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The Impact of CEO Overconfidence on Share Collapse Under The Moderating Role of Financial Statements Opacity: Evidence from Egypt

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Abstract

This study explores how CEO overconfidence affects the likelihood of share collapse in the context of an emerging market, Egypt, and how the financial statements' opacity moderates this effect. 82 firms listed on the Egyptian Exchange (EGX) between 2015 and 2022 were used as a sample, and regression analysis was used to test the effect of CEO overconfidence and financial statement opacity on two share collapse measures, DUVOL (negative skewness) and NCSKEW (volatility). The study finds that CEO overconfidence and financial statement opacity positively and significantly affect share collapse. This indicates that firms with overconfident CEOs and opaque financial reporting are more vulnerable to sudden and extreme drops in share prices. The researcher also finds that the interaction between CEO overconfidence and financial statement opacity amplifies the share collapse. The study contributes to behavioral finance and share collapse literature by examining an emerging market with different institutional characteristics from developed markets.

Keywords: Egypt, CEO overconfidence, financial statements opacity, share collapse, behavioral finance.

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تأثير الثقة المفرطة للرئيس التنفيذي على تدهور سعر السهم في ظل الدور المُعدل لغموض القوائم المالية: دليل من مصر

ملخص البحث

تتناول الدراسة الحالية إختبار تأثير الثقة المفرطة للرئيس التنفيذي CEO على مخاطر تدهور أسعار الأسهم في ظل الدور المُعدل لغموض القوائم المالية على هذه العلاقة بالتطبيق على مصر كأحد الأسواق الناشئة. وقد اعتمدت هذه الدراسة على عينة من 82 شركة غير مالية مدرجة في البورصة المصرية (EGX) عن الفترة من 2015 إلى 2022. وقد تم استخدام تحليل الانحدار لإختبار تأثير الثقة المفرطة لدى الرئيس التنفيذي وغموض الشركة على اثنين من مقاييس مخاطر انهيار أسعار الأسهم هما (DUVOL) Downside Volatility و(NCSKEW) Negative Skewness. وقد توصلت الدراسة إلى أن الثقة المفرطة للرئيس التنفيذي وغموض القوائم المالية يؤثران بشكل إيجابي وكبير على مخاطر انهيار أسعار الأسهم، حيث بينت نتائج الدراسة أن الشركات ذات الرؤساء التنفيذيين المفرطين في الثقة والتقارير المالية غير الشفافة يكونوا أكثر عرضة للانخفاضات المفاجئة والحادة في أسعار الأسهم. وتساهم هذه الدراسة في الأدبيات المتعلقة بالتمويل السلوكي ومخاطر انهيار أسعار الأسهم من خلال تقديم أدلة من سوق ناشئة ذات خصائص مؤسسية مختلفة عن الأسواق المتقدمة.

الكلمات المفتاحية: الثقة المفرطة للرئيس التنفيذي، غموض القوائم المالية، تدهور سعر السهم، التمويل السلوكي، مصر.

1. Introduction

One of the factors affecting a firm's share collapse is its CEO's overconfidence. Overconfidence is a cognitive bias that makes people overestimate their abilities, knowledge, and prospects. Overconfident CEOs may engage in excessive risk-taking, overinvestment, debt financing, and mergers and acquisitions, which can reduce the firm's value and increase share price volatility. Several studies have addressed the link between CEO overconfidence and the risk of share volatility, such as Malmendier and Tate (2005), Hirshleifer et al. (2012), and Chen et al. (2019). The researcher will use "share collapse" to describe share price crash risk. Another factor that can influence the share collapse is the opacity of its information environment. Opacity refers to the lack of transparency and disclosure of relevant information about the firm's operations, performance, and prospects. Opacity can increase the information asymmetry between managers and investors, leading to higher uncertainty, adverse selection, and moral hazard problems. Opacity can also amplify the effects of overconfidence on share collapse, as overconfident CEOs may use their informational advantage against shareholders. Some of the studies that have investigated the role of financial statement opacity in share collapse are Verrecchia (1983), Diamond and Verrecchia (1991), and Francis et al. (2005).

One of the main questions researchers have tried to answer is whether financial statement opacity moderates or mediates the effect of CEO overconfidence on share collapse. In other words, does financial statement opacity make the impact of CEO overconfidence stronger or weaker, or does it act as a channel through which CEO overconfidence influences share collapse?

The answer to this question has important implications for corporate governance and regulation, as well as for investors and analysts. The empirical evidence on this question is mixed and inconclusive. Some studies have found that financial statement opacity exacerbates the effect of CEO overconfidence on share collapse, suggesting that overconfident CEOs are more likely to

engage in earnings management, misreporting, or concealment of bad news when their firms are opaque, which increases the probability of a future crash (e.g., Woudenberg, 2017; Chen et al., 2018; Kim et al., 2016). Other studies have found that financial statements opacity attenuates the effect of CEO overconfidence on share collapse, implying that overconfident CEOs are more likely to disclose positive information or signal their confidence when their firms are opaque, which reduces the uncertainty and asymmetry in the market and lowers the likelihood of a future crash (e.g., Chen et al., 2019; Li et al., 2019; Wang et al., 2017). However, other studies have found that financial statement opacity does not have a significant impact on the relationship between CEO overconfidence and share collapse, indicating that other factors such as corporate governance, institutional ownership, or market conditions may play a more critical role in determining the outcome (e.g., Huang et al., 2018; Liu et al., 2019; Zhang et al., 2020).

