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The moderating effect of financial constraints on the relationship between stock price crash risk and managerial ability

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Abstract

Purpose – This study aims to empirically explore the influence of managerial ability on crash risk and the moderating effect of financial constraints on this interrelationship.

Design/methodology/approach – Using a sample of listed corporations in the Egyptian Stock Exchange during 2018–2021, the authors test the hypotheses by using the measures and methods well established in prior literature. The authors also conduct multiple robustness analyses to ensure the validity of the empirical results.

Findings – The findings suggest that managerial ability can effectively inhibit crash risk. In addition, the authors report that financial constraints significantly dampen this relationship. Thus, financial restrictions play a striking role in hampering the managerial ability to prevent stock crashes. Furthermore, the authors document that the moderating role of severe financing constraints is more prominent during the Covid-19 pandemic period.

Originality/value – The originality of this study stems from the following considerations. First, this study enriches relevant studies on crash risk by providing evidence from one of the emerging markets in the Middle East; thereby, contrasting with those in developed economies. Second, to the best of the authors' knowledge, this is the first study investigating the moderating impact of financing constraints on the managerial ability and crash risk nexus. Therefore, this work adds value to the extant knowledge by scrutinizing this important issue and providing novel empirical evidence.

Keywords Stock price crash risk, Managerial ability, Financial constraints, Capital markets, Emerging economy

Paper type Research paper

1. Introduction

Stock crash risk is considered as one of the major concerns in capital markets (Kim *et al.*, 2022). Stock price crashes, referred to as an unanticipated but sharp fall in stock prices

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Corrigendum: It has come to the attention of the publisher that the article by Ragia Shelih, Li Wang (2023), "The moderating effect of financial constraints on the relationship between stock price crash risk and managerial ability", published in the *International Journal of Accounting & Information Management*, Vol. 32 No. 1, pp. 122-146, https://doi.org/10.1108/IJAIM-03-2023-0065, features an error relating to the t-statistics. Specifically, the *t*-values reported in the last column of Table 8 were misaligned. The correct table will be available on request by the authors. The authors sincerely apologize for this mistake.

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(Zhang *et al.*, 2022), often impose devastating outcomes on investors' wealth and leading many firms to declare bankruptcy (Kim *et al.*, 2022). Pursuant to Jin and Myers (2006), the risk of stock collapse is partially due to managerial self-interest to deliberately hide negative information from outsiders, thus, increasing information asymmetry. Once the hoarded negative news reaches a specific threshold level and suddenly becomes available to the public, a steep drop occurs in stock price, leading to an immediate crash. Researchers further document that it erodes the direct interests of investors, triggers more selling, undermines the integrity of the financial market and leads to a collapse in investor confidence (Wen *et al.*, 2020; Jebran *et al.*, 2022). At the same time, the economic risks buried in stock price crashes also seriously threaten the firm's development and the country's real economy (Wen *et al.*, 2020; Hu *et al.*, 2020).

Prior literature has identified various determinants that are highly linked to collapse risk, such as firm characteristics (Hutton *et al.*, 2009; Kim *et al.*, 2011, 2020; Li *et al.*, 2020; Chen *et al.*, 2017; Khurana *et al.*, 2018), corporate governance mechanisms (Wang *et al.*, 2021; Robin and Zhang, 2015; Gao *et al.*, 2017; Callen and Fang, 2017; Hu *et al.*, 2020; Lobo *et al.*, 2020) and managerial characteristics, including CEO overconfidence, age and career concerns (Kim *et al.*, 2016; Lee *et al.*, 2019; Xu *et al.*, 2023; Andreou *et al.*, 2017; Chen *et al.*, 2021). Nevertheless, limited studies have examined the influence of managerial ability, as one of the key managerial characteristics, on crash risks. Also, there is a dearth of papers examining financial constraints and crash risk linkage (Bae *et al.*, 2021; Dang *et al.*, 2022; Deng *et al.*, 2023) and none of them have explored how financing constraints can affect the managerial aptitude and crash risk interplay.

This paper attempts to bridge a vacuum in the accounting and finance literature by addressing two questions. The first question examines whether managerial ability can mitigate crash risk. The paucity of papers investigating the managerial ability–crash risk nexus has provided mixed findings. For example, Cui *et al.* (2019) and Liu and Lei (2021) document that stock collapse is positively linked to CEO abilities and attribute higher levels of crash risk to competent managers' career concerns and incentives to obtain personal benefits through overinvestment. On the other hand, Park and Jung (2017), using data from South Korea, find that managerial ability increases firm disclosure transparency and that competent managers can mitigate stock plunges. There is clearly a lack of studies directly examining the interplay of management ability and stock crashes, especially in developing nations and the direction of this relationship is still equivocal. In a nutshell, managerial ability–crash risk nexus remains a key outstanding question. We document a hitherto unexplored reason for these opposing views, by claiming that such contradicting findings is possibly due to the fact that none of the preceding academic work scrutinized the moderating role of financial constraints which work against the impact of managerial ability in collapse risk. In our article, the most likely reason for this paradox could be the financing constraints effect. Consequently, our second question addresses whether the presence of financial constraints moderates managerial ability and crash risk linkage. Extant literature ignores the moderating role of financial constraints as an important yet unexplored variable in this relationship. Our study fills this void by considering managerial ability and financial constraints jointly.

Using a sample of observations for the period 2018–2021 for Egyptian companies listed in the Egyptian Stock Exchange (EGX), we find a significant negative association between managers' ability and stock plunges. More remarkably, we discover that the aforesaid interaction is hampered in firms with stringent financial restrictions. In this view, the managerial competency dynamic role in curbing crash risk significantly persists for financially sound firms only. Furthermore, we document that the moderating role of severe financing constraints is more pronounced during the Covid-19 pandemic period.

This article's contribution to the extant research is as follows. First, preceding research have examined the managerial ability–stock collapse nexus using data in developed markets (e.g. the USA and South Korea). Our study enriches the literature by examining this linkage in the EGX, one of the emerging markets in the Middle East, thereby, helping to contrast studies in emerging economies with those in developed economies. Second, to our knowledge, no other study has investigated whether financing constraints moderate the management ability and crash risk interplay. Going a step further, our article makes invaluable contributions to the extant scholarly work by exploring this important untapped topic and providing novel insights into the literature in this domain.

Remaining sections of our research are laid out as follows. Section 2 consists of the theoretical background and hypothesizing. Section 3 describes sample selection, methodology and variable measurement. Section 4 reports empirical analyses. Section 5 presents robustness tests results. Section 6 concludes the article.

2. Literature review and hypotheses development

2.1 Literature review

2.1.1 Stock price crash risk. Given the hugely damaged investor confidence and shareholder wealth caused by market crashes (Kim *et al.*, 2022), a burgeoning body of empirical research investigates stock price collapse determinants. Prior studies on crash risk can be classified into three streams.

