

Article

Do Internal Corporate Governance Practices Influence Stock Price Volatility? Evidence from Egyptian Non-Financial Firms

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Abstract: The objective of this research paper is to investigate the association between internal Corporate Governance (CG) mechanisms and stock price volatility in Egypt as an emerging market. The paper investigates the impact of ownership structure and board structure as internal CG mechanisms on stock price volatility. Data are analyzed using a two-way fixed effects model, a one-step dynamic panel data model, and a panel weighted least squares model. The study concluded that ownership concentration has a negative influence on volatility. Interestingly, an inverted U-shaped relationship between the percentage of ownership by the greatest shareholder and volatility is evidenced. Managerial ownership also showed a negative influence on volatility. As for board structure mechanisms, the findings show that both board size and frequency of board meetings negatively influence volatility, whereas board independence has a positive impact.

Keywords: stock price volatility; corporate governance; ownership structure; board structure; emerging countries; Egyptian Stock Exchange (EGX); agency theory

JEL Classification: G30; G32; G34; G38



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1. Introduction

The stock market plays a key role in any economy by acting as a primary channel that facilitates the mobility of funds; allowing investors to earn a generous return on their investments and firms to raise the needed capital. This in turn may help improve economic conditions, promote investment, and financial stability (Mishkin and Eakins 2006).

According to Profilet (2013), volatility can be referred to as the rate of change in the value of a given financial security over a particular period, hence indicating risk; and the higher the volatility, the higher the probability of substantial loss or gain and the harder it is to predict future share prices. CG practices of a given company can be among the factors that affect its stock price volatility. In addition, since a considerable portion of investors are risk averse by nature, they are likely to care much about the volatility of their investments and would prefer to invest in stocks whose earnings are more predictable, hence, less risky.

The existence of the principal-agent problem explained by Jensen and Meckling (1976) has directed researchers' attention towards examining numerous techniques for dealing with the conflict of interest between managers and stockholders. Accordingly, several studies attempted to explain how CG practices can contribute to an improved financial performance as well as lower risk levels (Shahwan and Habib 2020).

According to Shleifer and Vishny (1997), agency theory explains and resolves various issues that exist in the relationship between shareholders who are considered the principals and managers who are considered the agents. As far as corporations' success and survival are concerned, it is necessary to deal with the agency problem, a problem triggered by the separation of ownership and control; where managers become driven to use company

resources to achieve their own interests, rather than stockholders' interests. When it comes to mitigating the agency problem, one of the most potent solutions is the adoption of proper CG practices and mechanisms. CG practices aim to guarantee that managers properly use the company's capital so that shareholders can generate return on their investments and allow them to monitor the behavior of managers.

Mezhoud et al. (2017) explain that a reduced level of information asymmetry is a valuable outcome of improved CG practices, and consequently, stock prices would become more efficient, trading volume is expected to increase, while the bid-ask spreads and the stock return volatility are expected to decrease.

CG mechanisms can either be internal or external, and this study focuses on the internal mechanisms that refer to the internal tools and methods used by firms for the purpose of ensuring that management is working towards maximizing shareholders' wealth. Several internal governance mechanisms can be employed, such as ownership structure, board of directors, as well as audit committees. The board of directors is considered the backbone of the firm as they play an indispensable role in the CG process of firms so that it is possible to curb the agency problem. The board refers to a number of individuals who have several authorities and responsibilities related to monitoring and controlling of all the management's activities to ensure that the firm is performing as planned and in a way that protects shareholders' best interests. Moreover, they are legally accountable for the decisions they make on behalf of the firm owners, and they also have the authority to hire new members and employees (Sharma 2017).

According to Ezazi et al. (2011), ownership structure has several facets including whether shareholders are part of the board of directors; is ownership focused or disseminated; is the number of shareholders large or small; are shareholders domestic or foreign; and whether shareholders are individuals or institutions. It is argued that ownership structure is expected to influence firm performance, and this was confirmed by the findings of many previous studies.

As postulated by Gitman and Zutter (2011), in the absence of potent internal governance mechanisms, it is hard to guarantee that managers will act towards maximizing the value of the firm. This is especially true if firms have plenty of free cash flows as managers usually have the motive to pursue their own interests rather than those of shareholders and would undertake unprofitable investments just for the higher compensation and prestige involved, thereby risking shareholders' wealth.

As Appuhami and Bhuyan (2015) suggest, CG is country specific and therefore its influence on volatility may differ from one country to another. This paper extends the existing literature by exploring the volatility of share prices in the Egyptian context, and providing insight into how the adoption of CG practices can reduce risk levels, and minimize corruption and manipulation, whether by managers or majority shareholders. Since 2011, Egypt experienced major political, economic, and social changes, and recently embarked on an ambitious economic reform program that focuses on fighting corruption, encouraging doing business, and restoring investors' confidence, which amplifies the role of CG, and makes Egypt an interesting setting for examining CG practices (Abdel-Meguid 2021). Additionally, the flotation of the Egyptian pound that took place at the end of 2016 and its potential impact on the level of market uncertainty, volatility of share prices, and stock market activity, increased the importance of identifying effective CG mechanisms that can help control volatility of share prices, maintain an active stock market, and attract foreign investors, whether through portfolio investments or foreign direct investments.

The current study is, as far as could be ascertained, the first to investigate the impact of internal CG on volatility. It addresses the impact of both ownership and board structures as potential deterrents to the high volatility that characterizes Egyptian stocks, thereby providing more thorough implications for several parties. Moreover, the paper does not only rely on statistical significance to identify the major practices of CG that can affect volatility, but it also considers the effect size so as to reinforce the findings and unveil the

CG mechanisms having high practical significance, hence can serve as the basis for an effective strategy formulation and policy implementation.

The study is applied on non-financial firms that are listed in the Egyptian Stock Exchange (EGX), where its main objectives include the following:

- Identify the impact of ownership structure on stock price volatility.
- Understand the impact of board structure on stock price volatility.
- Explain how the findings in the Egyptian context compare to those concluded by past studies in other developing and developed countries.
- Compare the findings of different models to provide more robust conclusions.

Several factors explain the motivation for the current study. With regard to the literature gap, previous studies that tested the impact of CG mechanisms on stock price volatility in other contexts did not reach conclusive results. Additionally, some of the CG mechanisms tested in past studies (such as foreign ownership and institutional ownership) are no longer publicly disclosed by many of the Egyptian firms, hence the findings of those studies cannot be generalized on the Egyptian market. Nevertheless, limited studies were applied on emerging markets, and no similar studies in the Egyptian market given its unique characteristics to be discussed in the coming section.

Several past studies relied on a CG index to assess CG practices (e.g., [Shahwan 2015](#); [Shahwan and Fathalla 2020](#); [Samontaray 2010](#); [Malik 2012](#); [Rani et al. 2013](#)), which can be a highly practical and convenient approach. However, [Abd-Elsalam \(1999\)](#) and [Kamel and Shahwan \(2014\)](#) suggest that the weights assigned to the items included in the index might sometimes be subjective and may not reflect the actual importance of each component which might vary for each country, industry, or even company, and may adversely influence the scoring of the index. Therefore, the current study relies on a quantitative proxy for each of the CG mechanisms, in order to capture the individual influence of each mechanism on the volatility of share prices.

According to [Maher and Andersson \(2000\)](#), in a market where ownership is highly concentrated, like the Egyptian market, conflict of interest is aggravated due to the probable emergence of a conflict between controlling shareholders and minority shareholders, in addition to the usual conflict of interest between shareholders and managers. Therefore, the impact of CG on stock price volatility can significantly differ from that in a market where ownership is relatively more dispersed. Accordingly, conclusions regarding effective CG practices in some countries might not be transferable to others. This argument was confirmed by [Dahawy \(2009\)](#) by explaining that there exist major differences among developing nations; therefore, it is necessary to study each country at an individual level. Consequently, there is a need for additional research in order to identify the necessary improvements in the Egyptian CG practices which can possibly contribute to lower volatility.

Furthermore, although some past studies investigated the influence of board gender diversity on other forms of risk, no previous studies tackled the influence of gender diversity or women representation in the board on the volatility of share prices. All the aforementioned factors provide the rationale for the current study. Accordingly, the paper contributes to the body of knowledge by providing solid empirical evidence and addressing the controversy surrounding CG and share price volatility in the Egyptian market. The paper includes several CG mechanisms in order to provide more thorough conclusions and unveil various effective mechanisms that can be employed to control volatility, taking into account the CG dimensions that are disclosed by Egyptian firms and ensuring compatibility with the Egyptian environment. In an attempt to increase the robustness of the findings, three different estimation models will be employed.

The study is expected to provide important implications to various parties, including enabling investors to make more informed investment decisions that are based on a better prediction of stock price volatility. This may encourage financial managers to rely on internal CG as an essential tool that can mitigate the agency problem and control the fluctuations and volatility of the firm's share price, hence its cost of capital. Finally, this can encourage regulators to direct more attention to the notion that CG practices adopted by

firms can be considered an important tool for reducing volatility and having a more active stock market. Accordingly, improved CG practices can contribute to countless positive outcomes for the Egyptian market, including encouraging mobilization of savings, allowing for a more efficient allocation of capital, protecting minority shareholders' rights, promoting investment, increasing job opportunities, raising confidence in the national economy, and they may also facilitate economic growth (Dahawy 2009).

The rest of the paper is organized in the following manner: the next section combines the findings of past studies that tested the impact of internal CG mechanisms on stock price volatility in several contexts. Section 3 explains the methods used in the study. Section 4 includes the findings and discussion of the results. Finally, Section 5 concludes.

2. Literature Review and Hypotheses Development

This section is divided into two parts. The first part provides an overview of CG in Egypt and the second part summarizes past studies investigating the impact of CG mechanisms on stock price volatility.

2.1. Corporate Governance in Egypt

Concerning the characteristics of the Egyptian market, Egypt is the first country in the Middle East and North Africa (MENA) region that implements CG principles (Kenawy and Abd Elgany 2009). Also, what differentiates Egypt from other emerging economies is being one of the largest markets in the region, an attractive market for foreign direct investment (FDI), one of the largest markets with respect to the number of listed companies, and the country with the highest population in the MENA region. However, improving CG practices is considered crucial in attracting FDI (Nasr and Ntim 2018). CG in Egypt came a long way, with more effective rules and regulations and greater awareness with the CG concept. However, it did not start gaining momentum until the late 1990s (Abdel-Meguid 2021). Developing nations are usually characterized by the late establishment of reforms and CG practices, while developed nations like the US, Hong Kong, and the UK, started their reforms as early as the late 1970s, 1980s, or early 1990s (Nasr and Ntim 2018).

In 1992, The Capital Markets Law No. 95/1992 was enacted, where it outlines the rules of listing and delisting Egyptian firms, regulates firms, and the issuance of securities, in addition to the stock exchange (Nasr and Ntim 2018). This law facilitated investment and privatization, in addition to providing alternative sources of financing for businesses, which previously relied mainly on bank loans (Sullivan 2003). Later the Central Depository Law (CDL, 93/2000) was enacted. It defines procedures for facilitating trading and transactions, reducing risks associated with trading securities through clearing and settlement, and maintaining a quick exchange of securities (Nasr and Ntim 2018).