Therefore, there is a need for a clear consensus on how financial statement opacity affects the relationship between CEO overconfidence and share collapse. More research is needed to reconcile the conflicting findings and to identify the underlying mechanisms and contingencies that shape this relationship. A better understanding of this issue can help policymakers design more effective interventions to mitigate the potential costs of CEO overconfidence and financial statement opacity for shareholders and society. However, most of these studies have focused on developed markets, and more is needed to be known about the determinants of collapse in emerging markets. Therefore, there is a need for more empirical research on this topic in the Egyptian context. As a result, this study will address the following questions:

1- How does CEO overconfidence affect share collapse?

2- How does CEO overconfidence interact with financial statement opacity to affect share collapse?

Therefore, this study will examine the relationship between CEO overconfidence and financial statement opacity and share collapse in Egyptian firms from 2015 to 2022 to fill this gap. Therefore, the current study aims to:

1- Investigate the impact of CEO overconfidence on share collapse in Egypt.

2- Investigate the interaction between CEO overconfidence and financial statements opacity on share collapse in Egypt.

The current study contributes to the literature on share collapse by providing evidence from an emerging market context, where institutional factors such as legal protection, investor rights, and market efficiency may differ from those in developed markets. The study also adds to the literature on behavioral finance by examining the role of CEO overconfidence in shaping corporate policies and outcomes. Furthermore, this study has practical implications for investors, regulators, and policymakers interested in understanding and mitigating the sources of share collapses. The rest of the study is organized as follows. Section 2 reviews relevant research and develops the study's hypothesis. Section 3 describes sample data and necessary variable measurements for empirical analysis. Section 4 describes and analyzes the study's findings; Section 5 highlights the main contributions, limitations, and future research implications.

2. Related literature and hypotheses development

One of the topics that has attracted considerable attention in the accounting and corporate finance literature is the relationship between CEO overconfidence and share collapse. CEO overconfidence refers to the tendency of some managers to overestimate their abilities and the prospects of their firms, leading them to undertake suboptimal investment decisions. Share collapse is the likelihood of a sudden and significant drop in a firm's equity market value. Several studies have investigated how CEO overconfidence affects share collapse and found mixed results (e.g., Ho et al., 2016; Kim et al., 2016; Liu et al., 2022; Qiao et al., 2022). Some studies suggest that firms with

overconfident CEOs have higher share collapse than firms with non-overconfident CEOs.The main argument is that overconfident managers are more likely to make poor investment decisions, ignore negative feedback, and withhold lousy news from investors. Those behaviors can lead to negative consequences for the company, such as share price volatility or crashes. As a result, bad news accumulates over time and eventually triggers a share collapse when revealed to the market. For example, Kim et al. (2016) found that CEO overconfidence positively correlates with future share collapse. The researchers also found that the impact of CEO overconfidence on the risk of share collapses is more pronounced when the CEO has a more substantial influence on the top management team and when there is more disagreement among investors about the company's prospects.

Similarly, Qiao et al. (2022) found that CFO overconfidence is positively associated with share collapse. The study also found that the overconfidence effect is intensified when CFOs collaborate with overconfident CEOs, thus raising share collapse. However, more robust governance and a transparent information environment constrain overconfident CFOs' effect on share collapse. Liu et al. (2022) provide evidence that CEO overconfidence is a significant risk factor for bank systemic risk. Their study suggests that it is essential for boards of directors and regulators to be aware of the potential risks associated with overconfident CEOs in the banking sector. Beshkooh and Keshavarz (2018) discovered that firms with overconfident managers are more likely to experience share crashes. Their study utilizes three indicators of managerial overconfidence: overinvestment, capital expenditure, and earnings forecast. Liang et al. (2020) find that firms with overconfident managers (such as CEOs or board chairs) face a higher risk of future share collapses than firms with non-overconfident managers. Their study suggests that overconfident managers tend to withhold bad news from the market, making their firms less transparent. The share price drops sharply when the lousy news accumulates and eventually becomes public. The study also finds that overconfident managers are more likely to disclose good news promptly, indicating a biased view of their firms' performance.

Other studies argue that firms with overconfident CEOs have lower share collapse than firms with non-overconfident CEOs. The primary rationale is that overconfident managers tend to be more optimistic and transparent about their prospects, communicate more frequently and candidly with investors, and disclose more information voluntarily. As a result, bad news is less likely to accumulate and cause a share collapse when released to the market. For instance, Hribar and Yang (2016) found that CEO overconfidence reduces share collapse using a sample of US firms from 1992–2009. They also find that the effect of CEO overconfidence on collapse is weaker when the firm faces more litigation risk or analyst coverage. Liu & Lei. (2021) indicate that managerial ability can be a double-edged sword. Competent managers, on the other hand, can make better judgments that result in greater firm performance. Conversely, overconfident, powerful managers may be more likely to take risks and hoard bad news, which can cause a share price collapse. Their study showed that investors and regulators should focus on these risks and take steps to mitigate them. For example, investors should be more careful about investing in companies with overconfident and competent managers. Regulators should also look at strengthening governance and enhancing information disclosure quality. Habib and Hasan (2017) found that managerial ability is negatively associated with share collapse. This means firms with more able managers are less likely to experience share collapse.

It is clear from the preceding studies that the results of previous studies differ in the relationship between CEO overconfidence and share collapse. The researcher believes this relation is complex and contingent on factors such as the CEO's role and power, characteristics and behavior, and the firm environment. Therefore, additional study is required to comprehend the workings of this relationship and its consequences for corporate governance and investor safety. As a result, the researcher develops the following first hypothesis:

H1. The likelihood of future share collapse is higher for firms with overconfident managers than those with non-overconfident managers, ceteris paribus.