The first stream investigates firm characteristics and behaviors influence on crash risk. In this context, Hutton *et al.* (2009) report that corporate reporting opacity exacerbates the possibility of future collapse. Kim *et al.* (2011) indicate that companies' aggressive tax planning activities engender stock price collapse risk through facilitating managerial concealment of bad news and rent extraction. Kim *et al.* (2020) indicate that financial reports complexity increases crash risk by allowing managers to successfully hide adverse information from outsiders. Li *et al.* (2020a) report that stock market crash is higher for companies with disclosure reports released during periods with low market attention. Authors of a number of studies also provide evidence that real income smoothing activities induce crash risk because of the managerial suppression of damaging information pertinent to business's prospects (Chen *et al.*, 2017; Khurana *et al.*, 2018). In addition, Loureiro and Silva (2022) point out that this positive relation is highly apparent in nations with weaker investor protection, poor information environment quality and low conservatism. Other studies report that the price of a stock is less likely to plummet for highly conservative firms (Wang *et al.*, 2021; Kim and Zhang, 2016); firms that mandatory adopt IFRS especially for nonfinancial firms with poor information environments (Houqe, 2018), and for firms that engage in CSR activities (Wu and Hu, 2019). Relatedly, Zhang *et al.* (2022) report that firms that report environmental, social and governance (ESG) activities reduce crash risk. Meanwhile, Wang *et al.* (2021) document that the social actions of banks exaggerate crash risk. They argue that bank managers are encouraged to engage in social responsibility practices to obtain the trust of shareholders and simultaneously facilitate negative news hiding, thus, engendering formation of stock market crash.

The second category of the scholarly academic work investigates the corporate governance mechanisms impact on stock collapse. Wang *et al.* (2021) find evidence that market crash is lower for companies with effective corporate governance. In a similar vein, several studies provide evidence that corporate governance can restrain the occurrence of the stock price collapse through high audit quality and audit industry specialization (Robin and Zhang, 2015), strong ownership concentration (Gao *et al.*, 2017) and long auditor tenure (Callen and Fang, 2017). Moreover, Hu *et al.* (2020) provide evidence that corporate board reforms reduce stock price collapse by arguing that improved board oversight enhances financial transparency and boosts firm investment efficiency. Lobo *et al.* (2020) report that internal control material weakness increases stock price collapse through information asymmetry.

The third stream of the literature focuses on how manager-specific characteristics affect crash risk. Previous studies report that stock crashes increase in firms with overweening CEOs (Kim *et al.*, 2016; Lee *et al.*, 2019) and particularly in countries with higher individualism (Xu *et al.*, 2023), and younger CEOs (Andreou *et al.*, 2017). Chen *et al.* (2021) document that higher stock price collapses are more probable for CEOs with early exposure to natural disasters because they are more accepting to risks pertinent to damaging news obfuscation. In recent years, a few studies explored the managerial ability and collapse risk interrelationship but have yielded confronting findings. For example, using empirical evidence from South Korea firms over the period of 2002–2014, Park and Jung (2017) report that competent managers negatively affect stock price collapse. They claim that skilled managers in collectivism countries tend to enhance transparency through voluntarily releasing additional disclosures, thus, decreasing crash risk (Song, 2015). While in investigating the same interaction in US companies, two concurrent papers, Habib and Hasan (2017) and Cui *et al.* (2019), show that managerial capability aggravates the incidence of stock plunges. They pinpoint that, pursuant to the rent extraction theory, career and reputational concerns induce more capable mangers to undertake risky activities that might result in unfavorable net present value, raising crash risk when the damaging information is released to the outsiders. However, Liu and Lei (2021) report that this positive association is only noticeable in companies with overconfident CEOs.

The fourth stream of the literature accentuates the influence of financial restrictions on collapse risk. Dang *et al.* (2022) provide evidence that financial obstacles amplify the negative interrelationship between bank deregulations and stock plummet. They assert that bank deregulation curbs financially constrained firms from bad news obscuring, thereby attenuating stock price plunge. In addition, Bae *et al.* (2021) investigate whether financial constraints moderates ESG and crash risk nexus. They discover that the negative interplay between ESG and stock market plunges is attenuated for companies with stringent financing constraints. Deng *et al.* (2023) assert that severe financial obstacles are the main channel through which patent infringement lawsuits exacerbate the incidence of stock plunges.

Despite the considerable documentation that investigated crash risk from different perspectives including firm specific characteristics, corporate governance and managerial characteristics, only a few papers directly examine managerial ability influence on crash risk. The scant existing research in this domain provides inconclusive findings about whether managerial ability increases or decreases stock price crashes and calls for more empirical evidence (Park and Jung, 2017; Habib and Hasan, 2017; Cui *et al.*, 2019; Liu and Lei, 2021). Therefore, this paper extends prior studies through examining managerial aptitude as a crucial factor influencing crash risk. Moreover, the studies on the financial constraints and crash risk nexus are still sparse and none of them considered the moderating role of financial restrictions on the crash risk and managerial ability interrelationship. Considering the foregoing, our paper strives to fill this void through investigating the moderating influence of financing constraints in the context of the Egyptian stock market as an important emerging economy in the Middle East.

2.1.2 Managerial ability. Managerial ability is referred to as the ability of executives to efficiently allocate corporate resources in generating high revenues and achieving firm success (Demerjian *et al.*, 2012), to understand the economies of the company and to make appropriate economic decisions (Demerjian *et al.*, 2012; Khan *et al.*, 2022; Xu *et al.*, 2021). In other words, it measures how managers can efficiently convert human and financial capital assets into high profit and investor value as compared to their peers in the same industry sector (Khan *et al.*, 2022).

Over the past two decades, a growing research stream in accounting literature has examined the impact of managerial ability from various dimensions and there are considerable empirical evidence supporting the notion that managerial aptitude is a significant determinant in corporate performance, earnings quality, financial reporting quality, investment decisions and earnings management (Lee *et al.*, 2018; Alqatamin *et al.*, 2017; Khoo and Cheung, 2022). This section is intended to summarize the existing literature on managerial ability through two research streams.

The first research stream considers the propitious role of managerial competency on corporate reporting and performance. Abernathy *et al.* (2018) pinpoint that talented executives are most likely to disclose financial reports in a timely manner. Baik *et al.* (2018) underscore managerial capability's role in enhancing the company's information environment. Xu *et al.* (2021) assert that superior managers are more apt to disclose high-quality financial reporting. Naheed *et al.* (2021) report that the positive influence of superior managers on company performance during the financial crises is only significant for financially flexible firms. Haider *et al.* (2021) reveal that managerial competence is more prone to conservative reporting to prevent any reputational damage and future career losses. Huang and Sun (2017) provide evidence that competent managers can efficiently use the company resources and realize profitable outcomes, thereby they are less likely to manipulate earnings. Likewise, García-Meca and García-Sánchez (2018) show that banks operating with competent managers are more expected to attenuate earnings management. Furthermore, according to Wang *et al.* (2017) competent managers are negatively related to fraudulent financial reporting. Other research papers investigate the positive influence of managers' capability on company performance. For example, Chen *et al.* (2015) document that managers with superior talents contribute in a positive way to the progress of corporate innovation projects. However, this positive association is lessened as CEO age and tenure increase. Inam Bhutta *et al.* (2021) and Phan (2021) find that managers possessing superior expertise and experience are positively related to corporate performance. Similarly, Ting *et al.* (2021) pinpoint that managerial aptitude can boost the business performance, but this level of enhancement diminishes for companies with high levels of leverage. Moreover, Gan (2019) reveal that competent managers are more expected to make favorable investment decisions as compared to less competent managers.