During the early 2000s, the Egyptian stock exchange experienced a high level of market concentration, and firms were characterized by high ownership concentration levels. Compared to other emerging markets like Argentina, Brazil, Morocco, and Saudi Arabia, Egypt ranked first in terms of the number of listed firms, while it had a low ranking in terms of market capitalization, which may be attributed to the small size of firms (Sullivan 2003). In the same vein, Bremer and Elias (2007) explained that the Egyptian Stock Exchange has the largest number of listed firms in the MENA region; however, the market capitalization of the Egyptian market is less than that of other countries, including Saudi Arabia, Kuwait, Qatar, Dubai, and Abu Dhabi. The Egyptian market seems to include several listed firms that trade a small portion of their capital, where the rest is held by founders and large strategic investors who do not trade their shares.

The reforms in Egypt started back in 2001 when the world bank applied a country assessment. Some positive indicators included the regulations in Egypt protecting shareholders' rights in dividends and voting and the accounting and auditing standards almost conforming to the international criteria (Desoky and Mousa 2012). However, several improvements were necessary, including higher disclosure for the ownership and control structures, a more emphasized role for shareholders' meetings, board of directors, and the

professional conduct of auditors. Accordingly, in 2002, the Egyptian Stock exchange started developing rules requiring listed firms to disclose certain attributes of board members and managers, and contracts with auditors, which later resulted in the delisting of almost 100 firms from the exchange (Nasr and Ntim 2018).

The Egyptian government developed the Egyptian Institute of Directors (EIoD) in 2003, which aimed at increasing awareness, strengthening boards of directors, and improving CG. In 2004, the World Bank conducted a re-assessment which showed an improvement in the implementation of the Organization for Economic Cooperation and Development (OECD) principles of CG (Dahawy 2009). Another assessment was conducted by the World Bank in 2009. Although the assessment praised the improvements in the legal, regulatory, and institutional frameworks, CG laws and regulations were still lacking enforcement, particularly in smaller firms (Abdel-Meguid 2021). The first Egyptian Code of Corporate Governance (ECCG) was issued in 2005 by the EIoD in accordance with the guidelines of the OECD, followed by two revised versions in 2011 and 2016 (Abdel-Meguid 2021; Samaha et al. 2012). The code includes rules concerning boards of directors, general assembly, external auditors, internal audit departments, conflicts of interest, and disclosure of social policies (Ebaid 2011; Soliman and Abdel Salam 2013). Concerning board composition, it should include a majority of competent non-executive members, and the board should meet once every three months at minimum (Ebaid 2011). Also, the board size should not be less than five members (ECCG 2011; Nasr and Ntim 2018). The ECCG is based on a “comply or explain” approach so that it is not obligatory for companies to comply. However, when some firms fail to comply, they sometimes provide unreasonable or invalid reasons (Nasr and Ntim 2018). Unlike developed markets, the CG regulations included in the Egyptian code are neither obligatory nor legally-binding; instead, they are voluntary to help encourage responsible behavior and maintain high levels of transparency consistent with international best practices, and hence may lack legislative force (Soliman and Abdel Salam 2013). However, as suggested by Sorour (2014), compulsory compliance with the code can be crucial for improving CG practices. In this regard, Shahwan and Fathalla (2020) explain that the “comply or explain” approach is considered an initial step towards the transition into a mandatory adoption of CG guidelines in the near future.

According to Samaha et al. (2012), the CG practices of some Egyptian listed firms are still lagging behind the regulations on the books. Despite improvements in financial reporting, few firms disclose details of their ownership and governance structures, or predictable risk factors, and the performance of many boards of directors needs to be improved, where the majority of boards are insider boards (World Bank 2009). The ECCG (2016) asserts the importance of disclosing different aspects of ownership structure; however, as explained by Egypt for Information Dissemination (EGID), some ownership structure dimensions, including foreign ownership and institutional ownership, are no longer included by several firms in their reports after 2015, hence are not available for the period of the current study.

In several developing countries, including Egypt, ownership is usually concentrated (Wahba 2015), resulting in the inability of minority shareholders to access information about the firm. Nonetheless, the lack of separation of ownership and control may result in a lower agency cost. However, developed countries, including the UK and US, are characterized by dispersed ownership, high investor protection, and independent boards (Nasr and Ntim 2018).

The Egyptian Financial Supervisory Authority (EFSA) was established in 2009, for better monitoring and regulation. Later in 2017, EFSA became known as the Financial Regulatory Authority (FRA). The FRA deals with regulating and supervising financial markets and securities. Recently, the FRA issued Decision No. 100, in 2020, providing certain mandatory CG rules that present a clear and comprehensive regulatory framework encouraging compliance, and deals with the board of directors, general assembly meetings, and controlled environment, transparency and disclosure (Abdel-Meguid 2021). Bremer and Elias (2007) reported some factors that may impede the development of CG in Egypt, including the ownership structure of firms, with several family owned or closely

held firms whose capital needs are mainly financed by bank loans, the lack of awareness with the CG concept and its importance, lack of board independence, enforcement mechanisms, and low levels of disclosure. However, [Abdel-Meguid \(2021\)](#), explained that the CG landscape in Egypt significantly improved, with more effective rules and regulations, better disclosure practices, and greater familiarity with the CG concept.

In many situations, a conflict of interest may arise between shareholders and managers, referred to as Type I agency problem. Better CG practices can help mitigate the agency cost associated with this conflict of interest and ensure that managers' activities are more aligned with shareholders' interests, thus contributing to a lower volatility for the firm's share price ([Mezhoud et al. 2017](#); [Thanatawee 2021](#)). As explained by [Easterbrook \(1984\)](#), if shareholders are spread, there will be a weak incentive for monitoring the activities of management since the monitoring cost can exceed the benefits to shareholders. However, if shareholders form large groups, then they would exert pressure on managers to consider their best interests; also, if there is a high level of managerial ownership, then managers' objectives can be better aligned with those of shareholders. Accordingly, ownership and board structures may act as control mechanisms, and help control the principal-agent problem, leading to lower volatility.

Moreover, since the Egyptian market is characterized by high levels of ownership concentration, then there would also be a high likelihood of a Type II agency problem, which refers to the conflict of interest that occurs between controlling shareholders and minority shareholders. Controlling shareholders can engage in several actions leading to the expropriation of minority shareholders and the agency problem can become more aggravated ([Ratnawati et al. 2016](#)). Accordingly, the concentrated ownership prevailing in several Egyptian firms may seem to stimulate the conflict of interest between majority and minority shareholders; on the other hand, it may also help alleviate the conflict of interest between managers and shareholders. In conclusion, it is extremely important to adopt the proper CG mechanisms that can help minimize conflicts of interest and reduce risk levels in the Egyptian market.

2.2. Corporate Governance and Stock Price Volatility

A number of past studies investigated the impact of internal CG on stock price volatility and firm value, and many of them were based on agency theory. However, these studies reached no consensus, leaving the controversy surrounding the aforementioned relationship unresolved. [Hashemijoo et al. \(2012\)](#) described share price volatility as a benchmark for evaluating risk, which refers to the pace and extent of change in the price of a given share over a certain time period; where the greater the volatility, the higher the likelihood of a gain or a loss in the short-term.

Internal CG mechanisms refer to the set of controls and methods that are used to monitor managers' activities, reduce managers' discretionary space, and to take actions to achieve the firm's goals and maximize shareholders' value ([Sharma 2017](#); [Horsthuis 2019](#)). Such mechanisms are generated within the firm and usually include board structure, ownership structure, ownership concentration, and executive compensation ([Denis and McConnell 2003](#); [Dharmastuti and Wahyudi 2013](#); [Sharma 2017](#); [Raithatha and Haldar 2021](#)).

As stated by [Horsthuis \(2019\)](#), many studies claimed that board composition can play a vital role in monitoring the behavior of firms' management, where board size and board independence are considered important dimensions of board structure. Additionally, several studies argued that ownership structure and concentration can act as an effective internal CG mechanism. Given that firms have several types of shareholders including individuals, institutions, insiders, and other corporations, such mechanism can measure the extent to which controlling shareholders can exert influence on managers and affect their practices ([Thomsen and Pedersen 2000](#); [Horsthuis 2019](#)).

In the context of developed nations, [Tan and Liu \(2016\)](#) investigated the impact of the length of CEO tenure, CEO's board committee membership, the ratio of executive

directors, and independent directors on the idiosyncratic volatility of share prices in Australia. They also developed a CEO power index which was based on a combination of CEO board committee membership, in addition to the ratios of executive and independent directors, where it was found that the power index has a significant negative impact on idiosyncratic volatility.

[Mezhoud et al. \(2017\)](#) studied the impact of internal governance mechanisms including ownership structure and board structure on stock return volatility for firms listed in the Paris Stock Exchange. The results of their study showed that ownership structure components (i.e., ownership concentration, managerial ownership, and institutional ownership) had no significant impact on stock return volatility, while board structure components including board independence, CEO duality, and board size had a significant negative impact. Also in France, [Aloui and Jarboui \(2018\)](#) examined the impact of CG on stock return volatility during the financial crisis of 2007 for firms listed on the SBF 120 index. The independent variables included the chief executive officer (CEO) dummy variable, the independent directors, and outside directors. The findings of their study showed that outside directors and the CEO had a significant positive impact on stock return volatility.

Additionally, [Aloui and Jarboui \(2019\)](#) examined the impact of domestic ownership on the stock return volatility of financial and non-financial companies listed on the SBF 120. The findings showed a significant negative relationship between domestic institutional investors and stock return volatility, which implies that domestic investors can play a stabilizing role in the French market.

In the context of developing countries, [Ogbeide and Evbayiro-Osagie \(2019\)](#) studied the impact of CG mechanisms including audit committee size, ownership concentration, managerial ownership, and board independence on share price volatility in Nigeria. The study relied on Generalized Autoregressive Conditional Heteroskedasticity GARCH (1,1) and found that audit committee size had a significant positive impact on stock price volatility, while managerial ownership and board independence had a significant negative impact. Also in Nigeria, [Ajukwara et al. \(2022\)](#) examined the impact of board characteristics on stock price volatility. The study was applied on insurance companies that were listed on the Nigerian Exchange Group. Board characteristics included board size, board ownership, and frequency of board meetings. The results revealed that board size and frequency of board meetings have a significant positive impact on share price volatility. Additionally, [Issshaq et al. \(2009\)](#) investigated the impact of CG, ownership structure, and cash holdings on the value of firms listed on Ghana Stock Exchange. CG variables included board size, board independence, and board intensity. The results indicated a significant positive relationship between board size and share price.

[Lee et al. \(2019\)](#) studied the relationship between CG and stock return volatility for publicly listed companies in 11 countries all over Asia, and their findings supported the notion that CG can lessen stock return volatility. Moreover, [Ezazi et al. \(2011\)](#) studied the impact of ownership structure on stock price volatility for firms listed in the Tehran Stock Exchange. They measured ownership structure in terms of five aspects: institutional ownership, individual ownership, internal ownership, percentage owned by the greatest shareholder, and percentage owned by the greatest five shareholders. The findings of their study showed that the percentage of ownership by the greatest shareholder had a significant positive impact on stock price volatility, whereas the percentage of ownership of individual shareholders had a significant negative impact.

