan to enable an internal candidate succeed an outgoing CEO. The F statistic for high managerial ability score is 1.11 with a probability less than 0.1, suggesting that there is evidence that the variances for outsider CEO led firms and insider CEO led firms are different. However, the t-test statistic for the difference in mean is not significant. This result indicate that the mean value of high managerial ability score for internal CEO led firms are not significantly larger than the mean value of high managerial ability score for external CEO led firms.

Table 2 presents the results of Pearson's correlation coefficients, the third statistical measure of multicollinearity used in this study.

Insert Table 2 about here

Pearson's correlation coefficient helps to check the collinearity of independent variables. The Spearman correlation coefficients show that internal CEO has positive and significant effect on capital constraints, this provides initial support for hypothesis one.

5.2. Main Findings

Table 3 shows the results of a multivariate analysis while controlling for other variables that could affect capital constrains.

Insert Table 3 about here

In Model 1 (M1), the coefficient of internal CEO led firms are positive (CEO INT = 0.418) and significant at 1%. This result supports Hypothesis 1 and suggests that firm that are led by CEOs appointed from within the firm have a significant effect of increasing capital constraints relative to firm that are led by CEOs appointed from outside the firm. In Model 2 (M2) the coefficient of high managerial ability is negative (HIGH MAB = -0.217) and significant at 1%. This result supports hypothesis 2 and indicate that high managerial ability reduces capital constraints.

Model 3 included internal CEO, high managerial ability and the interaction of internal CEO and managerial ability in the model estimation. The coefficient of internal CEO is positive and significant as shown in earlier models, and the coefficient of high managerial ability is negative and significant as shown in earlier models. The coefficient of the interaction of internal CEO and managerial ability is positive (MAB*CEO INT = 0.354) and significant at 5%. This result supports Hypothesis 3 and indicates that managerial ability has a significant positive effect on capital constraints in firms led by insider CEO. The result implies that managerial ability in firm led by CEOs appointed from within the firm are low and leading to a significantly higher capital constraints.

5.3. Robustness Checks

To address concerns about potential endogeneity and reverse causality between insider vs outsider CEO-led firms and capital constraints, I estimate Equation 1 using a dynamic two-stage system of generalized method of moments (GMM) panel data estimator (Arellano and Bond, 1991; Blundell and Bond, 1998), with finite sampling correction and heteroscedasticity-

corrected standard errors (Windmeijer, 2005). I added industry dummies in all models to control for industry fixed effects. I included the first lag of capital constraints the as an instruments variable in the dynamic two-stage system of generalized method of moments (GMM) regression of financial constraints, in addition, I use all independent variables as instruments. I tested the validity of the instruments using the Hansen J statistic of over-identifying restrictions and the Arellano-Bond test for the absence of serial autocorrelation. The estimation results (not reported) reveal no significant difference from the reported results.

5.4. Extended analysis

I now move on to investigate contextual factors that shape the relationship between insiders versus outsider CEO and managerial ability and capital constraints.

5.4.1. Supply side of capital

I focus on firm financial flexibility, which refers to a firm's ability to access financing at a low cost and respond to unexpected changes in the firm's cash flows or investment opportunities in a timely manner (Denis, 2011). Unconstrained firms significantly outperform than financially constrained firms (Balafas and Kostakis, 2017; Haider et al., 2018), and constrained firms are associated with lower average stock returns (Lamont et al., 2001) and lower seasoned equity offerings announcement (Kurt, 2018).

I argue that firms that are in high financial constraints category has limited financial flexibility. Since internal CEO had been in the firm prior to the firm finding itself in high capital constraint category, insider CEO would exacerbate capital constraints for firms in the high constraints category. Consistent with Linck et al. (2013), I create decile ranks for the SA index for each year to make the score more comparable across time and to mitigate the influence of extreme observations. Firms in the bottom three deciles of the SA index in each year are consider Low financial constrained and I assigned a dummy variable 1 to such firms. Firms in the top three deciles of the SA index in each year are consider high financial constrained and I assigned a dummy variable 1 to such firms. The result is present in Table 4.