The second stream of literature documents the negative effects of managerial ability. Anggraini and Sholihin (2023) argue that managerial ability could promote earnings manipulation, such that talented managers may take advantage of opportunities to commit fraud and develop a concealment tactics. Also, Demerjian *et al.* (2020) pointed out that executives' ability promotes earnings management. Gul *et al.* (2018) report similar findings in the context of financially distressed firms. They indicate that the propensity of earnings manipulation by superior ability managers is sparked by firm financial distress to boost equity compensation and ease of the pressures on debt refinancing.

2.2 Hypotheses development

2.2.1 Managerial ability and stock price crash risk. Preceding literature linking managerial competency and the risk of stock collapse has documented inconclusive outcomes. Some studies report that talented managers increases the likelihood of stock market plummet (Habib and Hasan, 2017; Cui *et al.*, 2019; Liu and Lei, 2021). A conflicting view is that competent executives mitigate stock price collapse risk (Park and Jung, 2017). Our study expects managerial ability to have an inverse relationship with stock price collapse for three reasons.

First, management competency plays a consequential role in mitigating asymmetric information between insiders and outsiders. Companies operated by superior executives are more prone to produce timely financial disclosures to the market (Abernathy *et al.*, 2018) and high-quality financial reports and disclosures (Xu *et al.*, 2021; García-Meca and García-Sánchez, 2018). As a result, the information environment is better for companies with competent managers than for firms with incompetent managers (Baik *et al.*, 2018). Furthermore, managerial capability is negatively related to earnings management and fraud reporting, and, thus, a low incidence of bad news concealment (Wang *et al.*, 2017). This in turn alleviates the possibility of future crash occurrence.

Second, managers' aptitude significantly plays an indispensable role in making efficient financial and investment decisions (Phan, 2021). Firms with high managerial ability exhibit increased investment efficiency through investing in projects that generate profits and increase investors wealth (Khurana *et al.*, 2018). Competent managers possess superior knowledge and ability to identify favorable investment opportunities, use proper evaluation techniques and accurately anticipate future changes (Gan, 2019). Particularly, competent managers in financially unconstrained firms are more prone to participate in more value-creating and profitable projects (Lee *et al.*, 2018). Given that managerial ability is highly pertinent to better investment outcomes and firm performance, this will decrease the chances of firm stock price crash.

Third, Liu and Lei (2021) and Park and Jung (2017) state that individualist culture vs. collectivist culture plays a crucial role in explaining the direction of the managerial ability and risk of stock plunge nexus. On one hand, some studies advocate that firms in individualistic countries (e.g. the USA, the UK and other Asian countries) are linked to higher crash risk (An *et al.*, 2018; Dang *et al.*, 2022; Liu and Lei, 2021). They suggest that capable managers are driven by personal autonomy and interests to maintain career prospects and compensation levels, so they have strong willingness to modification and deviation from the status quo and higher tendency toward taking risks and hiding negative information, which is reflected in higher risk of stock market crash (Assmann and Ehrl, 2021). On the contrary, collectivism countries (e.g. South Korea, China, Indonesia and Middle East) are less associated with stock collapse (An *et al.*, 2018), because they emphasize the integration of individuals among groups, encourage loyalty and respect for superiors and discourage individuals to stand out (Assmann and Ehrl, 2021). Hofstede (1980) asserted in his landmark study Culture's Consequence that individualism prevails in developed and western countries, while collectivism is more prevalent in less developed and eastern countries. This statement is still valid and evident at present. According to the most recent Hofstede individualism-collectivism score posted on the website [1], 23 out of the 24 countries with individualism score higher than 60 are all developed countries, while the remaining 54 countries on the list with individualism score lower than 60 are mostly developing countries. This discernible systematic distinction between developed and developing nations establishes a unique ground to scrutinize the managerial ability–collapse risk nexus in Egypt. Since Egypt is considered as one of the collectivism and developing countries, superior managers are expected to place the group interests ahead of individual interests and they are less likely to act opportunistically or to obscure negative news. Thereby, broadly inhibiting crash risk.

Given the aforesaid arguments, our first hypothesis is:

H1. Managerial ability is negatively associated with stock crash risk.

2.2.2 Managerial ability, financial constraints and stock price crash risk. Financial constraints, referred to as firms facing substantial obstacles in raising external finance, are considered one of the most important obstacles for firm growth (Banerjee *et al.*, 2020). A plethora of studies include financial constraints as a control variable when scrutinizing the interplay between managerial ability and other factors (e.g. firm performance, trade credit, investment decisions and debt maturity), or crash risk and other factors (e.g. ESG, bank deregulation and patent infringement litigation). In this study, we want to explicitly investigate its interplaying role in the managerial ability–crash risk nexus. We contend that this interaction can vary in the presence of financial restrictions. As explained in subsection 2.2.1, the expected inverse interplay of managers' aptitude and collapse risk is supported by the notion that talented executives can obtain new financing and investment opportunities with beneficial outcomes (Lee *et al.*, 2018). They are associated with less opportunism, less information asymmetry, low incidence of negative information obfuscation and, thus, the resultant stock plummet (Habib and Hasan, 2017; Cui *et al.* 2019). Nevertheless, financial constraints can moderate this interaction for several reasons.

First, although superior executives are associated with profitable projects (Chemmanur *et al.*, 2009), financially constrained companies can force the managers to forego these investment opportunities because of the high cost of capital (Adu-Ameyaw *et al.*, 2021). In other words, superior ability managers are restricted from attractive investment projects to achieve firm growth due to severe liquidity constraints (Lee *et al.*, 2018). Firms facing financial constraints are more susceptible to poor financial performance (Hai *et al.*, 2022) and bad news related to inefficient investments and operations (He and Ren, 2022), thus, raising the possibility of stock price collapse. Second, Choo *et al.* (2021) reveal that executives' capability is positively linked to equity financing only for financially flexible firms. However, there is compelling evidence that financial obstacles limit competent managers from raising external finance and obtaining favorable credit terms for future projects because outsiders are concerned about the firm's future ability to repay debts (Khan *et al.*, 2022). Accordingly, raising capital through equity financing might induce managers to hide adverse information and provide an overly optimistic view of the firm before equity issuance to attract investors (Reichmann *et al.*, 2022); as a result, aggravating the chance of stock price plummet. Third, prior studies document that financial frictions increase managerial tendency to manipulate earnings. For example, earnings management can be used as tool by high-ability managers to overstate financial statements and conceal negative news to stabilize the stock prices (Kong *et al.*, 2021; Thanh Liem, 2021). Managers in financially constrained firms are disincentivized from revealing the firm's true financial conditions as this will magnify the negative impressions that capital providers have (Thanh Liem, 2021), and may exacerbate crash risk.

Fourth, some scholars in recent research denote that companies with high managerial aptitude are vulnerable to financial difficulties. The key behind this is driven by the talented managers' incentives to take risks as compared to their less peers, thereby increasing the firm's agency problems and the equity cost of capital (Mishra, 2014); their strong preferences to high debt financing to foster the firm's value which is highly profound for companies with financing obstacles and growth potential (Zahid *et al.*, 2023); and their overconfidence and overinvestment leading to inefficient investments (Habib and Hasan, 2017).