[Alzeaiden and Al-Rawash \(2014\)](#) studied the impact of ownership structure on stock price volatility of companies listed on the Amman Stock Exchange in Jordan. Ownership structure included the largest shareholder, five greatest shareholders, institutional shareholders, and individual shareholders. The results showed that the largest shareholder and the five greatest shareholders had a significant positive influence on stock price volatility. Also in Jordan, [Alawin \(2014\)](#) investigated the impact of ownership structure measured in terms of the percentage of ownership by top owners, percentage of ownership by foreigners, percentage of ownership by individuals, and percentage of ownership by institutions on

stock price volatility for firms listed in the Amman stock exchange, where it was found that the percentage of ownership by top owners showed a significant positive impact on volatility.

Machado et al. (2021) examined the impact of internal and external CG mechanisms on stock market volatility in Brazil, in addition to the moderating impact of GDP on the relationship between CG mechanisms and stock market volatility for companies listed on B3 SA Brasil Bolsa Balcao. The internal CG mechanisms included ownership and control structure, as well as the number of members of the administrative and fiscal council. The findings of the study show that internal mechanisms have a significant influence on stock market volatility only when analyzed with variation in GDP.

In Vietnam, Vo (2015) examined the impact of foreign ownership on the firm-level volatility of stock returns for companies listed on the Ho Chi Minh City stock exchange, where the findings showed that foreign ownership decreases the stock price volatility of firms. Moreover, Thanatawee (2021) studied the impact of foreign ownership on stock price volatility of non-financial firms in Thailand; the findings showed a significant negative relationship between foreign ownership and stock price volatility, suggesting that foreign ownership can be used as a mechanism for mitigating share price volatility.

After examining several studies that dealt with the impact of internal CG on stock price volatility, while placing great emphasis on studies applied in developing nations, the following conclusion has been reached: concerning developing nations, some studies showed a negative relationship, others revealed a positive relationship, and very limited studies found no relationship between internal CG mechanisms and stock price volatility.

Despite having similarities, developing nations are not identical. In fact, differences do exist between various emerging economies located in Eastern Europe, China, the Middle East, and Africa. While CG codes might be quite similar, countries might differ when it comes to their disclosure practices and the content of disclosure (Bhuiyan and Biswas 2007; Samaha et al. 2012).

Therefore, given the unique characteristics and nature of the Egyptian market and the findings of past studies, where many suggest a negative influence for internal CG practices on volatility, and in light of agency theory, the following main hypotheses have been formulated:

H1. *There is a significant negative relationship ownership structure and stock price volatility.*

The first main hypothesis will be further subdivided into three sub-hypotheses:

H1.1. *There is a significant negative relationship between board ownership and stock price volatility.*

H1.2. *There is a significant negative relationship between ownership by the greatest shareholder and stock price volatility.*

H1.3. *There is a significant negative relationship between ownership concentration and stock price volatility.*

H2. *There is a significant negative relationship between board structure and stock price volatility.*

The second main hypothesis will be further subdivided into five sub-hypotheses:

H2.1. *There is a significant negative relationship between board size and stock price volatility.*

H2.2. *There is a significant negative relationship between frequency of board meetings and stock price volatility.*

H2.3. *There is a significant negative relationship between board independence and stock price volatility.*

H2.4. *There is a significant negative relationship between CEO duality and stock price volatility.*

H2.5. *There is a significant negative relationship between women representation and stock price volatility.*

3. Methods

3.1. Data

The study sample comprises 69 non-financial firms that are listed in the EGX for a 7-year period from 2016 to 2022. The study period is justified by the flotation of the Egyptian pound in 2016 and its considerable impact on the Egyptian market, in addition to the release of the third issue of the ECCG by the EIoD in the same year, which is expected to have a substantial influence on the listed firms. Several firms were excluded due to some reasons including financial firms, firms that were de-listed from the exchange, firms that did not distribute any dividend during the study period, in addition to firms that present their financial statements on the 30th of June. Financial firms were ruled out as they have a different nature, their financial statements are structured differently, and furthermore, they tend to be differently regulated with respect to their capital adequacy requirements. A list of the firms examined in the study as well as their industry representation are provided in the Appendix A in Tables A1 and A2, respectively. The study relies on secondary data that were collected from financial statements, historical share prices, disclosure reports, shareholder structure reports, and board of directors' reports that were all obtained from the database of EGID, a subsidiary company fully owned by the EGX.

3.2. Empirical Model

Due to the large number of variables of internal CG practices, it was difficult to include them all in one model, or else this model would lose its purpose. Accordingly, the study will test the impact of CG practices on stock price volatility using two different models. The first model will test the relationship between ownership structure and share price volatility. Based on the literature and proposed hypotheses, the following empirical model has been developed:

$$SPV_{it} = \alpha_0 + \alpha_1 BO_{it} + \alpha_2 GS_{it} + \alpha_3 OC_{it} + \alpha_4 SIZE_{it} + \alpha_5 AGE_{it} + \alpha_6 ROA_{it} + \alpha_7 GROWTH_{it} + \alpha_8 LEV_{it} + \alpha_9 EVOL_{it} + \sum_{i=1}^N firms + \sum_{t=1}^n years + \varepsilon_t \quad (1)$$

where (SPV_{it}) represents the dependent variable, stock price volatility of firm i at time t , where ($t = 1, 2, \dots, n$), α_0 represents the function constant. The independent variables, representing ownership structure, include board ownership (BO_{it}), percentage owned by greatest shareholder (GS_{it}), and ownership concentration (OC_{it}) for firm i at time t . As for the control variables, they include firm size ($SIZE_{it}$), firm age (AGE_{it}), return on assets (ROA_{it}), asset growth ($GROWTH_{it}$), leverage (LEV_{it}), and earnings volatility ($EVOL_{it}$). In addition to that, a vector of firm-specific fixed effects ($\sum_{i=1}^N firms$) and time ($\sum_{t=1}^n years$). Finally, ε_t represents the error term.

The second empirical model will test the relationship between board structure and stock price volatility and it is structured similarly to the first model, as illustrated below:

$$SPV_{it} = \beta_0 + \beta_1 BS_{it} + \beta_2 FM_{it} + \beta_3 BI_{it} + \beta_4 CEO_{it} + \beta_5 WR_{it} + \beta_6 SIZE_{it} + \beta_7 AGE_{it} + \beta_8 ROA_{it} + \beta_9 + \beta_{10} LEV_{it} + \beta_{11} EVOL_{it} + \sum_{i=1}^N firms + \sum_{t=1}^n years + \varepsilon_t \quad (2)$$

In the model above, the independent variables representing board structure of firm i at time t , include board size (BS_{it}), frequency of meetings (FM_{it}), board independence (BI_{it}), CEO duality (CEO_{it}), and women representation (WR_{it}).

In theory, improved CG practices can reduce agency costs caused by the conflict of interest between managers and shareholders, as best practices of internal governance would better align the interests of managers with those of shareholders, and thus contribute to a lower stock price volatility. Therefore, coefficients (α_1), (α_2), (α_3) in model (1), and coefficients (β_1), (β_2), (β_3), (β_4), (β_5) in model (2) are expected to have a negative sign.

3.3. Variables

3.3.1. Dependent Variable

The dependent variable is stock price volatility, which refers to the extent of variability and uncertainty in the prediction of changes in stock prices, where a high price volatility indicates that stock prices can be extended to cover a wide range of values and are vulnerable to dramatic changes within a short time period in any direction (Al-Shawawreh 2014). Based on the work of Baskin (1989), which laid the groundwork for many studies (e.g., Rashid and Rahman 2008; Nazir et al. 2012; Hussainey et al. 2011; Hashemijoo et al. 2012; Al-Shawawreh 2014; Provaty and Siddique 2021), stock price volatility can be measured as follows: the annual range of extreme share prices (the difference between the highest and the lowest annual prices) divided by their mean (the average of the highest and lowest prices) and raised to the power of two. Then a square root transformation is applied as follows:

$$SPV_{it} = \sqrt{\frac{HP_{it} - LP_{it}}{\left[\frac{HP_{it} + LP_{it}}{2}\right]^2}} \quad (3)$$

where (SPV_{it}) denotes the stock price volatility of firm i in period t . As for (HP_{it}) and (LP_{it}), they indicate the highest and lowest share prices of firm i in period t , respectively. According to Hussainey et al. (2011), the use of the abovementioned SPV proxy is expected to add significant value given that standard deviation is generally affected by outliers.

3.3.2. Independent Variables

The first independent variable is ownership structure, measured in terms of the following dimensions:

- (1) **Board ownership:** the percentage of the firm's shares owned by the members of the board is used as a proxy for board ownership (Ezazi et al. 2011; Ajukwara et al. 2022).
- (2) **Percentage of the firm owned by the greatest shareholder:** (Ezazi et al. 2011; Alzeaiden and Al-Rawash 2014; Alawin 2014).
- (3) **Ownership concentration:** as stated by Horsthuis (2019), ownership concentration represents the percentage of shares held by individual investors as well as large block shareholders (investors who own at least 5 percent of equity of the firm). In the current paper, it is measured by dividing the number of shares held by the shareholders who own more than 5% of the firm's shares by the total number of shares outstanding.

The second independent variable is board structure, measured in terms of the following dimensions:

- (1) **Board independence:** the percentage of independent or nonaffiliated outside directors on the board of a given firm, i.e., the number of outside directors divided by the board size (Mezhoud et al. 2017; Aloui and Jarboui 2018).
- (2) **CEO duality:** a dummy variable that is equal to 1 if the CEO is also the chairman of the board, and 0 otherwise (Mezhoud et al. 2017; Aloui and Jarboui 2018).
- (3) **Board size:** the natural logarithm of the number of directors on the board of each firm (Isshaq et al. 2009).
- (4) **Frequency of board meetings:** the natural logarithm of the number of board meetings that are held per year (Ajukwara et al. 2022; Ntim and Osei 2011).
- (5) **Women representation in the board:** the percentage of women directors on the board of a given company, i.e., the number of women directors divided by the board size (Jane Lenard et al. 2014; Jizi and Nehme 2017; Valls Martínez and Soriano Román 2022).

3.3.3. Control Variables

The study controls for earnings volatility, asset growth, leverage, firm size, firm performance, and firm age. Table 1 provides a summary for all the variables included in the study.

Table 1. Measurement of variables.

Type	Name	Abbreviation	Measurement
Dependent variable	Stock price volatility	SPV_{it}	The annual range of extreme stock prices, divided by their mean raised to the power of two, then square root transformation is applied.
Independent variables	Ownership structure	OS_{it}	Measured in terms of 3 dimensions: board ownership, percentage of the firm owned by the greatest shareholder, and ownership concentration.
	Board structure	BS_{it}	Measured in terms of 5 dimensions: board independence, CEO duality, board size, frequency of board meetings, and women representation in the board.
Control variables	Earnings volatility	$EVOL_{it}$	Standard deviation of net earnings.
	Asset growth	$GROWTH_{it}$	Ratio of the change in total assets at the end of the year to total assets at the beginning of the year.
	Leverage	LEV_{it}	Total debt ratio
	Firm size	$SIZE_{it}$	Natural logarithm of total assets.
	Firm performance	ROA_{it}	Net income divided by total assets.
	Firm age	AGE_{it}	Natural logarithm of the number of years of being listed on the EGX.