Insert Table 4 about here

In Model 1 (M1), the coefficient of internal CEO led firms are positive (CEO INT = 0.274) and statistically significant at 1% for high constraints firms. In Model 2, (M2), the coefficient of internal CEO led firms are negative (CEO INT = -0.326) and statistically significant at 1% for low constraints firms. These results are consistent with the results in Table 3 and indicate that CEO appointed from inside the firm increases capital constraint in high constraints firms and

reduce low constraint in the least constraints firms. In Model 3 (M3), the coefficient of high managerial ability is negative (HIGH MAB = -0.405) and statistically significant at 1% for high constraints firms. In Model 4 (M4), the coefficient of high managerial ability is positive (HIGH MAB = 0.266) and statistically significant at 1% for low constraints firms. Again, the results are consistent with the results in Table 3 and indicate that high managerial ability reduce capital constraint in high constraints firms and increase the low constraint in the least constraints firms.

5.4.2. Demand side of capital

Gilson (1989) investigated top management turnover in financially distressed firms and found that 52% of firms with top management turnover in the investigative year either are in default on their debt or are bankrupt. Ofek (1993) also reports similar results. I argue that investors would not be willing to increase funding to firm in default risk irrespective of whether in successor CEO is from outside or within the firm. Several studies have used the Z-score to compute the default risk of firms. I therefore use the Altman et al. (1977) Z-score to measure default risk. I categorised firms by Altman Z score of less than 1.80 as default risk firms, those above this threshold are non-default risk firms. I evaluate the effect of internal vs external CEO on capital constraints in default risk and non-default risk firms. The result is present in Table 5.

Insert Table 5 about here

In Model 1 (M1), the coefficient of internal CEO led firms is negative (CEO INT = -0.0530) but not statistically significant for firms with Altman Z score of less than 1.8 (default risk firms). In Model 2, (M2), the coefficient of internal CEO led firms are positive (CEO INT = 0.373) and statistically significant at 1% for firms with Altman Z score of higher than 1.8 (no default risk firms). These results indicate that even when a firm is not in default risk condition, a firm face significant increase in capital constraints when the CEO is appointed from within the firms. Although not statistically significant, the negative relationship between CEO appointed from within the firm and capital constraints for firms that are in default risk, suggest that CEO appointed from within the firm can orchestrate strategies to reduce capital constraints of a firm in default risk condition. In both Model 3 (M3), and Model 4 (M4) the coefficient of high managerial ability are negative but not statistically significant. The results indicate that whether or not a firm is in default risk condition, high managerial ability reduces the firm capital constraints.

6. Discussion

6.1. Discussion of the empirical result.

I investigate the relationship between insider CEO, managerial ability and capital constraints. I draw on the disruption and adaptation perspectives of CEO succession literature, and advance an argument that insider and outsider CEOs possess dissimilar knowledge resources in terms of their experience and knowledge bases within and outside a firm, which would lead to variations in their effect on capital constraints. I further identify financial flexibility and default risk and two contextual factors that shape the relationship between insider CEO, managerial ability and capital constraints. The result of the empirical analysis are threefold. First, the evidence show a strong support for H1, indicating that insider CEO led firm have a significant higher capital constraints relative to outsider CEO led firms. The disruption and adaptation perspectives of CEO succession literature (Ballinger and Marcel, 2010; Grusky, 1963; Wiersema and Bantel, 1993), provides a solid theoretical rationale for why a positive relationship exists between CEO appointed from within the firm and capital constraints in the UK FTSE 350 firms. Investors have negative sentiments and reduce financing to firms led be an insider CEOs because of the possibility of increased agency risks.

Second, I find a strong support for support for H2, indicating that high managerial ability reduces capital constraints. The result implies that high-ability managers leverage on their reputation for efficient use of firm's resources to have increase access to finance. This result is consistent with prior literature that show that management quality enables a firms get a higher premium during IPOs and also, enhance firm operating and market performance, and lower information asymmetry (Chemmanur and Paeglis, 2005). High ability manager are able to certify the firm value more effectively to reduce information asymmetric between the firm and investors (Chemmanur et al., 2009), leading to a reduction in capital constraints.