Given the inconclusive and conflicting outcomes in previous academic work concerning managerial aptitude and crash risk nexus, it is plausibly and rational to reexamine the aforementioned interaction by including financial constraint as a moderating factor. Because financial constraints can have opposite effects on crash risk, missing this variable can result in biased coefficients and muffle the influence of management ability on stock price plunges. By adding this variable in the examination, we can differentiate the effects of these two factors and contribute to the literature. On these grounds, we presume that financial constraints will hamper managerial ability effectiveness in alleviating crash risk. Hence, our second hypothesis is:

H2. The relationship between managerial ability and stock crash risk is less pronounced for financially constrained firms.

3. Methodology

3.1 Data

The sample of this research encompasses120 firms listed in the EGX for 2018– 2021 collected from the Thomson Reuters Eiko Database. Our selection of the research period is mainly due to the availability of the financial data for firms listed on the EGX. These sample firms are obtained after excluding firms with missing financial data. Also, companies in both financial and utility sectors are eliminated as their financial reporting standards and regulations are different from the rest of the sectors representing the EGX. This leaves us with 480 firm-year observations that are associated with 120 listed Egyptian firms. Table 1 exhibits industrial classification of our sample.

3.2 Variable measurement

3.2.1 Stock crash risk. Following preceding literature (Jin and Myers, 2006; Hutton *et al.*, 2009; Kim *et al.*, 2011), two crash risk proxies are used, based on firm weekly specific returns ($W_{i,t}$) which is the residual obtained from the model below:

$$R_{j,\tau} = \beta_0 + \beta_{1j} R_{m,\tau+2} + \beta_{2j} R_{m,\tau+1} + \beta_{3j} R_{m,\tau} + \beta_{4j} R_{m,\tau-1} + + \beta_{5j} R_{m,\tau-2} + \varepsilon_{j,\tau} \quad (1)$$

Industry	*N*	%N
Basic resources	60	12.5
Building materials	44	9.1
Contracting and construction engineering	40	8.3
Education services	8	1.7
Energy and support services	4	0.8
Food, beverages and tobacco	88	18.3
Health care and pharmaceuticals	44	9.1
Industrial goods, services and automobiles	20	4.2
IT, media and communication services	16	3.3
Paper and packaging	20	4.2
Real estate	76	15.8
Shipping and transportation services	16	3.3
Textile and durables	24	5
Trade and distributers	16	3.3
Travel and leisure	4	0.8
Total	480	100

Source: Authors' own work

Table 1. The sample classification according to industrial sectors

where $R_{j,t}$ is stock return j in week t, $R_{m,t}$ is the market return of each firm in week t and $\varepsilon j,t$ is the error term. Then, the firm-specific weekly return for firm i in week t ($W_{i,t}$) is computed as the natural log of 1 plus the residual return from equation (1), that is $W_{i,t} = ln\ (1+ W_{i,t})$.

The first proxy of crash risk is the negative conditional skewness of firm specific weekly return, *NCSKEW,* represented as the inverse value of the third moment of firm-specific weekly returns over the standard deviation of firm-specific weekly returns raised to 2/3:

$$NCSKEW_{i,t+1} = \frac{-\left[n(n-1)^{\frac{3}{2}}\sum w_{i,\tau}^{3}\right]}{\left[(n-1)(n-2)\left(\sum w_{i,\tau}^{2}\right)^{\frac{3}{2}}\right]} \tag{2}$$

where, i and t denote firm and year, respectively. a larger value of *NCSKEW* denotes a strong probability of stock collapse.

The second proxy is down-to-up volatility (*DUVOL*). For each firm i in year t, firm-specific weekly returns below the annual mean "down" weeks are separated from those with weekly returns above the annual mean "up" weeks. Then, the standard deviation of weekly returns for each of these sub-samples is computed separately. Finally, *DUVOL* is estimated using the natural logarithm of the ratio of the standard deviation of "down" weeks to the standard deviation of "up" weeks:

$$DUVOL_{i,t+1} = log\left[\frac{(n_{up}-1)\sum_{Down} W_{i,\tau}^{2}}{(n_{Down-1})\sum_{Up} W_{i,\tau}^{2}}\right] \tag{3}$$

where, where n_{up} is the number of observations in the up-group and n_{down} is the number of observations in the down-group. Greater values of both measures implies higher propability of stock crash.

3.2.2 Managerial ability. Demerjian *et al.* (2012) proposed data envelopment analysis (DEA) for measuring managers' ability. The first stage, estimates total firm efficiency score, referred to as the ratio of outputs over inputs by solving the DEA optimization model as follow:

$$Max\theta_t = (Sales_t).\left(V_1COGS_t + V_2SGA_t + V_3PPE_t + V_4OtherIntan_t\right)^{-1} \tag{4}$$

where, θ_t is the efficiency score for which the values range from 0 to 1. *Sales* is the output variable, and the four input indicators are:

(1) cost of goods sold (*COGS*);
(2) selling, general and administrative costs (*SGA*);
(3) net property, plant and equipment (*PPE*); and
(4) other intangible assets (*OtherIntan*).

In the next phase, a Tobit regression analysis is used to separate management efficiency from firm efficiency, since firm efficiency score reflects both firm specific factors and managerial ability.

$$\text{Firm Efficiency}_{i,t} = \alpha_0 + \alpha_1 \text{Ln (Total Assets)}_t + \alpha_2 \text{Market Share}_t + \alpha_3 \text{Positive Free Cash Flow}_t + \alpha_4 \text{Ln (Age)}_t + \alpha_5 \text{Business Segment Concentration}_t + \alpha_6 \text{Foreign Currency Indicator}_t + \text{Year}_t + \varepsilon_t \quad (5)$$

where, *firm efficiency* is the efficiency score obtained from equation (4), *Ln (Total assets)* represent natural log of the book value of total assets, *Market Share* is the sales of the firm divided by total revenues of all firms in the same sector, *Positive Free Cash Flow* represents a dummy variable coded as 1, for positive FCF and zero otherwise, *Ln (Age)* is the natural log of firm years since its inception, *Business Segment Concentration* is individual business segment sales to total sales, summed across all business sectors; *Foreign Currency dummy* is coded as 1, for firms reporting a non-zero value for foreign currency adjustment. The residual from equation (5) is the managerial ability score, referred to as MAS, which accurately depicts the impact of firm efficiency attributable to managers' aptitude.

3.2.3 Financial constraints. Following Li (2011), Bae *et al.* (2021) and Khan *et al.* (2022), the KZ index presented by Kaplan and Zingales (1997) is used as our main indicator of financial constraints and is described as follows:

$$KZ_{it} = -\left(1.002\frac{CF_{it}}{TA_{it}}\right) - \left(39.368\frac{Div_{it}}{TA_{it}}\right) - \left(1.315\frac{C_{it}}{TA_{it}}\right) + (3.139\ Lev_{it}) + (0.283\ Q_{it}) \quad (6)$$

where, *CF* indicate cash flows, computed as the sum of amortization and depreciation plus net income, *TA* represent total assets, *Div* represents the dividend payments, *C* represent cash and short-term investments, *Lev* represent the leverage, which is total liabilities divided by TA and *Q* is the Tobin Q, which is the assets market to book value. A higher KZ index indicates that a company is under more financial pressure.