4. Results and Discussion

4.1. Descriptive Statistics

To identify the nature and characteristics of the variables included in the study, appropriate descriptive statistics are generated, including the mean, median, standard deviation, the minimum and maximum, as well as the normality test. The outcomes for the descriptive statistics for all the variables are provided in Table 2.

Table 2. Descriptive summary statistics, 2016–2022.

	Obs.	Mean	Median	Std. Dev.	Min	Max	Normality Test
Dependent Variable: Stock price volatility (SPV)	444	0.279	0.2415	0.165	0	1.605	[2069.0] ^a
Independent Variable: (a) Ownership Structure							
Board ownership (BO)	444	11.58	0.272	19.76	0	89.12	[474.67] ^a
Greatest shareholder (GS)	444	39.66	34.08	22.37	8.375	98	[49.836] ^a
Ownership concentration (OC)	444	65.89	67.05	17.77	10.79	98	[12.113] ^a
(b) Board Structure							
Board size (BS)	415	2.156	2.197	0.326	1.099	2.833	[22.339] ^a
Frequency of meetings (FM)	415	2.044	1.946	0.486	0	3.332	[0.3496]
Board independence (BI)	415	0.151	0.154	0.146	0	0.574	[27.273] ^a
CEO duality (CEO)	415	0.448	0	0.498	0	1	[69.199] ^a
Women representation (WR)	415	0.12	0.1	0.123	0	0.67	[81.793] ^a
Control Variables:							
Firm size (SIZE)	444	20.95	21.12	1.667	17.2	25.39	[2.8957]
Firm age (AGE)	444	2.873	3.045	0.592	0	3.689	[802.31] ^a
Return on assets (ROA)	444	0.061	0.057	0.086	−0.308	0.522	[283.91] ^a
Asset growth (GROWTH)	444	0.124	0.085	0.23	−0.901	1.369	[1145.1] ^a
Leverage (LEV)	444	0.414	0.432	0.229	0.001	1.171	[8.0202] ^b
Earnings volatility (EVOL)	444	17.36	17.32	1.779	12.27	21.75	[1.9532]

Note: a, b, and c indicate significance at 1%, 5%, and 10%, respectively.

It can be observed from the results in Table 2 that the difference between the minimum and maximum values for all variables is large. Such variance is expected given the differences in firms' structures, characteristics, internal and external conditions, experiences, and the sectors to which they belong. This discrepancy is confirmed by the normality test, which was statistically significant for all the variables (except for the frequency of meetings, earnings volatility, and firm size), indicating that they do not follow a normal distribution.

As illustrated in Table 2, the average stock price volatility is 0.279 and its standard deviation is 0.165. Concerning the dimensions of ownership structure, the average level of ownership concentration is 65.9%, compared to 39.7% for ownership by greatest shareholder, and 11.58% for board ownership. Regarding the board structure dimensions, the average board size is 2.156, the average frequency of meetings is 2.044, the average proportion of independent directors is 0.151, the average CEO duality is 0.448, and the average proportion of women representation is 0.12.

4.2. Correlation Analysis

To provide an initial verification for the hypothesized relationships, a bivariate correlation analysis is conducted. Table 3 demonstrates the outcomes of the zero-order correlation between all the study variables.

Table 3. Correlation matrix between study variables, 2016–2022.

		−1	−2	−3	−4	−5	−6	−7	−8	−9	−10	−11	−12	−13	−14	−15
SPV	−1	1														
BO	−2	0.038	1													
GS	(3)	−0.112 _b	−0.251 _a	1												
OC	(4)	−0.259 _a	−0.125 _a	0.648 _a	1											
BS	(5)	−0.139 _a	0.056	−0.042	0.120 _b	1										
FM	(6)	−0.195 _a	−0.239 _a	0.146 _a	0.157 _a	0.152 _a	1									
BI	−7	0.176 _a	0.087 _c	0.042	−0.097 _b	0.007	−0.022	1								
CEO	−8	0.013	0.01	0.047	0.017	0.107 _b	0.033	−0.011	1							
WR	−9	0.008	0.019	−0.032	−0.064	0.005	0.067	0.120 _b	−0.094 _c	1						
SIZE	(10)	−0.165 _a	0.203 _a	0.259 _a	0.227 _a	0.415 _a	0.310 _a	0.149 _a	0.122 _b	−0.065	1					
AGE	−11	−0.082 _c	−0.059	0.144 _a	0.022	0.041	−0.067	−0.228 _a	0.099 _b	0.068	−0.138 _a	1				
ROA	−12	0.186 _a	0.154 _a	−0.087 _c	−0.003	0.121 _b	0.205 _a	−0.046	0.083 _c	−0.064	0.084 _c	−0.149 _a	1			
GROWTH	(13)	−0.160 _a	0.069	0.001	0.047	0.001	0.067	−0.065	0.039	−0.036	0.116 _b	−0.042	0.228 _a	1		
LEV	(14)	−0.253 _a	−0.078 _c	0.237 _a	0.255 _a	−0.079	0.057	0.233	0.003	−0.019	0.308 _a	0.006	−0.208 _a	0.258 _a	1	
EVOL	(15)	−0.095 _b	0.152 _a	0.148 _a	0.165 _a	0.479 _a	0.289 _a	0.199 _a	0.126 _a	−0.155 _a	0.892 _a	−0.164 _a	0.131 _a	−0.015	0.216 _a	1

Note: a, b, and c indicate significance at 1%, 5%, and 10%, respectively.

As shown in Table 3, there is an inverse correlation between all the internal CG mechanisms and stock price volatility (except for board independence). This implies that increasing firms' abidance by the CG code will be accompanied with a decrease in the level of stock price volatility, thus providing an initial indication of a negative impact for internal CG practices on share price volatility.

Furthermore, as shown by the outcomes in Table 3, the dimension of ownership structure that has the highest correlation with stock price volatility is ownership concentration (−25.9%), significant at the 1% level, followed by the percentage of ownership by greatest shareholder (−11.2%), significant at 5%, and finally, board ownership (−3.8%), which is not statistically significant. Concerning the dimensions for board structure, the frequency of board meetings has the highest correlation with stock price volatility (−19.5%), followed by board independence (17.6%), then board size (−13.9%); all are statistically significant at the 1% level. Finally, both CEO duality and women representation show insignificant inverse

correlations. Regarding the control variables, leverage has the highest correlation with stock price volatility with a correlation coefficient (−25.3%), followed by ROA (18.6%), firm size (−16.5%), asset growth (−16%), earnings volatility (−9.5%), and firm age (−8.2%).

Also, the outcomes in Table 3 show that the correlation coefficients among the independent variables ranged from weak to moderate. According to Anderson et al. (2017), correlation coefficients higher than 0.7 can indicate that the model may be subject to the problem of multicollinearity. Therefore, multicollinearity among the variables does not seem to exist, with the exception of one strong correlation between firm size and earnings volatility (89.2%), implying that a larger firm size will be accompanied with increased earnings volatility. This calls for attention while running the regression in order to make sure that this problem is neutralized and does not affect the results.

4.3. Regression Analysis

4.3.1. Estimation Method

As a result of relying on a large sample of firms that vary greatly in terms of their stock price volatility or their internal CG practices, the problem of individual differences or individual effects for each firm may arise when implementing the analysis. This was confirmed by the results of the Robust test for differing group intercepts, the results of which are provided in Table 4 and Table 6. The calculated F value was significant at 1%, thus the rejection of the null hypothesis that firms have the same fixed part, and the acceptance of the alternative hypothesis that firms do not have the same fixed part, implying the existence of individual effects for each firm.

Table 4. Ownership structure and stock price volatility: econometrics results.

Dependent variable: Stock Price Volatility (SPV)				
Expected Sign	Two-way fixed effects model		One-step dynamic panel data	Panel weighted least squares
	Reg (1)	Reg (2)	Reg (3)	
SPV(−1)		0.75364 [12.06] ***		
Board ownership	(−)	0.00058 [1.489]	-4.66×10^{-5} [−0.211]	−0.00063 [−3.136] ***
Greatest shareholder	(+)	0.00126 [1.524]	0.00262 [3.063] ***	0.00495 [6.659] ***
Greatest shareholder squared	(−)	-1.10×10^{-5} [−1.064]	-1.74×10^{-5} [−2.171] **	-3.73×10^{-5} [−5.148] ***
Ownership concentration	(−)	−0.00129 [−8.409] ***	−0.00232 [−7.315] ***	−0.00315 [−11.65] ***
Firm size		0.02326 [2.178] **	−0.02130 [−2.410] **	−0.02496 [−4.575] ***
Firm age		−0.03861 [−3.021] ***	−0.02130 [−2.570] **	−0.03154 [−4.226] ***
Return on assets		−0.11729 [−4.580] ***	−0.16387 [−2933] ***	−0.22008 [−4.414] ***
Asset growth		−0.02608 [−4.440] ***	−0.01647 [−0.786]	−0.01385 [−0.751]
Leverage		−0.12938 [−3.359] ***	−0.06594 [−3.007] ***	−0.14217 [−7.181] ***
Earnings volatility		0.00668 [2.304] **	0.00894 [1.682] *	0.01654 [3.472] ***
Constant		−0.09805 [−0.530]	0.42791 [5.443] ***	0.75556 [11.76] ***
Key Regression Statistics				
Obs.	444	375	444	
Unit (Firms)	69	67	69	
Adjusted R-squared	87.9%		47.01%	
Fisher test (F-stats.)	(38.718) ***		(24.121) ***	
Residual variance test (F-stats.)	(19.179) ***			
Breusch–Pagan test (χ^2 stats.)	(500.60) ***			
Hausman test (χ^2 stats.)	(40.941) ***			
Time test (χ^2 stats.)	(43.348) ***	(152.05) ***		
Test for AR(1) errors (z-stats.)		(−7.872) ***		
Test for AR(2) errors (z-stats.)		(−0.363)		
Sargan over-identification (χ^2 stats.)		(197.69) ***		
Wald (joint) test (χ^2 stats.)		(570.58) ***		
Number of instruments		36		
Practical significance for Ownership Structure: Effect Size (Cohen's d)				
Board ownership	0.1576 [No effect]	−0.0223 [No effect]	−0.3042 [Small effect]	
Greatest shareholder	−0.1126 [No effect]	−0.2298 [Small effect]	−0.4994 [Small effect]	
Ownership concentration	−0.8901 [Large effect]	−0.7743 [Intermediate]	−1.1302 [Large effect]	

Note: ***, **, * indicate significance at 1%, 5%, and 10%, respectively. t-statistic in parentheses.