Third, I find a strong support for Hypothesis 3, indicating that managerial ability has a significant positive effect on the relationship between CEO appointed from within the firms and capital constraints. The result indicate that, although CEO appointed from within the firm may have domain expertise, if the CEO is appointed after a rigorous selection process, the CEO appointed from within the firm may represent the firm's key talents (human capital) and they symbolise the firm's valuable organization capital (Eisfeldt and Papanikolaou, 2013).

To explore the cross-sectional context of my sample, I identify financial flexibility (on the supply side of capital), and default risk (on the demand side of capital), as two contingency

factors that determine the direction of relationship between insider CEO, managerial ability and capital constraints. My result show that the relationship between insider CEO and capital constraint increase in high constraints firms, but reduce in low constraint firms. The result support the view that unconstrained firms significantly outperform constrained firms (Balafas and Kostakis, 2017; Haider et al., 2018). Investors are unwilling to increase funds to firms led by CEO appointed from within the firm, when the firms are in the high constraints category possibly due to that risk that the internal CEO will continue with the firm's old policies that led to poor performance.

On the demand side of capital, I show that insider CEO has a negative effect on capital constraints of firm in default risk condition, suggesting that insider CEO can orchestrate strategies to reduce capital constraints of a firm in default risk condition. One explanation for this result is that insider CEO has built with fund providers over time enabling the firm in default risk to gain increased access to finance. For example, Hoshi et al. (1990) find that Japanese firms with close ties to their banks are less likely to be liquidity constrained in their investments than firms that do not have such ties. Conditional on its experience with the borrower, the lender now expects loans to be less risky, leading to a reduce expected cost of lending and increase its willingness to provide funds because the insider CEO is deemed trustworthy (Diamond, 1991).

6.2. Implications for theory

My study contribute to the disruption and adaptation perspectives of CEO succession literature (Ballinger and Marcel, 2010; Grusky, 1963; Wiersema and Bantel, 1993). First, I contribute to an evolving literature by showing that although insider CEOs are in position to better align firm strategies to existing firm capabilities, fund providers are unwilling to provide increase funding to insider CEO-led firms. Fund providers might a low assessment of insider's CEO ability, leading to their unwillingness to increase funding to the insider CEO-firm. It is also possible that insider CEO was appointed because of close ties with the board. Shareholders of insider CEO-firms can be expose to additional risk, resulting from the need to share the firm's cash flow between key talents (i.e. the CEO) and shareholders. This additional risk arise from the risk of key talent leaving the firm (Eisfeldt and Papanikolaou, 2013).

Second, I contribute to the evolving literature that moves beyond treating effect of CEO succession in isolation from other key aspects of the firm contexts by integrating insider CEOs with managerial ability. Managerial ability has a significant positive effect on capital

constraints in insider CEO-led firms. Possible close ties between insider CEO and the board may lead to loose board monitoring and control, exposing investors to additional risks of the CEO misappropriation of the firm's resources. Insider CEOs may have incentives to invest in higher risk projects, focus on short-term projects that have no positive effect on the firm long-term value, thereby misaligning CEO incentives with those of shareholders. These additional risks make fund providers unwilling to increase fund to the firm. The coefficient of the interaction of managerial ability and insider CEO is positive suggesting that managerial ability in insiders CEO led firms are low, leading to increase in capital constraints. A generally low managerial ability of insiders CEO may limit the effective certification of the firm value to reduce information asymmetric between the firm and investors (Chemmanur et al., 2009), leading increased capital constraints.

6.3.   Implications for practice

The study has several implications for managerial practice. First, I substantiate that the baseline effects of insider CEO on capital constraints. My findings suggest that when organisations are facing financial constraints situation and a need arise to appoint a successor CEO, organizations should be more attentive to the effects of disruption or adaptation orchestrated by the new CEO and that external vs internal CEO works in opposite direction in relation to the firm capital constraints. While external CEO reduce the organisation capital constraint, internal CEO increase the organisation capital constraint. The result would allow the board to develop more targeted approach to CEO successions.

The study also has implications for policy makers. For example, regulators and policy makers are interested in increasing job availability in the labour market. If organisations are financially constraints, they may have to forego profitable investment projects, and thus unable to generate employment. However, access to finance is condition on the ability of the organisation to efficiently utilised existing resources at its disposal. Conceivably, low organisational productivity or low efficiency in the use of existing organisation resources could be a barrier to increasing access to finance. It might be prudent for regulators and policy makers to focus on organisation productivity or efficiency in their use of existing organisation resources, and formulate policies that could help organisation improve their productivity and efficiency rather than solely concentrating on access to finance.