3.2.4 Control variables. We follow earlier studies (Park and Jung, 2017; Cui *et al.*, 2019; Bae *et al.*, 2021; Kim *et al.*, 2011) and include control factors to isolate the impact of managerial ability on crash risk. *SIGMA*, which represents the standard deviations of firm-specific weekly return. *RET* is the average monthly return over year *t*. Furthermore, we control for firm characteristics including, *SIZE* which reflects the natural log of a firm's total assets in year *t*, *ROA* is net profit scaled by total assets in year *t*, *LEV* is of long-term debt divided by total assets in year *t* and *MTB* is the ratio of the firm's market value to the book value of equity. All controls are captured in the current period. Variables are explained in Appendix.

3.3 Research models

To empirically analyze managerial ability's impact on crash risk (*H1*), we predict Model 7 using the ordinary least squares (OLS) method:

$$Cras\,Risk_{it+1} = \beta_0 + \beta_1 MAS_{it} + \beta_2 Controls_{it} + Industry\ Fixed\ Effects + Year\ Fixed\ Effects + \varepsilon_{it} \quad (7)$$

where i is an index for firm and t is an index for time. The explained variables are crash risk that firm j incurs in year $t+1$ assessed by *NCSKEW* and *DUVOL* in equation (2) and equation (3). The explanatory variable is *MAS* in year t, based on the residual from equation (5). To support *H1*, this study predicts a significant and negative coefficient for *MAS*, which indicates that high managerial ability mitigates the risk of future crash. Controls are the variables mentioned in the previous section. To handle heteroskedasticity issues, robust standard errors are considered.

To analyze financial constraints' moderating effect on the managerial ability and crash risk interrelationship (*H2*), we estimate Model 8 using OLS method:

$$Cras\,Risk_{it+1} = \beta_0 + \beta_1 MAS_{it} + \beta_2 FC_{it} + \beta_3 MAS \times FC_{it} + \beta_4 Controls_{it} + Industry\ Fixed\ Effects + Year\ Fixed\ Effects + \varepsilon_{it} \quad (8)$$

FC is measured by the KZ index in year t. The main variable in equation (8) is the interactive variable MAS×FC. In line with *H2*, MAS×FC coefficient is expected to be positively significant. Robust standard error is considered to handle heteroskedasticity.

4. Empirical findings

4.1 Descriptive analysis

Table 2 displays key descriptive analysis for our study variables. The mean values for crash risk measures ($DUVOL_{t+1}$ and $NCSKEW_{t+1}$) are −0.239 and 0.0255, respectively, they are largely consistent with the inferences of Hutton *et al.* (2009), Kim and Zhang (2016), Kim *et al.* (2011). The managerial ability (MAS) mean value is −0.003, consistent with −0.004 stated in Demerjian *et al.* (2012). Regarding the financial constraint (FC) variable, the mean of the KZ index is around −0.3084. The mean values for Size, ROA, Lev and MTB are 14.742, 0.0259, 0.5610 and 2.136, respectively. We also conduct Kolmogorov–Smirnov test to examine the normality of the variables. To bring the variables to normality for the purpose of the OLS regression, data transformation is done by using the natural logarithm or square root as well as other procedures to process the data. The Kolmogorov–Smirnov test statistic results are displayed in Table 2. The level of significance for all transformed variables is more than 5%, suggesting that the data follows a normal distribution.

For the major variables examined in our paper, Pearson correlation matrix is shown in Table 3. Our results show a substantial positive linkage between the crash risk measures,

Variable	Mean	SD	25%	Min	75%	Max	Kolmogorov–Smirnov test statistic
$DUVOL_{t+1}$	−0.239	0.691	−0.710	−2.230	−0.227	1.7430	0.004
$NCSKEW_{t+1}$	0.025	0.981	−0.644	−2.890	−0.6946	2.8657	0.005
MAS	−0.003	0.223	−0.1826	−0.675	0.1209	0.6118	0.007
FC	−0.3084	2.565	−2.048	−7.686	1.4398	7.0949	0.003
SIGMA	0.0233	0.0048	0.02007	0.0102	0.0265	0.02431	0.005
RET	−0.000042	0.00255	−0.0017	−0.00739	0.00168	0.0072	0.003
SIZE	14.7422	1.5569	13.684	10.2733	15.788	19.956	0.003
ROA	0.0259	0.2770	−0.1629	−0.7762	0.2152	0.8266	0.004
LEV	0.5610	0.1771	0.4403	0.0499	0.6811	1.07041	0.003
MTB	2.1362	1.8436	0.8783	−2.78500	3.3989	7.4732	0.004

Source: Authors' own work

Table 2.
Descriptive statistics

Table 3. Correlation matrix

Variables	$DUVOL_{t+1}$	$NCSKEW_{t+1}$	MAS	FC	FC×MAS	SIGMA	RET	SIZE	ROA	LEV	MTB
$DUVOL_{t+1}$	1										
$NCSKEW_{t+1}$	0.344***	1									
MAS	−0.344***	−0.279*	1								
FC	0.058	0.027	−0.378***	1							
SIGMA	−0.059	0.323*	0.101**	−0.105**	−0.303	1					
RET	−0.016	−0.252*	−0.075**	−0.017	0.083**	−0.386***	1				
SIZE	−0.123***	−0.028	0.068*	0.032	−0.057	−0.131***	0.050	1			
ROA	−0.019	−0.092**	0.363***	−0.363***	−0.013	0.015	−0.078***	0.174*	1		
LEV	0.120***	0.073*	−0.164***	0.339***	−0.057	−0.014	−0.089***	0.019	−0.296***	1	
MTB	−0.045	0.062*	0.250***	−0.166***	−0.088**	0.297***	−0.204**	−0.230***	0.285***	−0.089***	1

Notes: The significance levels are denoted as *, ** and ***at 10, 5 and 1%, respectively
Source: Authors' own work

$DUVOL_{t+1}$ and $NCSKEW_{t+1}$, confirming that they both represent the same underlying construct. Moreover, at the 1% level, MAS is inversely correlated with both crash risk measures, offering preliminary support for *H1* that greater managerial ability reduces the risk of stock crash. The coefficients for all variables are below 0.50, thus, it can be judged that there is no collinearity problem that could affect the regression results. Furthermore, to identify possible multicollinearity issues, the variance inflation factor (VIF) is computed for all the variables. The untabulated findings reveal no serious multicollinearity issues as the VIF value ranges between 1.02 and 1.45 and is well below the threshold level.

4.2 Empirical analysis

4.2.1 The effect of managerial ability on stock price crash risk. The results of estimating equation (7) are presented in Table 4, where the $DUVOL_{t+1}$ and $NCSKEW_{t+1}$ in Models 1 and 2, respectively, are used as crash risk proxies. The effect of MAS is negative with a significance level less than the 1% level, indicating that skilled managers attenuate crash risk, thus, supporting *H1*. The reported results corroborate the previous findings of Park and Jung (2017), who document that competent executives have lower incidences of suppressing damaging information, thereby broadly lowering the chances of stock plunges. Consistent with previous studies (Habib and Hasan, 2017; Hu *et al.*, 2020), the controlling variable SIZE in model (1) is substantially negative at 5% level, alluding that stock prices are less likely to plummet for larger enterprises. In addition, LEV is substantially positive at the 1% level, supporting the view that increased level of debt increases stock crashes, thereby confirming (Bae *et al.*, 2021; Park and Jung, 2017; Kim *et al.*, 2016) findings. For the controlling variables in Model 2, following Jia (2018), SIGMA is positively significant at the 1% level. While RET is inversely related to stock crashes at the 5% significance level, confirming Kim *et al.* (2019) findings.