Financial statement opacity refers to the degree of difficulty that investors, creditors, regulators, and other stakeholders need help understanding and evaluating a firm's financial performance and position. One of the leading hypotheses in the literature is that financial statement opacity increases share collapse by allowing managers to conceal bad news from the market and accumulate hidden negative information over time. When the bad news becomes too large or complicated to hide, it triggers a crash in the share price as the market reacts to the unexpected disclosure. This hypothesis is supported by several studies that have found a link between opaque firms and the risk of share crashes. Those studies conducted in different countries and contexts suggested a robust link. For example, Hutton et al. (2009) show that firms with less transparent financial reporting have a higher collapse in the US market. Chen et al. (2004) find that firms with higher earnings management and lower analyst coverage have higher collapse in China. Kim et al. (2011) find that firm tax avoidance is positively associated with share collapse, especially for firms with higher levels of information asymmetry and managerial entrenchment. This means that firms that engage in more tax avoidance are more likely to experience share collapse when there is less information available to investors and managers who have more power to make decisions that are not in the best interests of shareholders.

However, some studies also suggest that financial statement opacity may have a negative or insignificant effect on share collapse under certain conditions. For instance, Callen and Fang (2015) argue that financial statement opacity may reduce collapse by increasing the uncertainty and ambiguity about the firm's actual value, making it harder for investors to form extreme beliefs and overreact to bad news. They find that financial statement opacity mitigates collapse for firms with high growth opportunities and low leverage in the US market.

Kim and Zhang (2014) find that firms with more opaque financial reporting have higher expected collapse risk. This is because opaque financial reporting makes it difficult for investors to assess the firm's actual value, which can lead to sudden and significant declines in share prices. The positive relationship between financial reporting opacity and expected collapse is more robust for firms with higher information asymmetry and managerial entrenchment levels. Investors should be more cautious about investing in firms with more opaque financial reporting, and regulators should consider ways to discourage financial reporting opacity. Prior research has established that CEO overconfidence can result in share price collapse by prompting managers to postpone harmful news disclosure and overinvest in unprofitable projects (Kim & Zhang, 2016; Kim et al., 2016; Liang et al., 2020).

In the preceding, many studies dealt with the relationship between overconfidence and share collapse, and others dealt with the relationship between financial statements opacity and share collapse. However, no study addressed the moderating role of financial statement opacity on the relationship between CEO overconfidence and share collapse. Therefore, the current study argues that financial statement opacity can amplify the influence of CEO overconfidence on share collapse by enabling managerial bad news hoarding and resource misallocation. The researcher also argues that overconfident CEOs disclose good news promptly, irrespective of financial statements' opacity. Therefore, the researcher hypothesizes that CEO overconfidence amplifies the likelihood of extreme negative returns for firms with high opacity. This hypothesis forms the basis of the second hypothesis, which is stated as follows:

H2. Opacity in the financial statements magnifies CEO overconfidence's effect on share collapse.

3. Description of the data and methodology

3.1. Research approach

The study sample includes 82 non-financial firms listed on the Egyptian Exchange (EGX) between 2015 and 2022. Following Hutton et al. (2009), the study obtains those sample firms after completing the following screening procedures: eliminating firms in the financial services and insurance industries and excluding firms with missing values for the main variables used in the analysis. The ultimate sample comprises 682 observations of firm-year pairs, which are linked to 82 distinct firms. The financial information at the firm level was obtained from the official website of the Egyptian Exchange (https://egx.com.eg/en/HomePage.aspx).The researcher hand-collected the information regarding the CEO's educational background from the annual reports of the sample firms. All dummy variables are trimmed to the 1st and 99th percentiles to reduce the impact of outliers.

Table 1 shows firms' distribution by sector in the sample. The most represented sectors are Food, Beverages, and Tobacco (17.07%), Health Care and pharmaceuticals (14.63%), and Real Estate (14.63%). The least represented sectors are Utilities, Energy & Support Services, Trade & Distributors, etc., each with less than 3% of the total firms.

Table 1: Sample distribution

Sector	Firm	Observations	percent
Basic Resources	8	64	9.76%
Food, Beverages, and Tobacco	14	112	17.07%
Health Care & Pharmaceuticals	12	96	14.63%
Industrial Goods, Services, and Automobiles	4	32	4.88%
IT, Media & Communication Services	4	32	4.88%
Real Estate	12	96	14.63%
Travel & Leisure	6	48	7.32%
Utilities	1	8	1.22%
Energy & Support Services	1	8	1.22%
Trade & Distributors	2	16	2.44%
Shipping & Transportation Services	2	16	2.44%
Education Services	2	16	2.44%
Contracting & Construction Engineering	4	32	4.88%
Textile & Durables	3	24	3.66%

Building Materials	5	40	6.10%
Paper & Packaging	2	16	2.44%
Total	82	656	100%

3.2. Measurement variables

3.2.1. CEO overconfidence

One of the challenges in studying CEO overconfidence is how to measure it empirically. Different studies have used different proxies for overconfidence, such as gender, age, expertise, tenure, and duality. The researcher reviews some of the literature on these proxies and their strengths and limitations. Table 2 summarizes the measurement of CEO overconfidence based on five variables: gender, age, expertise, tenure, and duality. The variables in this study are based on earlier research findings on the association between CEO traits and overconfidence. The table also shows the supported studies for each variable and the references for those studies. Finally, the researcher has introduced a new variable called CEO overconfidence, which is set to 1 if the sum of the five dummy variables is more than 3 and 0 otherwise. This means a CEO is considered overconfident if he or she meets at least four of the five criteria.