6.4. Limitations and future research

The findings are subject to two limitations which future research should address. First, the study use the SA index measure of financial constraints and the result may be significantly influence by the sample firm size and age, the result may therefore be different for sample of firms with significant small sizes of younger age. In addition, Myers & Majluf (1984) propose a pecking order model, according to which, in a world characterized by imperfect capital markets, firms first use all retained earnings to finance themselves, then debt, and then equity as a last resort. The option to rely on internally generated resources may not necessarily attributable to difficult access to external sources of capital. It could be due to the decision makers' interests in avoiding publishing data that may increase the monitoring and control of their management. Consequently, the relationship between insider CEO and capital constraints may be picking up the conflicts of interest between the CEO and the shareholders as well as the asymmetry of information between the CEO and investors (shareholders or creditors). Future research should address these issues by focusing on other potential measures of capital constraints and control for the potential information asymmetry between the CEO and investors.

6.5. Conclusion

In this study, I advance the line of inquiry on the role of insider CEO and managerial ability on capital constraint. I conceptualize the distinct effects that insider CEO and managerial ability have on capital constraints. My result show that appointment of insider CEO successor could be detrimental to the firm capital constraint while managerial ability help to reduce capital constraint. The results show that insider CEO not only increases capital constraints but also, the financial condition of the firm influence the direction of the relationship between insider CEO and capital constraint.

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Table 1. Descriptive statistics   OLS

Variable	N	Mean	Std Dev	P75	P25	Tolerance	VIF	Eigenvalue	Condition Index
SA Index	2507	3.158	2.100	4.368	1.843				
CEO External	3000	0.377	0.485	1.000	0.000	0.923	1.084	1.820	1.000
CEO Internal	3000	0.468	0.499	1.000	0.000				
High MAB	2247	0.199	0.399	0.000	0.000	0.965	1.036	1.708	1.032
Pers Intensity	2400	0.312	2.491	0.301	0.110	0.982	1.018	1.343	1.164
Lag Fin Slack	2640	-0.084	1.245	0.628	-0.692	0.937	1.067	1.283	1.191
Fmr CEO Brd	3000	0.096	0.295	0.000	0.000	0.902	1.108	1.154	1.256
CEO Dual	3000	0.020	0.140	0.000	0.000	0.944	1.059	1.095	1.289
CEO Tenure	2945	4.962	5.474	7.250	0.833	0.878	1.139	1.020	1.335
Pct Ind Dir	2567	62.757	13.799	72.727	55.556	0.753	1.327	0.982	1.362
CEO Comp	2450	14.453	0.855	14.980	13.891	0.824	1.214	0.938	1.393
Stdev Stock Ret	2303	22.800	48.455	24.641	4.044	0.972	1.029	0.910	1.414
Stdev ROA	2985	4.525	5.670	5.543	1.516	0.702	1.424	0.905	1.418
Leverage	2594	0.381	0.502	0.540	0.153	0.918	1.089	0.833	1.478
PCT Fem Exec	2554	10.896	15.033	20.000	0.000	0.762	1.312	0.781	1.527
CEO Female	3000	0.040	0.196	0.000	0.000	0.806	1.241	0.757	1.550
CAPEX	2560	-0.068	0.749	-0.012	-0.062	0.946	1.058	0.562	1.800
R_D exp	2428	0.017	0.162	0.003	0.000	0.952	1.050	0.499	1.910
Tobin Q	2380	1.863	4.122	1.916	0.795	0.675	1.481	0.409	2.109