Moreover, this was confirmed by the (residual variance) and (Breusch–Pagan) tests that showed that either the fixed effects or random effects model would be better than the pooled least squares. To determine which model is more suitable to be used, the Hausman test was conducted, and its result was statistically significant for the two regression models, indicating that the fixed effects model is more appropriate for the current study than the random effects. The result of the (Time) test was also statistically significant for both regression models, indicating that time does affect the relationship. Consequently, based on the results of the diagnostics tests, the most suitable measurement method for the data would be the two-way fixed effects method (2-way FEM), which deals with individual effects by adding dummy variables for each firm and each year.

The fixed effects model is a highly appropriate model for a study applied on a large number of dissimilar firms, as in the current study. It allows the y-intercept to vary according to firms, thereby taking into account the individual differences for each firm when applying the analysis. However, it is still assumed that the slope coefficients are constant for each firm, as shown in the following equation:

$$Y_{it} = \beta_{1i} + \beta_2 X_{2it} + \dots + u_{it}$$

The subscript i is added to the y-intercept to express the possibility that it can differ from one firm to another, where such differences can be due to characteristics specific to each firm, including its size and experience in the market. Thus, the term “fixed effects” refers to the fact that even though the y-intercept varies among observations, it does not vary with time. However, since the time test showed that time affects the regression as mentioned earlier, then the appropriate methodology for the study is the two-way fixed effects model (2-way FEM), where the y-intercept changes according to firms and time, as illustrated in the following equation:

$$Y_{it} = \beta_{1it} + \beta_2 X_{2it} + \dots + u_{it}$$

In order to rely on a highly appropriate method that would allow for individual differences or heterogeneity among firms, and generate reliable results, the fixed and random effects models were considered, being highly popular methodologies for dealing with individual differences. The choice between both methods was made objectively as previously discussed. However, it is quite possible that the dependent variable is dynamic; the independent variables are not strictly exogenous, i.e., they are correlated with the past and possibly the present error; in addition to heteroskedasticity and autocorrelation within errors of units (firms), not across these units. Given these possibilities, major difficulties may arise in using the fixed effects model in the context of dynamic models, as the dominant process that generates the average value of the dependent variable for each independent variable can result in a relationship between the explanatory variables and the random error; hence, the results may become more biased (Nickell 1981).

Consequently, it was necessary to support the results by relying on additional statistical techniques that can address these issues while allowing for individual differences. Hence, a highly reliable methodology for this is the dynamic panel data (DPD) model developed by Arellano and Bond (1991). It is considered more appropriate for the panel data of the study which are characterized by a few periods and large number of firms. This approach takes the first difference of the original model to remove heterogeneity among firms while introducing a set of instrumental variables (that is, based on the lagged values of the dependent variable) which would be highly correlated with the dependent variable, but uncorrelated with the composite error process. Accordingly, the first difference of the equation eliminates u_i , which represents the unobserved individual effects, and the associated problem of omitted variable bias (Arellano 2003).

Relying on the dynamic panel data (DPD) model in the current study would enhance the robustness of the findings as it is highly effective in dealing with unobserved heterogeneity (variation among individual observations that is not observed) and endogeneity

(correlation between an explanatory variable and the error term). The assumptions of this model include sequential exogeneity (meaning that explanatory variables are not correlated with future error terms), and the absence of autocorrelation between the error terms.

A highly common approach is to infer the coefficients using a heteroscedastic linear model on an ordinary least squares (OLS) estimator, while using heteroskedasticity-consistent standard errors, which was already applied with the fixed effects model. Nevertheless, it was also decided to use weighted least squares (WLS) for longitudinal data for two reasons. First, heteroskedasticity-consistent standard errors can also be employed to establish a valid inference on the WLS estimator and using such estimator can provide substantial gains in efficiency, compared to the OLS estimator (DiCiccio et al. 2019). In addition to the desire to allow more important units of the panel data to have a greater role in the estimator.

The panel weighted least squares (PWLS) model represents a generalization of the ordinary least squares (OLS) and linear regression, where the identification of unequal variance of the study observations is integrated into the regression, and this approach is effective against the heteroscedasticity problem.

4.3.2. Regression Results

Prior to running the regression, it is essential to guarantee its quality and that it is free from several measurement problems in order to ensure the reliability of the results. Diagnostic tests revealed the existence of heteroscedasticity as well as serial correlation between the residuals, and also, the residuals do not follow normal distribution, all of which are anticipated measurement problems, when having a large sample of heterogeneous firms. To overcome such problems, the (2-way FEM) method was estimated using the white cross-section standard errors and firm GLS weights commands, which are highly effective in eliminating heteroscedasticity and serial correlation between residuals. Concerning the DPD method, it is designed to deal with heteroscedasticity and autocorrelation within individual unit errors as already mentioned and it is estimated using the asymptotic standard errors command.

Additionally, non-normality does not seem to create a problem, because with a large sample size, OLS estimators would generally approximate a normal distribution. Hence, in large samples, as in this paper, statistical inference will follow the normal OLS method, which assumes a normal distribution. Consequently, the estimates resulting from the methods of measurement used are highly efficient and reliable.

Results of the Impact of Ownership Structure on Stock Price Volatility

Table 4 displays the results for the regression models examining the impact of the three ownership structure dimensions on stock volatility. The relationship is estimated using the (2-way FEM) technique in regression (1), the (1-step DPD) technique in regression (2), and the (PWLS) technique in regression (3). As the results of the three regressions are compared, it is observed that there is a negative effect for ownership concentration on stock price volatility, significant at the 1% level, and this result is consistent in all three regressions. Such result is consistent with the correlation matrix, which showed a statistically significant inverse correlation at the 1% level between the two variables. According to the regression coefficient, increasing ownership concentration by 1 percent will lead to a decrease in stock price volatility by an amount ranging from 0.0013 to 0.0032 degrees on average.

Regarding the percentage of ownership by greatest shareholder, the results of regressions (2) and (3) in Table 4 showed a non-linear relationship between the percentage of ownership by greatest shareholder and stock price volatility. This relationship has an inverted U shape, implying that a low percentage of ownership by greatest shareholder positively influences stock price volatility, but this effect becomes negative when the percentage of ownership by greatest shareholder is high. In other words, a low percentage of ownership by the greatest shareholder increases stock price volatility, while a high percentage decreases it. Nevertheless, regression (1) did not confirm such non-linear relationship.

To corroborate this non-linear relationship in regressions (2) and (3). The Sasabuchi–Lind–Mehlum test was applied as shown in Table 5. The test statistic was not statistically significant, hence, the acceptance of the null hypothesis of the existence of an inverted U-shaped relationship. Additionally, the inflection point came within the limits of the actual data, which is equivalent to 75.5%, indicating that the inverted U-shaped relationship does exist. Consequently, the effect of ownership by the largest shareholders can be explained as follows: percentages of ownership below 75.5% have a positive impact on stock price volatility, but such impact turns negative when the percentage of ownership exceeds the 75.5% limit.

Table 5. Sasabuchi–Lind–Mehlum test for an inverse U-shaped relationship.

Variable	X_i	X_i^2	Interval		Slope at X_l	Slope at X_h	Sasabuchi Test	Extremum Point
	$\hat{\beta}$	$\hat{\gamma}$	$X_{l(min)}$	$X_{h(max)}$	$\hat{\beta} + 2\hat{\gamma}X_l$	$\hat{\beta} + 2\hat{\gamma}X_h$	(t-Value)	$-\hat{\beta}/(2\hat{\gamma})$
<i>Greatest shareholder</i>	0.00262 [3.063] ***	-1.74×10^{-5} [−2.171] **	8.3749	98.004	0.00233	−0.00078	[0.963]	75.4605
Extremum inside interval								

Note: ***, indicate significance at 1% and ** indicate significance at 5%.

As for board ownership, the results of the different estimation methodologies are not consistent, which indicates that the impact of board ownership on stock price volatility varies based on the employed estimation technique. As depicted by regressions (1) and (2) in Table 4, board ownership has no effect on stock price volatility using the (2-way FEM) and the (1-step DPD) techniques. Conversely, regression (3) showed a negative effect for board ownership using the (PWLS) technique.

Regarding the control variables, the results for the three regressions in Table 4 confirmed a negative impact for firm age, ROA, and financial leverage on stock price volatility. On the other hand, the results for earnings volatility supported a positive impact on stock price volatility. As for firm size and asset growth, their results were inconsistent. Finally, with regard to the lagged value of stock price volatility tested in regression (2), it can be observed that there is a positive impact of stock price volatility from the previous year on the volatility of the current year, implying that fluctuations are short term, caused by speculative operations to generate profits.

Regarding the general statistics, the value of the adjusted coefficient of determination (Adjusted R^2) for regression (1) indicates that the study model explains 87.9% of the changes in stock price volatility, and the rest is due to other variables that are not controlled for in the study. Also, the Fisher test indicates the rejection of the null hypothesis and the acceptance of the alternative hypothesis that the first model is statistically significant at the 1% level.

The results of the diagnostic tests for regression (2) also indicate the significance of the AR(1) errors test at the 1% level, which means the rejection of the null hypothesis that there is no first-order autocorrelation, and the acceptance of the alternative hypothesis of the existence of AR(1). However, this does not represent a serious threat to the validity of the model, unlike the second-order autocorrelation AR(2), which violates the statistical assumptions of the estimation methodology. Moreover, Sargan's over-specification test indicates that the instruments used are valid, and the Wald test indicates the joint significance of the explanatory variables collectively at the 1% level.

For a more thorough analysis, the effect size is used, where it provides a quantitative measure of the size of the association between the variables. It provides an assessment of the strength of the results which is not solely provided by statistical significance tests. So, it demonstrates the extent of the practical significance of the relationship in actual reality. Thus, the effect size provides additional information for the inferential decision of whether to accept or reject the null hypothesis.

The effect size is calculated from the partial correlations between ownership structure variables and stock price volatility, which measure the correlation between the dependent

and independent variables while controlling for the other variables in the model (under the assumption that they also affect the dependent variable). The Cohen (1988) statistic in Table 4 shows that there is an intermediate to large effect size for ownership concentration in reducing the volatility of the stock prices. On the other hand, the percentage of ownership by greatest shareholder and board ownership have an effect size that ranges from small to none. These results imply that out of the three tested ownership structure dimensions, ownership concentration has the greatest practical significance in reducing the volatility of share prices of Egyptian firms. This provides huge support for developing theory and formulating policies to control volatility through ownership concentration.

Results of the Impact of Board Structure on Stock Price Volatility

Table 6 shows the results of the regression models testing the hypotheses related to the impact of the five dimensions of board structure on the volatility of stock prices. The relationship is estimated using the (2-way FEM) technique in regression (4), the (1-step DPD) in regression (5), and the (PWLS) in regression (6). After comparing the results of the board structure variables in the three regression models, a negative effect was observed for board size and frequency of meetings on share price volatility at the 1% level, and this result is consistent in the three regressions. Such result is also consistent with the correlation matrix, which indicated a statistically significant inverse correlation at the 1% level for both the board size and the frequency of meetings with stock price volatility. According to the regression coefficients, increasing board size by one unit will cause a decline in stock price volatility by an amount ranging from 0.034 to 0.049 degrees on average. Similarly, the results in Table 6 also show that increasing the frequency of meetings by one unit leads to a decline in stock price volatility by an amount ranging from 0.029 to 0.052 degrees on average.