4.2.2 The moderating effect of financial constraints. Table 5 provides the empirical findings of predicting equation (8). Consistent with *H2*, the joint effect of MAS×FC coefficient across the two columns is substantially positive at the 5% level. This implies that

Variables	Dependent variables $DUVOL_{t+1}$ Model (1)	$NCSKEW_{t+1}$ Model (2)
Constant	−0.402 (−0.001)	−2.988 (−0.036)
MAS	−0.829***(−4.742)	−1.414*** (−5.786)
SIGMA	0.900 (0.101)	52.754***(3.791)
RET	−16.087 (−1.011)	−82.922** (−3.425)
SIZE	−0.040** (−2.037)	0.030 (1.043)
ROA	0.353***(2.850)	−0.002 (−0.011)
LEV	0.943***(4.434)	0.208 (0.667)
MTB	−0.008 (−0.419)	−0.010 (−0.384)
Observation	480 corrected total 479	480 (479)
Adjusted R^2	0.285	0.238
Robust standard errors	Yes	Yes
Year fixed effect	Yes	Yes
Industry fixed effect	Yes	Yes

Notes: The significance levels are denoted as *, ** and ***at 10, 5 and 1%, respectively. *t*-Statistics in parentheses
Source: Authors' own work

Table 4.
The effect of managerial ability on stock price crash risk (*H1*)

Table 5. Moderating role of financial constraints on MAS–crash risk nexus (*H2*)

Variables	Managerial ability and financial constraints interactions Dependent variables $DUVOL_{t+1}$	$NCSKEW_{t+1}$
Constant	−0.572 (−0.064)	−3.294 (−1.689)
MAS	−0.829*** (−5.017)	−1.584*** (−6.117)
FC	0.002 (0.157)	0.043** (2.120)
MAS×FC	0.509*** (8.204)	0.422*** (4.714)
SIGMA	−1.647 (−0.190)	49.174* (3.467)
RET	−20.104 (−1.318)	−90.404*** (−3.711)
SIZE	−0.032 (−1.636)	0.044 (1.474)
ROA	0.328*** (2.721)	−0.095 (−0.491)
LEV	0.898*** (4.642)	0.192 (0.618)
MTB	0.013 (0.699)	0.007 (0.240)
Adjusted R^2	0.409	0.287
Observation	480	480
Robust standard errors	Yes	Yes
Year fixed effect	Yes	Yes
Industry fixed effect	Yes	Yes

Notes: The significance levels are denoted as *, ** and ***at 10, 5 and 1%, respectively. *t*-Statistics in parentheses
Source: Authors' own work

skilled managers are restricted from curtailing the risk of stock price plunges at the presence of financing restrictions. Regarding the controls in Column 1, the crash risk measure ($DUVOL_{t+1}$) is positively linked to LEV and ROA. In Column 2, the crash risk measure ($NCSKEW_{t+1}$) is linked positively to SIGMA and negatively to RET. These findings concur with those of Kim *et al.* (2019).

5. Robustness tests

Several robust tests are conducted to ensure the reliability of our empirical findings.

5.1 Fixed effects

The firm fixed effects model is estimated to mitigate endogeneity concern regarding the unobservable firm attributes that can influence managerial ability and crash risk linkage. Table 6 shows the findings. As presented in Columns 1 and 2, the impact of MAS is substantially negative at 5% and 1%, respectively. The values of the interaction term MAS×FC are positive with a significance level less than the 1% across Columns 3 and 4. Furthermore, the result of MAS in Columns 7 and 8 are substantially negative only for unconstrained companies (NFC). Together, the results in Table 6 show that managerial ability can effectively restrain future stock price plunges; however, this impact is lesser for firms facing stringent financing constraints. Hence, our obtained results corroborate the robustness and the validity of the findings.

5.2 Subsample analysis

To provide further insights into *H2*, we split our sample into two sub-samples by classifying firms into either a financially constrained or a non-financially constrained subsample based on the KZ index median value. If a company's KZ index score is greater than the median value, the company is included in the financially constrained group (HFC = 1); otherwise, it

Table 6.
Endogeneity problem: firm fixed effects

	Full sample				KZ-index			
					High financially constrained subsample (HFC = 1)		Nonfinancially constrained subsample (NFC = 0)	
	$DUVOL_{t+1}$ Model (1)	$NCSKEW_{t+1}$ Model (2)	$DUVOL_{t+1}$ Model (3)	$NCSKEW_{t+1}$ Model (4)	$DUVOL_{t+1}$ Model (5)	$NCSKEW_{t+1}$ Model (6)	$DUVOL_{t+1}$ Model (7)	$NCSKEW_{t+1}$ Model (8)
Constant	1.024 (0.859)	0.108 (0.029)	2.143 (1.183)	1.482 (0.377)	4.616 (1.841)	1.891 (0.308)	4.326 (0.883)	0.896 (0.089)
MAS	−0.802** (−2.540)	−1.521*** (−3.154)	−0.574** (−2.014)	−1.546** *(−3.065)	0.233 (0.628)	0.161 (0.221)	−1.889** (−2.355)	−4.233*** (−2.868)
FC			−0.002 (−0.079)	−0.005 (−0.123)				
MAS×FC			0.558*** (4.704)	0.684*** (3.653)				
SIGMA	−18.625** (2.463)	58.503*** (4.422)	−15.372** (−2.110	58.302*** (4.391)	−35.405*** (−3.772)	62.246*** (3.547)	−1.768 (−0.136)	12.953 (0.563)
RET	−21.479 (−1.562)	−70.530*** (−3.186)	−27.841** (−2.164)	−70.532*** (−3.175)	−38.324** (−2.189)	−118.533*** (−3.837)	−7.906 (−0.368)	−22.829 (−0.611)
SIZE	−0.145 (−1.370)	−0.157 (−0.665)	−0.220* (−1.921)	−0.158 (−0.663)	−0.295* (−1.971)	−0.242 (−0.653)	−0.302 (−0.982)	−0.098 (−0.157)
ROA	0.302 (1.564)	−0.136 (−0.416)	0.234 (1.112)	−0.144 (−0.425)	0.781*** (3.148)	0.108 (0.230)	−0.058 (−0.124)	0.355 (0.469)
LEV	2.550*** (6.140)	0.142 (0.247)	2.488*** (5.624)	0.155 (0.270)	2.795*** (5.387)	0.322 (0.313)	2.408*** (2.909)	0.088 (0.106)
MTB	−0.006 (−0.137)	0.041 (0.672)	−0.019 (−0.526)	0.043 (0.685)	−0.040 (−0.745)	0.057 (0.675)	−0.007 (−0.085)	0.097 (0.805)
Adjusted R^2	0.424	0.267	0.518	0.335	0.502	0.462	0.586	0.392
Observation	480	480	480	480	240	240	240	240
Firm fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The table displays the OLS firm fixed effect results for the interrelationship between managerial ability and crash risk. The significance levels are denoted as *, ** and ***at 10, 5 and 1%, respectively. *t*-Statistics in parentheses
Source: Authors' own work

is included in the NFC group. The coefficients of MAS are then estimated separately for the two subsamples using equation (7) to see how they differ. The findings of the HFC/NFC subsample analysis are shown in Table 7. As illustrated, the negative effect of MAS on the possibility of stock crashes is only significant for unconstrained firms (NFC), indicating that managers' ability to curtail crash risk is restricted for companies facing severe financial constraints. Drawing on the findings, the presence of financing constraints significantly alters the managerial ability–crash risk nexus which corroborate those in Table 5.