Panel B: Test of Differences

Variable	CEO Ext	CEO Int	Mean Dif	F Value	t Value
SA Index	2.975	3.3287	-0.3537	1.66***	-4.26***
High MAB	0.2135	0.1865	0.027	1.11*	1.6
Pers Intensity	0.2684	0.3536	-0.0852	51.27***	-0.86
Lag Fin Slack	-0.1414	-0.0287	-0.1127	1.24***	-2.32**
Fmr CEO Brd	0.0726	0.1233	-0.0507	1.6***	-4.64***
CEO Dual	0.0182	0.0221	-0.0039	1.21***	-0.77
CEO Tenure	3.7957	6.2524	-2.4567	1.65***	-12.32***
Pct Ind Dir	64.1123	61.622	2.4903	1.04	4.57
CEO Comp	14.4032	14.4958	-0.0926	1.04	-2.68***
Stdev Stock Ret	18.2483	27.3881	-9.1398	4.78***	-4.53***
Stdev ROA	4.4879	4.5658	-0.0779	1.07	-0.37
Leverage	0.4065	0.3551	0.0514	3.91***	2.6***
PCT Fem Exec	12.2758	9.761	2.5148	1.31***	4.16***
CEO Female	0.0632	0.0135	0.0497	4.43***	7.28***
CAPEX	-0.0472	-0.0891	0.0419	26.06***	1.43
R_D exp	0.0215	0.0127	0.0088	20.13***	1.33
Tobin Q	1.6716	2.0335	-0.3619	7.24***	-2.24**

Notes: This table reports the descriptive statistics for regression variables. See Appendix A for definition of all variables.

Table 2. Spearman Correlation Coefficients

		1	2	3	4	5	6	7	8	9	10	11
1	SA Index	1										
2	CEO External	-0.020	1	-	-	-	-	-	-	-	-	-
3	CEO Internal	0.06***	-0.72***	1	-	-	-	-	-	-	-	-
4	High MAB	-0.05***	0.03*	-0.030	1	-	-	-	-	-	-	-
5	Pers Intensity	-0.15***	0.04**	-0.06***	-0.05**	1	-	-	-	-	-	-
6	Lag Fin Slack	-0.16***	-0.04**	0.020	0.08***	-0.03*	1	-	-	-	-	-
7	Fmr CEO Brd	-0.03*	0.010	0.08***	0.020	0.000	0.05***	1	-	-	-	-
8	CEO Dual	-0.020	0.010	0.010	-0.04*	-0.020	0.04**	-0.03**	1	-	-	-
9	CEO Tenure	-0.010	0.06***	0.26***	0.010	0.000	-0.04**	-0.04**	-0.000	1	-	-
10	Pct Ind Dir	0.25***	0.11***	-0.10***	-0.07***	0.04**	-0.020	-0.20***	-0.08***	-0.05***	1	-
11	CEO Comp	0.35***	-0.020	0.04**	0.010	-0.04*	-0.020	-0.000	-0.03*	0.04**	0.32***	1
12	Stdev Stock Ret	0.020	-0.020	0.09***	0.020	0.05**	-0.020	0.04**	-0.030	0.06***	0.10***	0.09***
13	Stdev ROA	-0.04**	0.06***	0.000	-0.04**	-0.020	0.09***	0.05***	0.04**	-0.010	-0.07***	-0.15***
14	Leverage	0.28***	0.04**	-0.05***	-0.09***	0.09***	-0.16***	-0.07***	-0.06***	-0.04***	0.12***	0.09***
15	PCT Fem Exec	0.20***	0.08***	-0.07***	-0.000	-0.010	-0.020	-0.09***	-0.000	-0.09***	0.21***	0.12***
16	CEO Female	0.12***	0.19***	-0.12***	0.03*	-0.010	-0.010	-0.06***	-0.010	0.020	0.07***	0.03*
17	CAPEX	-0.06***	-0.020	-0.03*	0.06***	-0.020	-0.04**	0.000	-0.05***	-0.05***	-0.000	-0.010
18	R_D exp	0.000	-0.010	0.06***	-0.11***	0.18***	-0.000	-0.010	0.020	-0.000	0.18***	0.12***
19	Tobin Q	-0.32***	0.010	0.000	0.06***	0.18***	0.13***	0.05***	0.030	0.11***	-0.030	0.09***