Additionally, the three regressions showed a positive effect for board independence on stock price volatility at the 1% level. According to the results, increasing board independence by one percent will lead to an increase in stock price volatility by an amount ranging from 0.113 to 0.151 degrees on average. Finally, the results of the three regressions in Table 6 indicate that CEO duality and women representation have no effect on stock price volatility.

Concerning the control variables in Table 6, results are similar to the ones provided in Table 4. Additionally, the second model of the study explains 88.4% of the changes in stock price volatility, as illustrated by the adjusted R-squared. Finally, it can be observed from the Cohen (1988) statistic in Table 6 that there is a small effect size for both board size and frequency of board meetings in reducing the volatility of stock prices. Additionally, the effect size for board independence ranged from small to intermediate, whereas the CEO duality and women representation had no effect size. This indicates that there is a slight practical significance for board size, frequency of board meetings, and board independence in reducing the volatility of share prices; while CEO duality and women representation have no practical significance. These results encourage developing theory and formulating policies to control stock price volatility through board size, board independence, and the frequency of board meetings.

Table 6. Board structure and stock price volatility: econometrics results.

Dependent variables: Stock Price Volatility (SPV)				
	Expected Sign	Two-way fixed effects model	One-step dynamic panel data	Panel weighted least squares
		Reg (4)	Reg (5)	Reg (6)
SPV (−1)			0.53089 [10.34] ***	
Board size	(−)	−0.03865 [−2.618] ***	−0.03397 [−2.001] **	−0.04909 [−2.986] ***
Frequency of meetings	(−)	−0.05155 [−4.204] ***	−0.03449 [−3.368] ***	−0.02872 [−3.035] ***
Board independence	(−)	0.11272 [3.144] ***	0.15149 [4.647] ***	0.11514 [3.833] ***
CEO duality	(−)	−0.00117 [−0.256]	−0.00216 [−0.241]	0.03353 [3.634] ***
Women representation	(−)	0.00721 [0.225]	−0.05054 [−1.265]	−0.00104 [−0.023]
Firm size		0.01397 [1.701] *	−0.01365 [−2.128] **	−0.02794 [−4.299] ***
Firm age		−0.05331 [−2.468] **	−0.01765 [−1.866] *	−0.02766 [−2.961] ***
Return on assets		−0.16298 [−4.655] ***	−0.20598 [−3.405] ***	−0.27246 [−4.920] ***
Asset growth		−0.02046 [−2.148] **	0.00474 [0.203]	−0.01770 [−0.799]
Leverage		−0.18607 [−4.456] ***	−0.11101 [−4.487] ***	−0.17111 [−7.256] ***
Earnings volatility		0.01080 [3.379] ***	0.01101 [1.705] *	0.02170 [3.197] ***
Constant		0.21751 [1.238]	0.43783 [5.335] ***	0.77190 [11.95] ***
Key Regression Statistics				
Obs.		415	350	415
Unit (Firms)		67	64	67
Adjusted R-squared		88.4%		35.7%
Fisher test (F-stats.)		(38.383) ***		(13.796) ***
Residual variance test (F-stats.)		(18.432) ***		
Breusch–Pagan test (χ^2 stats.)		(489.63) ***		
Hausman test (χ^2 stats.)		(27.879) ***		
Time test (χ^2 stats.)		(40.677) ***	(117.42) ***	
Test for AR(1) errors (z-stats.)			(−7.872) ***	
Test for AR(2) errors (z-stats.)			(−0.363)	
Sargan over-identification (χ^2 stats.)			(169.11) ***	
Wald (joint) test (χ^2 stats.)			(489.51) ***	
Number of instruments			37	
Practical significance for Board Structure: Effect Size (Cohen's d)				
Board size		−0.2887 [Small effect]	−0.2200 [Small effect]	−0.3005 [Small effect]
Frequency of meetings		−0.4636 [Small effect]	−0.3702 [Small effect]	−0.3054 [Small effect]
Board independence		0.3136 [Small effect]	0.5108 [Intermediate]	0.3857 [Small effect]
CEO duality		−0.0282 [No effect]	−0.0265 [No effect]	0.3657 [Small effect]
Women representation		0.0248 [No effect]	−0.1391 [No effect]	−0.0023 [No effect]

Note: ***, **, * indicate significance at 1%, 5%, and 10%, respectively. t-statistic in parentheses.

4.3.3. Discussion

With respect to ownership structure dimensions, the negative influence of ownership concentration on stock price volatility contradicts the findings of [Alzeaiden and Al-Rawash \(2014\)](#), which supported a positive impact for ownership concentration. This negative influence can be interpreted in terms of the notion that if ownership is highly disseminated among a large number of shareholders, with each holding few shares, they are much less likely to care about monitoring managers' activities, leaving the door open for the occurrence of conflict of interest between managers and shareholders, violations by managers, and hence higher volatility levels. However, if shareholders own a considerable portion of the firm's shares, then they may have a stronger motive to monitor and supervise managers' activities and ensure that managers' objectives are aligned with theirs. Additionally, if managers realize that a huge portion of outstanding shares is held by block holders, they would be reluctant to engage in violations in the first place, which leads to less volatility. The negative influence of ownership concentration on volatility may suggest that ownership concentration can act as a control mechanism for reducing the conflict of interest between managers and shareholders in the Egyptian market.

The inverted U-shaped relationship between percentage of ownership by the greatest shareholder and stock price volatility indicates that low percentage of ownership increases stock price volatility, while a high percentage of ownership reduces it. Such finding can be justified as follows: the greatest shareholder may naturally be more inclined to serve

their own interests at the expense of minority shareholders and can even rely on other shareholders to pay for the monitoring and supervision of managers, then a Type II agency problem would arise, which may result in higher risk. Nonetheless, as the proportion of their ownership in the company becomes substantial, they will have more at stake and are therefore expected to become more concerned about their investments and more likely to engage in monitoring managers' activities and making sure that the firm is performing as planned, then the conflict of interest between managers and shareholders would be reduced, leading to lower risk. This may suggest that despite the highly concentrated ownership that characterizes many firms in the market, the conflict of interest between managers and shareholders may be considered as one of the factors that triggers volatility of share prices in the Egyptian market.

The negative influence of board ownership on stock price volatility was only confirmed by one of the regressions and is consistent with [Ogbeide and Evbayiro-Osagie \(2019\)](#). This negative influence indicates that when board members own more shares, they may have greater incentive to ensure that managers maximize shareholders' wealth, since in doing this, their own wealth would be maximized. Therefore, managers would be prone to more strict supervision by board members and are therefore less likely to engage in violations, leading to a better alignment of interests between managers and shareholders, and then the agency problem would be less pronounced, and volatility levels would be lower.

Concerning the findings for board structure, the negative influence of board size on stock price volatility is consistent with [Mezhoud et al. \(2017\)](#) and contradicts [Ajukwara et al. \(2022\)](#), who found a positive impact. Such negative influence can be justified as larger boards can be more capable of effectively monitoring managers, taking proper actions needed to ensure that managers' activities serve shareholders' interests, and making major decisions necessary to achieve the firm's objectives, hence contributing to a lower volatility level. Additionally, the negative impact of frequency of board meetings on stock price volatility contradicts the findings of [Ajukwara et al. \(2022\)](#), who found a positive impact. This negative effect indicates that the more time the board devotes to addressing important issues related to the firm, the greater the likelihood of improved company performance, better-aligned objectives for managers and shareholders, and lower risk levels. Additionally, if managers are aware that board meetings are frequently held, they would expect their actions to be consistently subject to extensive oversight and supervision by board members. Accordingly, they would continuously have shareholders' interests in mind, leading to lower chances of violations by managers, less conflict of interest, and lower volatility levels.

Moreover, the evidenced positive influence of board independence on volatility contradicts the findings by [Mezhoud et al. \(2017\)](#) and [Ogbeide and Evbayiro-Osagie \(2019\)](#), who reported a negative impact. Such finding challenges the prevailing notion that the more independent the board is, the better the CG, hence the lower the firm risk. Recently, there has been an increased propensity towards more regulation and more strict CG practices. One of the most issues that is highly agreed upon and included by regulators in CG codes is the importance of having more independent directors. This can be attributed to the fact that independent members can better protect shareholder value through the objective and strict monitoring and supervision of management, and are expected to provide valuable advice, expertise, and business contacts. Nevertheless, the dominance of independent directors comes at a cost, as it restricts the role and influence of major shareholders, as non-independent outsiders, in the CG of the firm ([De Andrés et al. 2017](#)). Additionally, having a non-independent or an insider-dominated board can bring along several advantages ([Raheja 2005](#); [Harris and Raviv 2008](#); [Adams and Ferreira 2007](#); [Gutiérrez and Sáez 2013](#); [De Andrés et al. 2017](#)), but such notion needs robust empirical support ([Masulis and Mobbs 2011](#)). Non-independent board members may have more incentive and greater ability to monitor managers more closely. They are usually selected by the largest shareholders, and may also be less busy and more willing to devote their time to the company compared with independent members who might be on the boards of several other companies as well ([Gutiérrez and Sáez 2013](#); [De Andrés et al.](#)

2017). Additionally, due to the fact that the board simultaneously engages in monitoring managers in addition to providing advice, a firm's CEO may experience an important trade-off concerning whether to communicate complete information to the board, and in doing so, he receives more proper and comprehensive advice, but he might also become subjected to increased monitoring and would therefore shy away from communicating complete information. In this case, a non-independent board may be recommended as they can be more accepted by managers and CEOs who may be less hesitant to communicate complete and accurate information to them, compared with their independent counterparts (Adams and Ferreira 2007). Furthermore, non-independent directors can be more aware of the firm's operations, practices, and objectives than independent directors who are usually less informed about the firm than managers, leading to information asymmetry. Finally, they can be more concerned about the firm's success and achievement.

The absence of a significant impact for CEO duality on volatility contradicts the findings of Aloui and Jarboui (2018), who reported a positive impact, and Mezhoud et al. (2017) who found a negative impact. Similarly, women representation is found to have no significant influence on volatility, contradicting the findings of Jane Lenard et al. (2014) and Jizi and Nehme (2017) who reported that female representation on the board can reduce risk.

5. Conclusions and Recommendations

This paper tested the association between internal CG mechanisms and stock price volatility for listed firms in Egypt for the period from 2016 to 2022. Internal CG practices included ownership structure and board structure. Regarding the dimensions of ownership structure, it can be generally concluded that it has a negative impact on stock price volatility. Ownership concentration negatively affects stock price volatility. Interestingly, the percentage of ownership by the greatest shareholder has an inverted U-shaped relationship with stock price volatility, where a low percentage of ownership increases volatility, while a high percentage of ownership reduces it. Such finding is considered unique to the current study. Board ownership has a negative impact on stock price volatility. Regarding board structure, board size and frequency of board meetings have a negative impact on stock price volatility. Conversely, board independence has a positive impact on volatility, which provides robust empirical support to the theoretical arguments suggesting several advantages of a non-independent board. Finally, CEO duality and women representation have no impact on volatility.