Table 2 Measurement of CEO Overconfidence

Variable	Measurement	Supported Studies
Gender	If the CEO is a man, it takes the value 1. Otherwise, it takes the value 0.	Malmendier and Tate (2005), Graham et al. (2013).
Age	If the CEO's age is greater than or equal to a given threshold, the value is 1; otherwise, it is 0.	Hirshleifer et al. (2012), Cronqvist et al. (2016)
Expertise	If the CEO has a degree in business, this takes the value 1, and if not, it takes the value 0.	Ben-David et al. (2013), Hackbarth (2008)
Tenure	If the CEO's tenure is shorter than the sample median, it takes on a value of 1; if it is longer than the sample median, it takes a value of 0.	Goel and Thakor (2008). Campbell et al. (2011).
Duality	If the CEO is also the board chairman, set this to 1; otherwise, set it to 0.	Malmendier and Tate (2009), Li and Tang (2010)
CEO Overconfidence	If the sum of the five dummy variables is greater than 3, it is 1. Otherwise, it is 0.	This is a new variable created by the researcher.

The three proxies in Table 3 represent the opacity of financial statements. Earnings quality, auditing quality, and the standard deviation of analysts' profit estimates for a company over the following year are three measures of financial statement opacity.

Table 3 Measurement of Financial Statements opacity

Proxy	Model	Equation	Measurement	Supported Studies
Earnings quality	Modified Jones model	$TAC = \alpha[1/AT] + \beta1[(\Delta REV - \Delta AR)/AT] + \beta2[PPE/AT] + \varepsilon$ $DAC = TAC - NAC$	A weighted average of the absolute value of accruals at discretion over the preceding three years	Dechow et al., (1995) & Hutton et al. (2009)
Audit quality	Dummy variable		A binary variable that returns one if a firm is audited by one of the Big 4 and 0 otherwise.	Sharawi (2022)
The standard deviation of analysts' forecasts	Formula	SD = sqrt (sum ((x - mu) ^2) / N)	Earnings variance is the standard deviation from analyst forecasts for a company's upcoming fiscal year.	Jin and Myers (2006)

Where TAC is total accruals, AT is the lagged total assets, ΔREV is changes in revenues, ΔAR is the changes in accounts receivable, PPE is gross property, plant, and equipment, ε is the error term, DAC is discretionary accruals, and NAC is non-discretionary accruals. The coefficients α, $\beta1$, and $\beta2$ are estimated from a cross-sectional or time-series regression using a sample of firms not suspected of earnings management. Then, the estimated coefficients are used to calculate NAC for each firm in the sample of interest, and DAC is obtained by subtracting NAC from TAC. A positive (negative) value of DAC indicates income-increasing (decreasing) earnings management.

SD is the standard deviation, x is the forecast value, mu is the forecast mean, and N is the number of forecasts. The equation can be interpreted as follows:

- The researcher finds the difference between each forecast and the forecast mean (x – mu).

- Then, square each difference to make them positive and give more weight to significant deviations ((x – mu) ^2).
- Next, add up all the squared differences (sum ((x – mu) ^2)).
- After that, divide the sum by the number of forecasts to get the average squared deviation (sum ((x – mu) ^2) / N).
- Finally, take the square root of the average squared deviation to get the standard deviation (sqrt (sum ((x – mu) ^2) / N)).

Table 4 presents two proxies for share collapse risk. DUVOL measures the volatility of the negative returns (down) relative to the volatility of the positive returns (up). A higher DUVOL means that negative returns are more risky than positive ones, which means that share prices are more likely to drop by a lot. NCSKEW measures the asymmetry of the probability distribution of weekly share returns. A negative NCSKEW indicates that the distribution has a long–left tail, meaning there are more extreme adverse outcomes than positive ones.

Table 4: Measurement of Share Collapse

Proxy	Definition	Explanation	Supported Studies
DUVAL	$\ln[\sum(Rit - \bar{R}i)^2 / Td] - \ln[\sum(Rit - \bar{R}i)^2 / Tu]$	Down-to-up volatility. Measures the volatility of the negative returns (down) relative to the volatility of the positive returns (up). A higher DUVOL indicates that the negative returns are more volatile than the positive ones, implying a higher chance of large downward movements in share prices. DUVOL captures the asymmetric response of share prices to good and bad news.	Liang et al. (2020).
NCSKEW	$-(1/T) \sum(Rit - \bar{R}i)^3 / \sigma i^3$	The negative coefficient of skewness measures the asymmetry of the probability distribution of weekly share returns. A negative NCSKEW indicates that the distribution has a long-left tail, meaning there are more extreme adverse outcomes than positive ones. NCSKEW captures the extent of this asymmetry and reflects the probability of extreme negative returns.	Liang et al. (2020)
Rit	Weekly return for firm i in week t. A return is the percentage change in the price of a share over a given period.		
$\bar{R}i$	Mean weekly return for the firm i over the fiscal year. The mean return is the average weekly return for a given period.		

σi	The standard deviation(SD) of weekly returns for the firm i over the fiscal year. The standard deviation measures how much the weekly returns vary from the return mean.
T	Number of weeks in the fiscal year. The fiscal year is the 12-month period that a company uses for financial reporting.
Td	Number of weeks with negative returns for the firm i over the fiscal year. A negative return is a return that is less than zero.
Tu	Number of weeks with positive returns for the firm i over the fiscal year. A positive return is a return that is greater than zero.