		12	13	14	15	16	17	18	19
1	SA Index								
2	CEO External	-	-	-	-	-	-	-	-
3	CEO Internal	-	-	-	-	-	-	-	-
4	High MAB	-	-	-	-	-	-	-	-
5	Pers Intensity	-	-	-	-	-	-	-	-
6	Lag Fin Slack	-	-	-	-	-	-	-	-
7	Fmr CEO Brd	-	-	-	-	-	-	-	-
8	CEO Dual	-	-	-	-	-	-	-	-
9	CEO Tenure	-	-	-	-	-	-	-	-
10	Pct Ind Dir	-	-	-	-	-	-	-	-
11	CEO Comp	-	-	-	-	-	-	-	-
12	Stdev Stock Ret	1	-	-	-	-	-	-	-
13	Stdev ROA	0.04**	1	-	-	-	-	-	-
14	Leverage	0.020	-0.09***	1	-	-	-	-	-
15	PCT Fem Exec	0.12***	-0.05**	0.06***	1	-	-	-	-
16	CEO Female	-0.04**	-0.03**	0.010	0.33***	1	-	-	-
17	CAPEX	0.020	-0.010	-0.09***	0.030	-0.03*	1	-	-
18	R_D exp	-0.010	-0.05***	0.010	0.05**	-0.05***	-0.020	1	-
19	Tobin Q	0.06***	-0.000	-0.05***	0.03*	-0.010	-0.11***	0.15***	1

Notes: *p<0.05; **p<0.01; ***p<0.001. This table reports the Spearman Correlation Coefficients of regression variables. All variables are described in Appendix A.

Table III. Insider CEO, managerial ability and capital constraints

Variables	Dependent variable: SA Index		
	M1	**M2**	**M3**
Intercept	-11.85***	-11.94***	-11.86***
	(-13.9)	(-13.7)	(-13.6)
CEO Internal	0.418***		0.422***
	(4.69)		(4.7)
High MAB		-0.217**	-0.360***
		(-2.07)	(-2.78)
MAB*CEO Int			0.354**
			(2.24)
Pers Intensity	-0.0180	-0.0190	-0.0190
	(-1.33)	(-1.44)	(-1.48)
Lag Fin Slack	-0.240***	-0.251***	-0.260***
	(-6.39)	(-6.59)	(-6.86)
Fmr CEO Brd	0.343**	0.356**	0.383***
	(2.39)	(2.47)	(2.67)
CEO Dual	0.1880	0.2180	0.2740
	(0.59)	(0.67)	(0.85)
CEO Tenure	-0.027***	-0.018**	-0.021**
	(-3.4)	(-2.19)	(-2.5)
Pct Ind Dir	0.021***	0.022***	0.024***
	(5.37)	(5.54)	(6)
CEO Comp	0.927***	0.937***	0.907***
	(16.2)	(16.1)	(15.7)
Stdev Stock Ret	0.002**	0.002***	0.002***
	(2.42)	(3.01)	(2.66)
Stdev ROA	0.032***	0.042***	0.042***
	(3.45)	(4.2)	(4.21)
Leverage	1.593***	1.729***	1.784***
	(10.1)	(10.3)	(10.7)
PCT Fem Exec	0.008**	0.009***	0.008**
	(2.37)	(2.78)	(2.57)
CEO Female	0.419*	0.2980	0.478**
	(1.88)	(1.37)	(2.18)
CAPEX	0.0310	0.0330	0.0360
	(0.7)	(0.74)	(0.82)
R_D exp	2.854***	3.094***	3.006***
	(2.62)	(2.83)	(2.77)
Tobin Q	-0.092***	-0.093***	-0.096***
	(-8.57)	(-8.6)	(-8.92)
YEAR Fixed Effect	Yes	Yes	Yes
INDUSTRY Fixed Effect	Yes	Yes	Yes
Observations Used	1577	1491	1491
MSE	1.64	1.62	1.60
Fvalue	31.72***	32.48***	32.05***
R-Square	0.43	0.45	0.46

Notes: *p<0.05; **p<0.01; ***p<0.001. This table reports the results of the estimation of the relationship between Insider CEO, managerial ability and capital constraints. See Appendix A for definition of variables.