It can be concluded from the findings of the study that internal CG mechanisms do influence volatility and can serve as an effective tool for controlling stock price volatility in the Egyptian market. The findings provide important implications for academics, practitioners, investors, and regulators, as well as the overall market. The academic implications include providing a more thorough understanding of the importance of internal CG practices in predicting stock price volatility and how they can play a major role in reducing volatility in the Egyptian market, given the highly concentrated ownership, and in light of the CG practices that are regularly disclosed by Egyptian firms, and the previously discussed characteristics of the Egyptian market. Regarding practical implications, the findings of the study can encourage decision makers to perceive internal CG, not only as a set of practices necessary to comply with the CG code, but also as effective mechanisms that can be employed to control and limit the volatility of share prices and can possibly minimize firms' cost of capital and enable them to finance their investments at a lower cost. Moreover, the findings can enable investors to make more informed investment decisions founded on a better understanding of the risk involved. This may reduce the fear and reluctance of some investors to enter the market, which in turn can contribute to a highly active stock market, resulting in a higher level of investment, protection of minority shareholders' rights, and may help improve the overall state of the economy. Furthermore, as explained by Maher and Andersson (2000), good CG practices can result in a myriad of positive outcomes, including more developed equity markets, higher levels of innovation,

R&D and entrepreneurship, as well as a more active SME sector, which may eventually encourage economic growth. Furthermore, an important implication for regulators is that by improving the overall CG practices, fluctuations in firms' stock prices would be less pronounced, resulting in lower volatility levels, lower level of speculation, and a more stabilized stock market. This may increase the likelihood of success of the economic reforms of the country and its development endeavors, as a more stable stock market would be more attractive to both domestic and foreign investors, leading to a more efficient allocation of capital and possibly contributing to improved economic conditions.

However, the results of the paper should be dealt with carefully, provided the presence of some limitations. While the study is solely focused on internal CG practices, it did not address the potential impact of external practices. Moreover, the findings of the paper cannot be generalized on financial firms as they tend to have a different nature, and their financial statements are structured differently. Finally, even though some past studies argued that some additional ownership and board structure dimensions may also affect volatility, the study is limited by the dimensions disclosed by Egyptian firms.

Consequently, the paper provides several recommendations for future research. Firstly, it is recommended to test the impact of external CG mechanisms on the volatility of share prices in Egypt, to understand how their influence would compare to that of internal mechanisms. Additionally, studying how the impact of CG mechanisms on share price volatility would differ in a pre-flotation versus post-flotation period would add much value by clarifying how currency devaluation or fluctuations in exchange rate would affect the aforementioned relationship. Moreover, it is suggested to conduct a similar study on financial firms in order to determine whether the findings are consistent or contradicting to those of non-financial firms. Furthermore, it is recommended to test the findings of the current study in additional emerging markets, as each emerging market may have its unique characteristics. Finally, after internal CG mechanisms were found to influence stock price volatility in Egypt, it would be plausible to test its impact on cost of capital as well.

Therefore, this research paper not only provides insight into the level of CG practices of Egyptian firms and the impact of such practices on share price volatility, but also paves the way for numerous future studies to follow, whether in Egypt or in other emerging markets.

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Appendix A

Table A1. List of the firms examined in this paper.

ID	Company (Listed on the EGX, Egypt)
1	Egyptian Media Production City
2	Telecom Egypt
3	Arabian Food Industries Co.
4	Cairo poultry

Table A1. Cont.

ID	Company (Listed on the EGX, Egypt)
5	Delta Sugar Co.
6	Edita Food Industries
7	Ismailia Misr Poultry
8	Juhayna Food Industries
9	Mansoura Poultry
10	Obourland for food industries
11	Egyptian Transport & Commercial Services Co. (EGYTRANS)
12	Delta For Printing & Packaging
13	Alexandria New Medical Center
14	Egyptian International Pharmaceutical Industries Company (EIPICO)
15	Minapharm Pharmaceuticals
16	Pyramisa Hotels and Resorts
17	Rowad Tourism
18	Amer Group Holding
19	El Obour for Real Estate Investment
20	Gharbia Islamic Housing Development
21	Gulf Canadian Company for Arab Real Estate Investment
22	Madinet Nasr for Housing and Development
23	Orascom Development Egypt
24	Palm Hills Developments
25	Arab Developers Holding
26	Sixth of October Development and Investment Company (SODIC)
27	United for Housing & Development
28	Al Shams Housing and Urbanization
29	Egypt Gas
30	Acrow Misr
31	Nasr Company for Civil Works
32	Industrial Engineering Company for Construction and Development (ICON)
33	Golden Tex
34	Oriental Weavers
35	Arabian Cement
36	Lecico Egypt
37	Misr Beni Suef Cement
38	Misr Cement Qena
39	The Arab Ceramic Co. (Ceramica Remas)
40	Arab Valves Company
41	Al Ezz Ceramic and Porcelain Co (Gemma)
42	Arab Aluminum Company
43	Al Ezz Dekheila Steel Company—Alexandria
44	Egyptian Financial & Industrial Company
45	Kafr El Zayat Pesticides and Chemicals Company

Table A1. *Cont.*

ID	Company (Listed on the EGX, Egypt)
46	Misr Fertilizers Production Company (Mopco)
47	Egyptian International Tourism Projects
48	Assiut Islamic Trading
49	October Pharma
50	GlaxoSmithKline
51	Sharkia National Food
52	The Egyptian Satellite Company (Nilesat)
53	Talaat Moustafa Group
54	El Ahram Co. For Printing and Packing
55	Modern Shorouk Printing and Packaging
56	Zahraa Maadi Investment & Development
57	Sinai Cement Co.
58	Development and Engineering Consultants Co.
59	Arab Engineering Industries
60	Egyptian Starch & Glucose
61	Suez Cement
62	Nozha International Hospital
63	Elsewedy Electric
64	Sidi Kerir Petrochemicals Co.
65	Raya Holding for Financial Investments
66	El Nasr Transformers & Electrical Products Co. (El Maco)
67	Misr Refrigeration and Air Conditioning Mfg. Co. (Miraco)
68	Suez Bags
69	National Company for Maize Products

Table A2. Sample size and industry representation.

Sectors	No. of Companies	%
(1) Real estate	13	18.8
(2) Food, drinks, and tobacco	11	15.9
(3) Building materials	8	11.6
(4) Industrial materials	7	10.1
(5) Health care and medicines	6	8.7
(6) Basic materials	5	7.2
(7) Basic resources	5	7.2
(8) Communications, media, and information technology	4	5.8
(9) Contracting and engineering construction	3	4.3
(10) Tourism and entertainment	3	4.3
(11) Textiles and durable goods	2	2.9
(12) Facilities	1	1.4
(13) Transportation and shipping services	1	1.4
Total	69	100

References

- Abdel-Meguid, Ahmed. 2021. Corporate governance in Egypt: The landscape, the research, and future directions. *Corporate Ownership and Control* 18: 296–306. [CrossRef]
- Abd-El salam, Omneya Hassan. 1999. The Introduction and Application of International Accounting Standards to Accounting Disclosure Regulations of a Capital Market in a Developing Country. Doctoral dissertation, Heriot-Watt University, Edinburgh, UK.
- Adams, Renée B., and Daniel Ferreira. 2007. A theory of friendly boards. *The Journal of Finance* 62: 217–50. [CrossRef]
- Ajukwara, Ugochukwu I., Emmanuel I. Okoye, and Segun I. Adeniyi. 2022. Board Characteristics and Share Price Volatility of Insurance Companies Listed on Nigerian Exchange Group. *Journal of Global Accounting* 8: 67–78.
- Alawin, Mohammad. 2014. The Impact of Ownership Structure Changes on the Volatility of Market Stock, The Case of Amman Stock Exchange. *Business and Management* 6: 197–216.
- Aloui, Mouna, and Anis Jarbou. 2018. The effects of corporate governance on the stock return volatility: During the financial crisis. *International Journal of Law and Management* 60: 478–95. [CrossRef]
- Aloui, Mouna, and Anis Jarbou. 2019. Does domestic institutional ownership increase return volatility? The French context. *International Journal of Law and Management* 61: 421–33. [CrossRef]
- Al-Shawawreh, Fawaz Khalid. 2014. The impact of dividend policy on share price volatility: Empirical evidence from Jordanian stock market. *European Journal of Business and Management* 6: 133–43.
- Alzeaiden, Khaled Abdulwahab, and Sara Zakaria Al-Rawash. 2014. The effect of ownership structure on share price volatility of listed companies in Amman Stock Exchange. *Research Journal of Finance and Accounting* 5: 192–201.
- Anderson, David Ray, Dennis J. Sweeney, Thomas A. Williams, Jeffrey D. Camm, and James J. Cochran. 2017. *Statistics for Business and Economics, Revised*. Belmont: Cengage Learning.
- Appuhami, Ranjith, and Mohammed Bhuyan. 2015. Examining the influence of corporate governance on intellectual capital efficiency: Evidence from top service firms in Australia. *Managerial Auditing Journal* 30: 347–72. [CrossRef]
- Arellano, Manuel. 2003. *Panel Data Econometrics*. Oxford: OUP Oxford.
- Arellano, Manuel, and Stephen Bond. 1991. Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies* 58: 277–97. [CrossRef]
- Baskin, Jonathan. 1989. Dividend policy and the volatility of common stocks. *Journal of portfolio Management* 15: 19. [CrossRef]
- Bhuiyan, Md Hamid Ullah, and Pallab Kumar Biswas. 2007. Corporate governance and reporting: An empirical study of the listed companies in Bangladesh. *Dhaka University Journal of Business Studies* 28: 1–32. Available online: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=987717 (accessed on 9 March 2024).
- Bremer, Jennifer, and Nabil Elias. 2007. Corporate governance in developing economies? The case of Egypt. *International Journal of Business Governance and Ethics* 3: 430–45. [CrossRef]
- Cohen, Jacob. 1988. *Statistical Power Analysis for the Behavioral Sciences*, 2nd ed. Hillsdale: Lawrence Erlbaum Associates.
- Dahawy, Khaled. 2009. Developing Nations and Corporate Governance: The Story of Egypt. In The Global Corporate Governance Forum, The International Financial Corporation (IFC). Available online: [http://www.ifc.org/ifcext/cgf.nsf/AttachmentsByTitle/PaperKhaledDahawy/\\$FILE/Dahawy_Kahled4.pdf](http://www.ifc.org/ifcext/cgf.nsf/AttachmentsByTitle/PaperKhaledDahawy/$FILE/Dahawy_Kahled4.pdf) (accessed on 24 September 2010).
- De Andrés, Pablo, Laura Arranz-Aperte, and Juan Antonio Rodriguez-Sanz. 2017. Independent versus non-independent outside directors in European companies: Who has a say on CEO compensation? *BRQ Business Research Quarterly* 20: 79–95. [CrossRef]
- Denis, Diane K., and John J. McConnell. 2003. International corporate governance. *Journal of Financial and Quantitative Analysis* 38: 1–36. [CrossRef]
- Desoky, Abdelmohsen M., and Gehan A. Mousa. 2012. Corporate governance practices: Transparency and disclosure—evidence from the Egyptian exchange. *Journal of Accounting, Finance and Economics* 2: 49–72.
- Dharmastuti, Christiana, and Sugeng Wahyudi. 2013. The effectivity of internal and external corporate governance mechanisms towards corporate performance. *Research Journal of Finance and Accounting* 4: 132–39.
- DiCiccio, Cyrus J., Joseph P. Romano, and Michael Wolf. 2019. Improving weighted least squares inference. *Econometrics and Statistics* 10: 96–119. [CrossRef]
- Easterbrook, Frank H. 1984. Two agency-cost explanations of dividends. *American Economic Review* 74: 650–59.
- Ebaid, Ibrahim El-Sayed. 2011. Corporate governance practices and auditor's client acceptance decision: Empirical evidence from Egypt. *Corporate Governance: The International Journal of Business in Society* 11: 171–83. [CrossRef]
- ECCG (Egypt Code of Corporate Governance). 2011. Egypt Code of Corporate Governance: Guideline and Standards. Available online: https://www.ecgi.global/sites/default/files/codes/documents/code_egypt_2011_englishtranslation2016.pdf (accessed on 22 May 2024).
- ECCG (Egypt Code of Corporate Governance). 2016. Egypt Code of Corporate Governance. Available online: https://www.ecgi.global/sites/default/files/codes/documents/egypt_cg_code.pdf (accessed on 22 May 2024).
- Ezazi, Mohammad Esmail, Seyed Jalal Sadeghi, Mehrdad Alipour, and Hossein Amjadi. 2011. The effect of ownership structure on share price volatility of listed companies in Tehran Stock Exchange: An empirical evidence of Iran. *International Journal of Business and Social Science* 2: 163–69.
- Gitman, Lawrence J., and Chad J. Zutter. 2011. *Principles of Managerial Finance*, 13th ed. Upper Saddle River: Prentice Hall.
- Gutiérrez, María, and Maribel Sáez. 2013. Deconstructing independent directors. *Journal of Corporate Law Studies* 13: 63–94. [CrossRef]
- Harris, Milton, and Artur Raviv. 2008. A theory of board control and size. *The Review of Financial Studies* 21: 1797–832. [CrossRef]