Table 5 Measurement of Control Variables

Proxy	Measurement	Supported Studies
$Size_{t-1}$	It is computed by taking the natural logarithm of the total assets at the end of the year.	Sharawi (2022)
ROE_{t-1}	It is calculated by dividing net income by book equity value.	Hutton et al. (2009) and Liang et al. (2020)
M/B_{t-1}	It is calculated as the ratio of equity's market value to its book value.	Hutton et al. (2009); Liang et al. (2020)
LEV_{t-1}	It is determined by dividing total liabilities by total assets.	Sharawi (2022)
Neg_Skew_{t-1}	The negative skewness of the firm the previous year	Hutton et al. (2009); Liang et al. (2020)
Average $FSRET_{t-1}$	The average weekly return of a company over the past year.	Hutton et al. (2009); Liang et al. (2020)
Volatility $SIGMA_{t-1}$	The preceding year's firm-specific weekly return standard deviation.	Hutton et al. (2009); Liang et al. (2020)

3.3 Regression Models

Table 6 shows the research model used to test the hypotheses that CEO overconfidence and financial statement opacity are related to share collapse. The model is divided into two parts: H1 tests the impact of CEO overconfidence on share collapse, and H2 tests the moderating effect of financial statements opacity on the relationship between CEO overconfidence and share collapse. The dependent variable is share collapse, measured using two different variables: DUVOL and NCSKEW. The independent variable is CEO overconfidence, the moderating variable is financial statements opacity (measured by DD_{t-1}, $Big4_{t-1,}$ and SD analysts' 1-forecast), and Control variables (including firm size, profitability, leverage, and market-to-book ratio.

Table 6: Model of Research

Part 1: The Impact of CEO Overconfidence on Share Collapse (H1).
Share collapse = $\beta0+\beta1$ CEO Overconfidence $_{t-1}+ \phi$ $CONTROL_{t-1}$ + Year + Industry + ε_t The model is split into two parts to measure the dependent variable. The first model: Share Collapse (DUVOL) DUVOL =$\beta0+\beta1$ CEO Overconfidence $_{t-1}$ + $\beta2$ Size $_{t-1}$ + $\beta3$ ROE $_{t-1}$ +$\beta4$ M/B $_{t-1}$ + $\beta5$ LEV $_{t-1}$+ $\beta6$ Neg_Skew_{t-1}+ $\beta7$ Average FSRET $_{t-1}$ + $\beta8$ Volatility SIGMA $_{t-1}$ + Year+ Industry+ ε_t The second model: Share collapse (NCSKEW) NCSKEW =$\beta0+\beta1$ CEO Overconfidence $_{t-1}$ + $\beta2$ Size $_{t-1}$ + $\beta3$ ROE $_{t-1}$ +$\beta4$ M/B $_{t-1}$ + $\beta5$ LEV $_{t-1}$+ $\beta6$ Neg_Skew_{t-1}+ $\beta7$ Average FSRET $_{t-1}$ + $\beta8$ Volatility SIGMA $_{t-1}$ + Year+ Industry+ ε_t
Part 2: The moderating effect of financial statements opacity on the Relation between CEO Overconfidence and Share Collapse (H2).
Share collapse= $\beta0+\beta1$ CEO Overconfidence $_{t-1}$+ $\beta2$ CEO Overconfidence $_{t-1}$×Financial statements $opacity_{t-1}$+ $\beta3$ Financial statements $opacity_{t-1}$+ϕ $CONTROL_{t-1}$ + Year + Industry + ε_t The model is split into two parts to measure the dependent variable The first model: Share collapse (DUVOL) DUVOL =$\beta0+\beta1$ CEO Overconfidence $_{t-1}$ + $\beta2$ CEO Overconfidence $_{t-1}$×Financial statements $opacity_{t-1}$+ $\beta3$ Financial statements $opacity_{t-1}$+$\beta4$ Size $_{t-1}$ + $\beta5$ ROE $_{t-1}$ +$\beta6$ M/B $_{t-1}$ + $\beta7$ LEV $_{t-1}$+ $\beta8$ Neg_Skew_{t-1}+ $\beta9$ Average FSRET $_{t-1}$ + $\beta10$ Volatility SIGMA $_{t-1}$ + Year+ Industry+ ε_t The second model: Share collapse (NCSKEW) NCSKEW = $\beta0+\beta1$ CEO Overconfidence $_{t-1}$ + $\beta2$ CEO Overconfidence $_{t-1}$×Financial statements $opacity_{t-1}$+ $\beta3$ Financial statements $opacity_{t-1}$+$\beta4$ Size $_{t-1}$ + $\beta5$ ROE $_{t-1}$ +$\beta6$ M/B $_{t-1}$ + $\beta7$ LEV $_{t-1}$+ $\beta8$ Neg_Skew_{t-1}+ $\beta9$ Average FSRET $_{t-1}$ + $\beta10$ Volatility SIGMA $_{t-1}$ + Year+ Industry+ ε_t

4. Empirical findings

4.1. Descriptive data analysis

Statistics for the study's variables are summarized in Table 7. From 2015 to 2022, the sample spans 656 Egyptian Stock Exchange-listed firms observations. The mean (standard deviation) of share price risk measured by DUVOL is -0.081 (0.450), indicating that the average firm in the sample has an adverse change in share price volatility over the period. The mean (standard deviation) of share collapse measured by NCSKEW is -0.27 (0.677), suggesting that the average firm in the sample has an adverse change in share price skewness over the period. The mean (standard deviation) of CEO overconfidence is 0.201 (0.401), implying that about 20% of the CEOs in the sample are classified as overconfident based on their optional exercise behavior. The mean (standard deviation) of discretionary accruals is -0.219 (0.155), indicating that the average firm in the sample has a negative level of

earnings management. The mean (standard deviation) of BIG4 is 0.32 (0.195), implying that about 32% of the firms in the sample are audited by one of the Big Four audit firms.