Table IV. Internal CEO, managerial ability and capital constraints in sub-sample of high and low constraints firms

| | | Dependent variable: SA Index | | |
| | HFC | LFC | HFC | LFC |
Variables	M1	M2	M3	M4
Intercept	-1.959**	-2.019**	-1.888*	-2.038**
	(-2.09)	(-2.25)	(-1.94)	(-2.27)
CEO Internal	0.274***	-0.326***		
	(2.71)	(-3.8)		
High MAB			-0.405***	0.266***
			(-3.26)	(2.91)
Pers Intensity	-0.615**	-0.0460	-0.706***	-0.0580
	(-2.55)	(-0.62)	(-2.96)	(-0.77)
Lag Fin Slack	-0.202***	-0.0180	-0.238***	-0.0260
	(-4.92)	(-0.5)	(-5.44)	(-0.69)
Fmr CEO Brd	0.718***	0.472***	0.906***	0.576***
	(4.3)	(3.68)	(5.25)	(4.44)
CEO Dual	-0.0860	-0.4020	-0.0470	-0.2040
	(-0.17)	(-1.54)	(-0.09)	(-0.76)
CEO Tenure	-0.0110	0.014**	-0.0090	0.0090
	(-1.3)	(2.02)	(-1.02)	(1.28)
Pct Ind Dir	0.017***	-0.0000	0.020***	0.0040
	(4.01)	(-0.2)	(4.49)	(1.03)
CEO Comp	0.449***	0.286***	0.457***	0.251***
	(7.09)	(4.9)	(6.94)	(4.28)
Stdev Stock Ret	0.004***	-0.0010	0.004***	-0.001*
	(3.61)	(-1.41)	(4.13)	(-1.71)
Stdev ROA	0.042***	0.0110	0.042***	0.015*
	(3.53)	(1.32)	(3.37)	(1.72)
Leverage	0.501***	0.0030	0.566***	0.0850
	(2.91)	(0.02)	(3.05)	(0.49)
PCT Fem Exec	-0.008**	0.0020	-0.006*	-0.0000
	(-2.29)	(0.61)	(-1.74)	(-0.17)
CEO Female	-0.1420	-0.573*	-0.1780	-0.3390
	(-0.79)	(-1.68)	(-1.02)	(-0.96)
CAPEX	-3.149***	-0.0130	-1.7920	-0.0110
	(-2.6)	(-0.52)	(-1.43)	(-0.46)
R_D exp	8.046***	2.921***	7.320***	3.008***
	(4.39)	(2.72)	(3.85)	(2.8)
Tobin Q	-0.592***	-0.033***	-0.707***	-0.036***
	(-9.14)	(-4.15)	(-8.86)	(-4.56)
YEAR Fixed Effect	Yes	Yes	Yes	Yes
INDUSTRY Fixed Effect	Yes	Yes	Yes	Yes
Observations Used	540	594	503	571
MSE	0.99	0.89	0.97	0.88
Fvalue	13.37***	9.25***	13.65***	9.0***
R-Square	0.49	0.37	0.51	0.38

Notes: *p<0.05; **p<0.01; ***p<0.001. This table reports the results of the estimation of the relationship between Internal CEO, managerial ability and capital constraints for sub-sample of firms in high and low constraint categories. See Appendix A for definition of variables.

Table V. Internal CEO, managerial ability and capital constraints in sub-sample of firms with default risks and non-default risks