5.3 Examining the moderating effect of financial constraints before and during covid-19

We also performed a robustness test by splitting the sample into two subperiods to compare the moderating effect of financing constraints before and during Covid-19 pandemic. The financial obstacles are expected to have increased during the Covid-19 pandemic period. This comparison would allow us to examine how the level of financial restrictions may have influenced the managerial ability and collapse risk interrelationship during the Covid period.

In this regard, we estimate equation (7) using the KZ index subsamples (HFC/NFC), for the periods: 2018–2019 as pre-Covid and 2020–2021 during Covid. As displayed in Table 8, we infer that MAS level remains relatively stable for both periods, while the level of financially restricted companies has increased during the Covid-19 as compared to the pre-Covid period which appears through the increase in the No. of observation of HFC firms form 107 in pre-Covid period to 133 during the Covid. In this regard, the moderating role of stringent financing constraints is more profound during the Covid-19 pandemic period.

Subsample analysis: partitioned by financially constrained and nonfinancially constrained firms

	KZ-Index			
	High financially constrained subsample (HFC = 1)		Nonfinancially constrained subsample (NFC = 0)	
	$DUVOL_{t+1}$ (1)	$NCSKEW_{t+1}$ (2)	$DUVOL_{t+1}$ (3)	$NCSKEW_{t+1}$ (4)
Constant	0.766 (1.222)	−1.898 (−3.158)	0.766 (1.222)	−1.042 (−1.134)
MAS	−0.151 (−0.760)	−0.420 (−1.597)	−2.127*** (−8.738)	−2.360***(−6.818)
SIGMA	−30.469*** (−4.379)	47.015*** (2.702)	18.888 (1.618)	49.469** (2.560)
RET	−37.18*** (−2.666)	−164.11*** (−6.006)	5.889 (0.314)	−37.971 (−1.222)
SIZE	−0.016 (−0.731)	0.033 (1.008)	−0.099** (−2.936)	0.005 (0.105)
ROA	0.053 (0.389)	−0.283 (−1.292)	0.544*** (2.640)	0.078 (0.288)
LEV	0.786*(3.684)	0.609* (1.911)	0.406 (1.436)	−0.061 (−0.157)
MTB	0.038* (1.893)	0.022 (0.746)	−0.061* (1.881)	0.001 (0.018)
Adjusted R^2	0.218	0.418	0.310	0.205
Observation	240	240	240	240
Robust standard errors	Yes	Yes	Yes	Yes
Year fixed effect	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes

Notes: The table exhibits the OLS results for financially constrained (HFC) and nonfinancially constrained subsample (NFC). The significance levels are denoted as *, ** and ***at 10, 5 and 1%, respectively. *t*-Statistics in parentheses
Source: Authors' own work

Table 7. The moderating effect of financial constraints (*H2*)

Table 8.
Moderating effect of financial constraints before and during covid-19

	Pre-covid-19 (2018–2019)				During covid-19 (2020–2021)			
	High financially constrained subsample (HFC = 1)		Nonfinancially constrained subsample (NFC = 0)		High financially constrained subsample (HFC = 1)		Nonfinancially constrained subsample (NFC = 0)	
	$DUVOL_{t+1}$ (1)	$NCSKEW_{t+1}$ (2)	$DUVOL_{t+1}$ (3)	$NCSKEW_{t+1}$ (4)	$DUVOL_{t+1}$ (5)	$NCSKEW_{t+1}$ (6)	$DUVOL_{t+1}$ (7)	$NCSKEW_{t+1}$ (8)
Constant	−1.167 (−2.313)	−1.594 (−1.985)	−0.215 (−0.263)	−1.476 (−1.198)	0.962 (1.652)	−3.228 (−3.617)	1.617 (1.490)	−0.567 (−0.387)
MAS	−0.172 (−0.562)	−0.385 (−0.868)	−1.936*** (−5.330)	−1.892*** (−3.568)	−0.365 (−1.371)	−0.596 (−1.549)	−2.278*** (−6.610)	−2.546*** (−5.201)
SIGMA	7.559 (0.733)	69.916*** (4.12)	29.993*(1.724)	29.701 (1.155)	−53.515*** (−5.327)	43.064** (2.845)	21.832 (1.015)	89.539*** (−2.382)
RET	16.466 (1.079)	−78.779*** (−3.459)	18.852 (0.767)	12.775 (0.433)	−79.667*** (−3.808)	−201.389*** (−6.155)	−35.760 (−0.940)	−122.778*** (−2.900)
SIZE	0.027 (0.983)	−0.040 (−1.014)	−0.068* (−1.661)	0.031 (0.492)	−0.038 (−1.091)	0.133*** (2.811)	−0.132** (−2.168)	−0.018 (−0.250)
ROA	0.027 (0.159)	0.246 (0.919)	0.511** (2.002)	−0.183 (−0.518)	0.089 (0.385)	−0.923*** (−3.201)	0.783** (2.037)	0.689 (1.573)
LEV	0.386 (1.454)	1.155*** (2.862)	0.699* (1.882)	0.787 (1.537)	0.890** (3.091)	0.138 (0.338)	−0.014 (−0.034)	−1.381*** (−2.553)
MTB	0.037 (1.692)	0.025 (0.846)	−0.037 (−0.809)	0.026 (0.466)	0.027 (0.870)	0.023 (0.569)	−0.114**(−2.569)	−0.049 (−0.978)
Adjusted R^2	0.006	0.375	0.272	0.127	0.256	0.373	0.349	0.399
Observations	107	107	133	133	133	133	107	107

Notes: The table displays the OLS results of the moderating effect of financial constraints for different sample periods (namely, pre-Covid 19 and during Covid-19 period) for HFC and NFC subsample based on KZ index. The significance levels are denoted as *, ** and ***at 10, 5 and 1%, respectively. *t*-Statistics in parentheses
Source: Authors' own work

5.4 Alternative proxy for managerial ability

We use high managerial ability (HMA) as an alternative proxy for MAS, following Naheed *et al.* (2021). Dummy variable HMA has a value of 1 when MAS exceeds the median and 0 otherwise. This measurement enables us to investigate whether high-ability managers achieve the same outcomes as those reported in Table 4. Based on equation (7), we rerun the OLS regression to examine *H1*. For brevity, the findings in Table 9, reveal a substantial inverse link between HMA and crash risk. Therefore, we verify the robustness of our findings.

5.5 Alternative proxy for financial constraints

We use dividends payout as an alternative measurement of financial constraints. Prior work (Hadlock and Pierce, 2010; Dyreng and Markle, 2016; Mansali *et al.*, 2019; He and Ren, 2022), document that companies that do not pay dividend are considered highly constrained. Accordingly, Dummy variable NODIV has a value of 1 if the company does not pay dividends and will be classified as highly financially constrained (HFC) and 0 otherwise. As illustrated in Table 10, the joint effect of MAS×NODIV on crash risk is substantially positive, thereby validate earlier results. Furthermore, we split the sample into two subsamples HFC and NFC based on dividend payment and the results in general remain robust.