The mean (standard deviation) of analysts' forecasts is -0.092 (0.094), suggesting that the average firm in the sample has a low degree of information asymmetry among analysts. The mean (standard deviation) of size is 14.69 (0.921), indicating that the average firm in the sample has a natural logarithm of total assets of 14.69. ROE's mean (standard deviation) is 0.094 (0.230), implying that the average firm in the sample has a return on equity of 9.4%. The mean (standard deviation) of M/B is 1.823 (1.187), suggesting that the average firm in the sample has a market-to-book ratio of 1.823. The mean (standard deviation) of Lev is 0.571 (0.190), indicating that the average firm in the sample has a leverage ratio of 57.1%. The mean (standard deviation) of Neg_Skewt-1 is -0.267 (0.662), implying that the average firm in the sample has a negative lagged skewness of share returns. The mean (standard deviation) of the average FSRET is -0.113 (0.165), suggesting that the average firm in the sample has a negative future share return six months after the earnings announcement. The mean (standard deviation) of Volatility SIGMA is 0.044 (0), indicating that the average firm in the sample has a volatility measure based on the standard deviation (SD) of share returns equal to 0.044. The high SD for CEO overconfidence and ROE suggests that these variables are essential drivers of corporate risk. Firms with CEOs who are overconfident or have high ROEs may be more likely to take on risky investments, which could lead to higher returns and volatility. As a result, investors should carefully consider these factors when making investment decisions. The descriptive statistics are consistent with previous studies on share price risk and CEO overconfidence, such as Hirshleifer et al. (2012) and Malmendier and Tate (2005).

Table 7: Descriptive Statistics

Variables	N	Min	Max	Mean	SD
Share price risk (DUVOL)	656	-7.526	3.617	-0.081	0.450
Share price risk (NCSKEW)	656	-3.537	3.75	-0.27	0.677
CEO Overconfidence	656	0	1	0.201	0.401
Discretionary accruals	656	-1.05	-0.007	-0.219	0.155
BIG4	656	0	1	0.32	0.195
SD analysts' forecasts	656	-0.527	0	-0.092	0.094
Size	656	12.101	18.747	14.69	0.921
ROE	656	-1.687	0.504	0.094	0.230
M/B	656	0.773	9.109	1.823	1.187
Lev	656	0.095	3.75	0.571	0.190
Neg_Skewt-1	656	-3.863	-0.001	-0.267	0.662
Average FSRET	656	-9.664	0.467	-0.113	0.165
Volatility SIGMA	656	0.004	1	0.044	0.018

4.2. Univariate analysis

Table 8 shows the results of univariate tests for the difference in share collapse between overconfident and non-overconfident CEOs. Share collapse is measured by two proxies: DUVOL and NCSKEW. DUVOL captures the volatility of share returns, while NCSKEW captures the asymmetry of share returns. The table indicates that overconfident CEOs have higher share price risk than non-overconfident CEOs, as DUVOL and NCSKEW are higher for the former group. The mean difference is positive and statistically significant at the 1% level for DUVOL and the 5% level for NCSKEW. The t-test and Wilcoxon test statistics are positive and significant, confirming that outliers do not drive the difference. These results are consistent with the hypothesis that overconfident CEOs tend to overinvest in negative NPV projects and ignore negative signals, leading to a buildup of bad news and a higher likelihood of share collapses. They also support the findings of previous studies that link CEO overconfidence to share price collapse (e.g., Kim et al., 2016; Hribar & Yang, 2016; Zhou & Huang, 2019; Liu & Lei, 2021).

Table 8: Univariate tests

CEO Overconfidence and share collapse				
	Share collapse (DUVOL)		Share collapse (NCSKEW)	
	Overconfident	Non-overconfident	Overconfident	Non-overconfident
N	131	525	131	525
Mean	-0.050	-0.089	-0.230	-0.280
Mean-Diff	0.039		0.050	
t-test	2.705***		2.310**	
Wilcoxon test	2.578***		2.174**	

Notes: Statistical significance ***, **, and * are statistically significant at 1%, 5%, and 10%, respectively.

4.3. Multivariate analysis for the first hypothesis

Table 9 provides the regression analysis results of CEO overconfidence and share collapse, measured by two alternative proxies: DUVOL and NCSKEW. DUVOL captures the volatility of share returns relative to market returns, while NCSKEW captures the degree of negative skewness in share returns. Both measures reflect the likelihood of extreme negative returns or share collapses. The table indicates that CEO overconfidence has a positive and significant effect on both measures of share collapse after controlling for other firm characteristics and fixed effects. This suggests that firms with overconfident CEOs are more prone to experience shared collapses than non-overconfident ones. The coefficients of CEO overconfidence are 0.047 for DUVOL and 0.057 for NCSKEW, implying that a one-unit increase in CEO overconfidence is associated with a 4.7% and 5.7% increase in share collapse, respectively.

These findings agree with previous studies that found an association between CEO overconfidence and share collapse. Overconfident managers are more likely to make poor investment decisions, such as overestimating the returns of their investment projects, and they are also more likely to ignore or conceal negative information about their firms' performance. This can cause negative consequences for the firm, such as share price volatility or collapses. As a result, they accumulate lousy news over time, eventually leading to a

sudden correction in share prices when the bad news is revealed or becomes too large to hide.