	Dependent variable: SA Index			
Variables	**Default risk M1**	**Non Default risk M2**	**Default risk M3**	**Non Default risk M4**
Intercept	-7.045***	-12.46***	-7.499***	-12.38***
	(-3.15)	(-13.8)	(-3.26)	(-13.5)
CEO Internal	-0.0530	0.373***		
	(-0.22)	(3.97)		
High MAB			-0.3100	-0.1470
			(-1.14)	(-1.35)
Pers Intensity	-0.4950	-0.0140	-0.4090	-0.0160
	(-1.39)	(-1.09)	(-1.19)	(-1.22)
Lag Fin Slack	-0.189**	-0.248***	-0.178**	-0.265***
	(-2.21)	(-6.15)	(-2.09)	(-6.48)
Fmr CEO Brd	0.1280	0.444***	0.2980	0.428***
	(0.33)	(2.98)	(0.76)	(2.85)
CEO Tenure	-0.0050	-0.0130	-0.0040	-0.0070
	(-0.3)	(-1.6)	(-0.23)	(-0.82)
Pct Ind Dir	-0.0060	0.028***	-0.0010	0.028***
	(-0.71)	(6.61)	(-0.14)	(6.45)
CEO Comp	0.996***	0.891***	1.010***	0.891***
	(6.42)	(14.9)	(6.41)	(14.7)
Stdev Stock Ret	0.005*	0.002**	0.006**	0.002**
	(1.68)	(2.11)	(2.18)	(2.52)
Stdev ROA	0.0060	0.032***	0.0000	0.038***
	(0.25)	(3.21)	(0.02)	(3.63)
Leverage	0.803**	1.291***	0.875***	1.507***
	(2.52)	(7.04)	(2.68)	(7.83)
PCT Fem Exec	-0.0090	0.007**	-0.0070	0.009***
	(-1.09)	(2.22)	(-0.9)	(2.64)
CEO Female	-0.3170	0.635***	-0.1720	0.550**
	(-0.7)	(2.65)	(-0.4)	(2.33)
CAPEX	-0.8300	0.0270	-1.3470	0.0310
	(-0.31)	(0.63)	(-0.51)	(0.71)
R_D exp	8.183**	3.254***	7.448*	3.470***
	(2.01)	(2.95)	(1.89)	(3.14)
Tobin Q	-0.824**	-0.082***	-1.020***	-0.084***
	(-2.31)	(-7.69)	(-2.72)	(-7.73)
YEAR Fixed Effect	Yes	Yes	Yes	Yes
INDUSTRY Fixed Effect	Yes	Yes	Yes	Yes
Observations Used	224	1329	215	1260
MSE	1.35	1.58	1.34	1.55
Fvalue	9.86***	24.71***	10.03***	25.57***
R-Square	0.65	0.40	0.66	0.42

Notes: *p<0.05; **p<0.01; ***p<0.001. This table reports the results of the relationship between Internal CEO, managerial ability and capital constraints for sub-sample of firms with default risk and non-default risk. See Appendix A for definition of variables.

APPENDIX A: Variable Definitions

Labels	Definition
SA Index	The proxy for financial constraints. The Hadlock & Pierce (2010) Size-Age index. Calculated as: $SAindex_{it} = -0.737*Size_{it} + 0.043*(Size_{it})^2 - 0.040*Age_{it}$. Where $Size_{it}$ is the natural logarithm of Total Assets at year-end, Age_{it} is the number of years the firm is listed.
Insider CEO	Dummy variable '1' if the firm is led by CEO appointed from within the firm, '0' otherwise.
MAB	Managerial Ability Score, following the two-step method of Demerjian et al. (2012; 2013).
High MAB	Dummy variable '1' if the firm Managerial Ability Score for each year is within the top three decile rank for all firm managerial ability score for the year, '0' otherwise.
MAB*CEO Int	Managerial Ability Score multiply by dummy variable for Internal CEO led firms.
Pers Intensity	The ratio of employee wages and salary to revenue
Lag Fin Slack	One year lag of Financial Slack, calculated as cash and cash equivalents scaled by total assets.
Fmr CEO Brd	Dummy variable '1' if the firm retain former CEO on the board, '0' otherwise.
CEO Dual	Dummy variable '1' if the CEO is also the board Chairperson, '0' otherwise.
CEO Tenure	Natural logarithm value of the number of years the CEO has been in the position since the first appointment at the firm fiscal year-end.
Pct Ind Dir	The ratio of the number of independent directors on the board to total board size.
CEO Comp	Natural logarithm value of the sum of long term, equity-based compensation and Short-term, fixed compensation (salary, bonus, and other fixed annual payments) scaled by firm assets.
Stdev Stock Ret	A proxy for Firm Risk measure as the standard deviation of annual stock market return for the prior five years.
Stdev ROA	A second proxy for firm risk, measure as the standard deviation of annual operating return on assets for the prior five years.
Leverage	Ratio of book debt to book value of total assets.
PCT Fem Exec	The proportion of Female in the firm Top Management Team for each year.
CEO Female	Dummy variable '1' if the firm is led by a Female CEO, '0' otherwise.
CAPEX	A proxy for Capital Expenditure, measure as Capital Expenditure divided by Total Assets minus Cash and Cash Equivalents.
R&D exp	Research and development expenses divided by Net Sales.
TOBINQ	Sum of the book value of Long-term debt and market capitalisation of equity divided by the book value of total assets.