6. Conclusions

Our research explores how managers' ability affect stock collapse risk by using data from the Egyptian companies listed on EGX from 2018–2021. Besides, we examine whether financial constraints play a role in this relationship. Our findings suggest that managerial ability can effectively curtail future stock plunges. The inferences corroborate earlier findings in the literature suggesting that competent managers are associated with better investment outcomes and firm performance, higher financial reporting and disclosure quality and less earning management, which in turn reduce future stock crashes. Furthermore, our findings demonstrate that this inverse relation is affected by firm financial constraints. The managerial ability to reduce crash risk is significantly dampened by firm

	$DUVOL_{t+1}$ (1)	$NCSKEW_{t+1}$ (2)
Constant	0.940 (1.928)	−0.604 (−0.925)
HMA	−0.382*** (−4.960)	−0.513*** (−4.421)
SIGMA	−2.490 (−0.282)	47.715** (3.33)
RET	−6.769 (−0.429)	−70.443*** (−2.764)
SIZE	−0.042** (−2.141)	0.025 (0.868)
ROA	0.331***(2.636)	−0.106 (−0.566)
LEV	0.971***(4.612)	0.317 (0.993)
MTB	0.002 (0.129)	0.001(0.035)
Adjusted R^2	0.291	0.221
Observation	480	480
Year fixed effect	Yes	Yes
Industry fixed effect	Yes	Yes

Notes: The significance levels are denoted as *, ** and ***at 10, 5 and 1%, respectively. *t*-Statistics in parentheses
Source: Authors' own work

Table 9. OLS alternative proxy for managerial ability (HMA)

Table 10.
Alternative proxy for financial constraints

	Full sample		High financially constrained subsample (HFC = 1)		Nonfinancially constrained subsample (NFC = 0)	
	$DUVOL_{t+1}$	$NCSKEW_{t+1}$	$DUVOL_{t+1}$	$NCSKEW_{t+1}$	$DUVOL_{t+1}$	$NCSKEW_{t+1}$
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	−0.419 (−0.59)	−3.052 (−1.668)	−0.929 (−1.615)	−0.611 (−0.663)	0.273 (0.317)	−3.500 (−3.073)
MAS	−1.182*** (−5.056)	−1.832*** (−5.635)	−0.343 (−1.545)	−1.118*** (−3.137)	−1.594*** (−4.829)	−1.808*** (−4.144)
NODIV	−0.087 (−1.412)	0.011 (0.115)				
MAS×NODIV	0.558** (2.046)	0.738* (1.943)				
SIGMA	1.332 (0.150)	53.740*** (3.581)	2.632 (0.249)	52.896*** (3.123)	−8.204 (−0.0.622)	54.572*** (3.130)
RET	−15.202 (−0.963)	−82.039*** (−3.383)	−14.669 (−0.713)	−75.393** (−2.284)	−42.355 (1.385)	−127.650*** (−3.158)
SIZE	−0.041** (−2.068)	0.030 91.022)	−0.026 (−0.935)	−0.024 (−0.546)	−0.040 (−1.175)	0.067 (1.492)
ROA	0.434*** (3.369)	0.028 (0.137)	0.130 (0.661)	0.065 (0.207)	0.709*** (2.884)	−0.032 (−0.100)
LEV	1.035*** (4.773)	0.305 (0.962)	1.528 ***(5.805)	0.364 (0.836)	0.302 (0.715)	0.397 (0.710)
MTB	−0.010 (−0.567)	−0.012 (−0.440)	−0.015 (−0.509)	−0.048 (−1.040)	0.022 (0.680)	0.020 (0.467)
Adjusted R^2	0.294	0.241	0.276	0.129	0.236	0.306
Observation	480	480	270	270	210	210
Year fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The significance levels are denoted as *, ** and ***at 10, 5 and 1%, respectively. *t*-Statistics in parentheses
Source: Authors' own work

financial constraints. For firms with stringent financial constraints, the effect disappears. In this regard, financial restrictions play a substantial role in hampering executives' ability to prevent stock crashes. Our findings stay robust after controlling for many factors, including industry, firm and year-fixed effects, endogeneity issues, alternative proxy of managerial ability and subsample analyses.

Our findings have implications for practice and theory. To the researchers' knowledge, this is one of the rare papers that address the managerial ability and crash risk link in an emerging Middle East economy. It broadens the scant studies on crash risk determinants by offering evidence from emerging markets. Thus, Egypt serves as a crucial setting for carrying out this study to compare the outcomes with those in developed countries. Second, we bring new evidence that severely constrained firms exaggerate crash risk, whereas financially sound peers attenuate crash risk, as managerial ability is ameliorated. Our article bolsters the favorable effect of curbing crash risk by talented managers and alludes that financing constraints alter the above interaction. Besides, the inferences of this moderation effect present empirical insights to stockholders and policymakers, by alluding that they should be attentive to a firm's financing constraints because managerial ability is limited in curtailing stock price crashes in the presence of financial constraints. More interestingly, the magnitude of the estimated coefficients suggests that managerial ability is stronger than financial constraints for their respective effects on crash risk. Considering the unique features and context of developing countries compared to the USA, this article might have consequential implications for stakeholders and regulators in Egypt and other developing economies. Taken together, our study and this stream of literature (Habib and Hasan, 2017; Zahid *et al.*, 2023; Mishra, 2014) suggest that highly capable managers can drag companies into financial difficulties because of their overconfidence, overinvestment and preference for high-debt financing and financial constraints can hamper the managers' ability to alleviate crash risk. These outcomes present an early warning that investors, managers and other stakeholders should consider because when these conditions or factors are present, they need to be prudent and take preventative measures if necessary.

Forthcoming research may expand the sample by considering both developed and undeveloped economies and exploring whether this relation can be modified by another factor, thereby bringing about new inferences to practitioners.

Note

1. See https://geerthofstede.com/research-and-vsm/dimension-data-matrix/. Last accessed on August 28, 2023.

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Appendix

Variables	Definition
Dependent	
$NCSKEW_{t+1}$	The forward one-year negative skewness of firm-specific weekly return over the fiscal-year
$DUVOL_{t+1}$	The forward one-year log ratio of the standard deviations of down-week to up-week firm-specific returns
Independent	
MAS_t	Managerial ability ranked score measure developed by Demerjian *et al.* (2012)
HMA	1 if MAS is above the median, otherwise zero
Moderator	
FC	According to Kaplan and Zingales (1997), KZ index, Financial Constraint measure is computed: $KZ_{it} = -\left(1.002\frac{CF_{it}}{TA_{it}}\right) - \left(39.368\frac{Div_{it}}{TA_{it}}\right) - \left(1.315\frac{C_{it}}{TA_{it}}\right) + (3.139\ Lev_{it}) + (0.283\ Q_{it})$
HFC	High financially constrained firms. 1 if the KZ score is above the median
NFC	Non financially constrained firms. 0 if the KZ score is below the median
NODIV	Dummy variable that has a value of 1 if the firm does not pay dividends
Controls	
SIGMA	SD of firm-specific weekly returns over year *t*
RET	Average of firm-specific weekly returns over year *t*
SIZE	Firm size calculated as the natural log of total assets
ROA	Return on Assets, computed by dividing net income by total assets
LEV	Leverage ratio, computed by dividing long-term liability by total assets
MTB	Market to book ratio, computed by dividing the market value by the book value of equity in year *t*

Source: Authors' own work

Table A1.
List of variable

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