To compare these results with other studies, the researcher can look at recent studies examining the effect of CEO or CFO overconfidence on share collapse in different contexts. For example, Qiao et al. (2022) found that overconfident CFOs increase share collapse more than overconfident CEOs in US-listed firms, and this effect is more substantial when they collaborate. Qiao et al. (2022) also found that more robust governance and a transparent information environment mitigate the effect of CFO overconfidence on share collapse. Similarly, Kim et al. (2016) found that CEO overconfidence increases future firm risk, and this effect is moderated by institutional investors, especially mutual funds and foreign investors. However, they also found that CEO overconfidence is weaker in state-owned firms, which may reflect the influence of government intervention or political connections on firm risk-taking behavior.

Table 9: The Effect of CEO Overconfidence on Share Collapse

Variables	Share collapse (DUVOL)	Share collapse (NCSKEW)
Independent variable		
CEO Overconfidence	0.047***	0.057***
t	3.67	2.90
Control variables		
Size	0.018*	0.037***
t	1.78	2.87
ROE	-0.009	(-1.09) ***
t	-0.19	(-2.68)
M/B	0.031***	0.062***
t	5.81	6.72
Lev	0.53*	0.056
t	1.84	1.21
Neg_Skewt-1	0.001	0.024*
t	0.01	1.69
Average FSRET	(-0.057) **	(-0.045)
t	(-1.96)	(-1.26)
Volatility SIGMA	(-6.683) ***	(-5.850) ***
t	(-4.10)	(-4.60)
Intercept	(-0.216)	(-0.729) ***
t	(-1.11)	(-3.08)
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Adjusted R2	0.171	0.189
No. of Obs	656	656

Notes: Statistical significance ***, **, and * are statistically significant at 1%, 5%, and 10%, respectively.

These cross-country comparisons suggest that the effect of managerial overconfidence on share collapse may vary depending on the institutional environment, the governance structure, and the type and role of top managers. Therefore, it is essential to consider these factors when analyzing the impact of overconfidence on firm outcomes. Among the control variables, size, M/B, and Lev positively affect share price risk, while ROE, Average FSRET, and Volatility SIGMA have adverse effects. These results are generally in line with the literature on the determinants of share price risk. The adjusted R^2 values are 0.171 for DUVOL and 0.189 for NCSKEW, indicating that the model explains about 17% and 19% of the variation in share collapse, respectively.

Table 10 shows the effect of different components of CEO overconfidence on share collapse. Share collapse is measured by two indicators: DUVOL and NCSKEW. DUVOL captures the downside volatility of share returns, while NCSKEW captures the negative skewness of share returns. Both indicators reflect the likelihood of highly negative returns in the future. The table reports the regression coefficients and t-statistics of six CEO overconfidence components: CEO Gender, CEO Major, CEO Edu, CEO Ten, CEO Age, and CEO Dual. The table also includes other control variables, industry, and year-fixed effects. The sample size is 656 observations.

The main findings shown by the table are that CEO Age is positively and significantly associated with DUVOL at the 5% level, suggesting that older CEOs are more overconfident and prone to share collapses. None of the other CEO overconfidence components significantly affect DUVOL or NCSKEW, implying that they are not good proxies for CEO overconfidence or share collapse. The adjusted R^2 values are relatively low, ranging from 0.172 to 0.189, indicating that the model does not explain much of the share collapse variation. Based on these findings, the table provides weak evidence for the relationship between CEO overconfidence and share collapse. Only one component of CEO overconfidence, CEO Age, significantly impacts DUVOL, while none affects NCSKEW. The results suggest that other factors

may be more critical in determining share collapse than CEO overconfidence. A comparison with previous studies reveals that some have found similar results for CEO Age, while others have found different or opposite results for other components of CEO overconfidence (e.g., Kim et al., 2016; Liu & Lei, 2021). This indicates that the relationship between CEO overconfidence and share collapse may be contingent on firm characteristics, market conditions, and measurement issues.

Table 10: The Effect of CEO Overconfidence Components on Share Collapse

Variables	1	2	3	4	5	6
Panel A: share collapse ((DUVOL))						
CEO Gender	0.005					
t	0.48					
CEO Major		0.01				
t		0.6				
CEO Edu			0.014			
t			1.16			
CEO Ten				0.018		
t				1.51		
CEO Age					0.030**	
t					2.5	
CEO Dual						0.025
t						1.67
Other Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.179	0.176	0.174	0.172	0.173	0.18
No. of Obs	656	656	656	656	656	656
Panel B: Share collapse (NCSKEW)						
CEO Gender	(-0.000)					
t	(-0.02)					
CEO Major		0.031				
t		1.26				
CEO Edu			0.011			
t			0.58			

CEO Tenure				0.014		
t				0.71		
CEO Age					0.025	
t					1.43	
CEO Dual						0.038
t						1.52
Other Control variables	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R2	0.189	0.186	0.182	0.184	0.183	0.189
No. of Obs	656	656	656	656	656	656

Notes: Statistical significance ***, **, and * are statistically significant at 1%, 5%, and 10%, respectively.

4.4. Multivariate analysis for the second hypothesis

Table 11 shows the regression analysis results of the moderating effect of financial statements opacity on the relation between CEO overconfidence and share collapse. The table is divided into three panels, each using a different measure of financial statement opacity: discretionary accruals, BIG4 auditor, and standard deviation of analysts' forecasts. The dependent variables are DUVOL and NCSKEW, two proxies for share collapse. The independent variables are CEO overconfidence and its interaction with financial statements opacity. The table also includes other control variables, industry, and year-fixed effects.

The table indicates CEO overconfidence positively and significantly affects share collapse in Panel B, where the BIG4 auditor measures financial statements' opacity. This suggests that overconfident CEOs in firms audited by BIG4 are more likely to engage in risky investments or earnings management that increase the likelihood of future crashes. However, this effect is mitigated by the interaction term, which is negative and significant. This implies that the presence of a BIG4 auditor reduces the impact of CEO overconfidence on share collapse, possibly by enhancing the quality of financial reporting and monitoring.

In contrast, CEO overconfidence does not significantly affect share collapse in both Panel A and Panel C, where financial statements opacity is measured by discretionary accruals and standard deviation of analysts' forecasts, respectively. However, the interaction terms are negative and significant in both panels, indicating that higher levels of financial statement opacity weaken the relation between CEO overconfidence and share collapse. This may be because opaque firms face less market pressure and scrutiny, which reduces the incentives or opportunities for overconfident CEOs to take excessive risks or manipulate earnings. The main conclusion from the table is that financial statement opacity plays a moderating role in the relation between CEO overconfidence and share collapse. The direction and magnitude of this role depend on how financial statements' opacity is measured and how share collapse is proxied.

The table suggests that the relation between CEO overconfidence and share collapse depends on the level and measure of financial statements' opacity. This table also controls for other variables affecting share collapses, such as firm size, leverage, profitability, and growth opportunities. The table includes industry and year-fixed effects that account for unobserved heterogeneity across industries and periods. The table reports adjusted R^2 values that measure the goodness-of-fit of the regression models.

Overall, the results of Table 11 suggest that the moderating effect of financial statement opacity on the relation between CEO overconfidence and share collapse is significant. This means that the effect of CEO overconfidence on share price volatility and skewness is more potent when firms have higher levels of opacity.

Table 11: The moderating effect of financial statements opacity on the Relation between CEO Overconfidence and share collapse

Variables	Share collapse (DUVOL)	Share collapse (NCSKEW)
Panel A: Measuring financial statements opacity by Discretionary accruals		
CEO Overconfidence	(-0.006)	0.026
t	(-0.17)	0.35
CEO Overconfidence × Discretionary accruals	(-0.445) **	(-0.311)
t	(-2.33)	(-0.67)
Discretionary accruals	0.09	0.254
t	0.55	0.86
Discretionary accruals square	(-0.018)	(-0.175)
t	(-0.08)	(-0.44)
Other Control variables	Yes	Yes
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Adjusted R2	0.173	0.206
No. of obs	656	656
Panel B: Measuring financial statements opacity by BIG4		
CEO Overconfidence	0.049***	0.072***
t	4.68	3.82
CEO Overconfidence× BIG4	(-0.59) ***	(-0.082) *
t	(-3.48)	(-2.00)
Other Control variables	Yes	Yes
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Adjusted R2	0.173	0.198
No. of obs	656	656
Panel C: Measuring financial statements opacity by SD analysts' forecasts		
CEO Overconfidence	0.027	-0.004
t	1.52	-0.09
CEO Overconfidence× SD analysts' forecasts	(-0.241) ***	(-0.386)
t	(-3.89)	(-1.10)
SD analysts' forecasts	(-0.154) *	0.211
t	(-1.88)	1.27
Other Control variables	Yes	Yes
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Adjusted R2	0.204	0.189
No. of obs	656	656

Notes: Statistical significance ***, **, and * are statistically significant at 1%, 5%, and 10%, respectively.

6. Conclusion

This study investigated the effect of managerial overconfidence on share collapse in Egypt. Based on a sample of 82 non-financial firms listed on the EGX-100 index from 2015 to 2022, the findings suggest that financial statement opacity moderates the relationship between CEO overconfidence and share collapse. The direction and magnitude of this effect depend on how financial statements' opacity is measured and how share collapse is proxied. Specifically, the study found that CEO overconfidence positively and significantly affects share collapse when BIG4 auditor measures financial statements' opacity. This suggests that overconfident CEOs in firms audited by BIG4 are more likely to engage in risky investments or earnings management that increase the likelihood of future crashes. However, this effect is mitigated by the interaction term, which is negative and significant. This implies that the presence of a BIG4 auditor reduces the impact of CEO overconfidence on share collapse, possibly by enhancing the quality of financial reporting and monitoring.

In contrast, CEO overconfidence does not significantly affect share collapse when financial statement opacity is measured by discretionary accruals or standard deviation of analysts' forecasts. However, the interaction terms are negative and significant, indicating that higher levels of financial statement opacity weaken the relation between CEO overconfidence and share collapse. This may be because opaque firms face less market pressure and scrutiny, which reduces the incentives or opportunities for overconfident CEOs to take excessive risks or manipulate earnings. The study's findings have implications for investors, regulators, and policymakers. For investors, the findings suggest that they should be more cautious about investing in opaque firms that are led by overconfident CEOs. The findings suggest that regulators should focus on improving the quality of financial reporting and monitoring in opaque firms. Policymakers should consider policies that reduce firms' opacity and increase CEOs' accountability.

The study's findings are subject to several limitations. First, the study only includes data from a small subset of Egyptian businesses. Therefore, its results may only apply to Egypt. Second, the study uses limited measures of financial statement opacity and share collapse risk. Future research should address these limitations using a larger sample of firms from different countries, longitudinal data, and a more comprehensive range of financial statement opacity and share collapse measures.

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