- Hashemijoo, Mohammad, Aref Mahdavi Ardekani, and Nejat Younesi. 2012. The impact of dividend policy on share price volatility in the Malaysian stock market. *Journal of Business Studies Quarterly* 4: 111–29.
- Horsthuis, Ludo. 2019. Internal Corporate Governance Mechanisms and Corporate Performance: Evidence from Dutch Listed Firms. Master's thesis, University of Twente, Enschede, The Netherlands.
- Hussainey, Khaled, Chijoke Oscar Mgbame, and Aruoriwo M. Chijoke-Mgbame. 2011. Dividend policy and share price volatility: UK evidence. *The Journal of Risk Finance* 12: 57–68. [CrossRef]
- Isshaq, Zangina, Godfred A. Bokpin, and Joseph Mensah Onumah. 2009. Corporate governance, ownership structure, cash holdings, and firm value on the Ghana Stock Exchange. *The Journal of Risk Finance* 10: 488–99. [CrossRef]
- Jane Lenard, Mary, Bing Yu, E. Anne York, and Shengxiong Wu. 2014. Impact of board gender diversity on firm risk. *Managerial Finance* 40: 787–803. [CrossRef]
- Jensen, Michael C., and William H. Meckling. 1976. Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics* 3: 305–60. [CrossRef]
- Jizi, Mohammad Issam, and Rabih Nehme. 2017. Board gender diversity and firms' equity risk. *Equality, Diversity and Inclusion: An International Journal* 36: 590–606. [CrossRef]
- Kamel, Hany, and Tamer Shahwan. 2014. The association between disclosure level and cost of capital in an emerging market: Evidence from Egypt. *Afro-Asian Journal of Finance and Accounting* 4: 203–25. [CrossRef]
- Kenawy, Ezzat Molouk, and Mohamed F. K. Abd Elgany. 2009. Corporate governance and its potential implementation in Egypt in light of international experiences. *Journal of Public Administration and Policy Research* 1: 84.
- Lee, See-Nie, Chee-Wooi Hooy, and Fauziah Md Taib. 2019. The effect of corporate governance on firm stock volatility in Asia. *Journal of Asia-Pacific Business* 20: 25–47. [CrossRef]
- Machado, Vanessa Noguez, Lauren Dal Bem Venturini, Márcia Bianchi, and Marco Antônio dos Santos Martins. 2021. Evidence of the Economic Context in the Relationship between Corporate Governance and Stock Market Volatility in the Brazilian Public Companies/Evidenciacao do Contexto Economico na Relacao entre Governanca Corporativa e Volatilidade das Acoes nas Companhias Abertas Brasileiras. *Revista Contabilidade, Gestao e Governanca (CGG)* 24: 1–19.
- Maher, Maria, and Thomas Andersson. 2000. Corporate Governance: Effects on Firm Performance and Economic Growth. *SSRN Electronic Journal*. [CrossRef]
- Malik, Saif Ullah. 2012. Relationship between corporate governance score and stock prices: Evidence from KSE-30 Index companies. *International Journal of Business and Social Science* 3: 239–49. Available online: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1989875 (accessed on 4 March 2024).
- Masulis, Ronald W., and Shawn Mobbs. 2011. Are all inside directors the same? Evidence from the external directorship market. *The Journal of Finance* 66: 823–72. [CrossRef]
- Mezhoud, Mediha, Asma Sghaier, and Adel Boubaker. 2017. The Impact of Internal Governance Mechanisms on the Share Price Volatility of Listed Companies in Paris Stock Exchange. *Bulletin of Applied Economics* 4: 1.
- Mishkin, Frederic S., and Stanley G. Eakins. 2006. *Financial Markets and Institutions*. Delhi: Pearson Education India.
- Nasr, Mahmoud A., and Collins G. Ntim. 2018. Corporate governance mechanisms and accounting conservatism: Evidence from Egypt. *Corporate Governance: The International Journal of Business in Society* 18: 386–407. [CrossRef]
- Nazir, Mian Sajid, Abdullah, and Muhammad Musarrat Nawaz. 2012. How dividend policy affects volatility of stock prices of financial sector firms of Pakistan. *EuroJournals Publishing Incorporation: American Journal of Scientific Research* 61: 132–39.
- Nickell, Stephen. 1981. Biases in dynamic models with fixed effects. *Econometrica: Journal of the Econometric Society* 49: 1417–26. [CrossRef]
- Ntim, Collins G., and Kofi A. Osei. 2011. The impact of corporate board meetings on corporate performance in South Africa. *African Review of Economics and Finance* 2: 83–103.
- Ogbeide, Sunday, and Esther Ikavbo Evbayiro-Osagie. 2019. Corporate governance mechanisms and share price volatility of quoted firms: Insights from Nigeria. *International Journal of Accounting & Finance (IJAF)* 8: 50–59. Available online: https://www.researchgate.net/publication/358978996_CORPORATE_GOVERNANCE_MECHANISMS_AND_SHARE_PRICE_VOLATILITY_OF_QUOTED_FIRMS_INSIGHTS_FROM_NIGERIA (accessed on 7 March 2024).
- Profilet, Kyle A. 2013. Dividend Policy and Stock Price Volatility in the US Equity Capital Market. Theses & Honors Papers. 145. Available online: <https://digitalcommons.longwood.edu/etd/145> (accessed on 6 March 2024).
- Provaty, Sagira Sultana, and Khairul Alam Siddique. 2021. Impact of dividend policy on stock price volatility: An empirical study on financial service industry of Bangladesh. *Journal of Financial Markets and Governance* 1: 16–32. [CrossRef]
- Raheja, Charu G. 2005. Determinants of board size and composition: A theory of corporate boards. *Journal of Financial and Quantitative Analysis* 40: 283–306. [CrossRef]
- Raithatha, Mehul, and Arunima Halder. 2021. Are internal governance mechanisms efficient? The case of a developing economy. *IIMB Management Review* 33: 191–204. [CrossRef]
- Rani, Neelam, Surendra S. Yadav, and P. K. Jain. 2013. Impact of corporate governance score on abnormal returns of mergers and acquisitions. *Procedia Economics and Finance* 5: 637–46. [CrossRef]
- Rashid, Afzalur, and AZM Anisur Rahman. 2008. Dividend policy and stock price volatility: Evidence from Bangladesh. *The Journal of Applied Business and Economics* 8: 71.

- Ratnawati, Vince, Mohamad Ali Abdul-Hamid, and Oluwatoyin Muse Johnson Popoola. 2016. The influence of agency conflict types I and II on earnings management. *International Journal of Economics and Financial Issues* 6: 126–32.
- Samaha, Khaled, Khaled Dahawy, Khaled Hussainey, and Pamela Stapleton. 2012. The extent of corporate governance disclosure and its determinants in a developing market: The case of Egypt. *Advances in Accounting* 28: 168–78. [CrossRef]
- Samontaray, Durga Prasad. 2010. Impact of corporate governance on the stock prices of the nifty 50 broad index listed companies. *International Research Journal of Finance and Economics* 41: 7–18.
- Shahwan, Tamer Mohamed. 2015. The effects of corporate governance on financial performance and financial distress: Evidence from Egypt. *Corporate Governance* 15: 641–62. [CrossRef]
- Shahwan, Tamer Mohamed, and Ahmed Mohamed Habib. 2020. Does the efficiency of corporate governance and intellectual capital affect a firm's financial distress? Evidence from Egypt. *Journal of Intellectual Capital* 21: 403–30. [CrossRef]
- Shahwan, Tamer Mohamed, and Mohamed Mahmoud Fathalla. 2020. The mediating role of intellectual capital in corporate governance and the corporate performance relationship. *International Journal of Ethics and Systems* 36: 531–61. [CrossRef]
- Sharma, Nidhi. 2017. Corporate governance mechanisms in India. *International Journal for Advance Research and Development* 2: 132–37.
- Shleifer, Andrei, and Robert W. Vishny. 1997. A survey of corporate governance. *The Journal of Finance* 52: 737–83. [CrossRef]
- Soliman, Mohammed, and Mohamed Abdel Salam. 2013. Corporate Governance Practices and Audit Quality: An Empirical Study of the Listed Companies in Egypt. Available online: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2257815 (accessed on 22 May 2024).
- Sorour, M. Karim. 2014. Corporate governance reform in Egypt: Achievements and challenges ahead. *Corporate Governance: An International Perspective* 8: 143–55.
- Sullivan, John D. 2003. In *Search of Good Directors: A Guide to Building Corporate Governance in the 21st Century*. Washington, DC: Center for International Private Enterprise, pp. 409–18.
- Tan, Monica, and Bin Liu. 2016. CEO's managerial power, board committee memberships and idiosyncratic volatility. *International Review of Financial Analysis* 48: 21–30. [CrossRef]
- Thanatawee, Yordying. 2021. The impact of foreign ownership on stock price volatility: Evidence from Thailand. *Journal of Asian Finance, Economics and Business* 8: 7–14.
- Thomsen, Steen, and Torben Pedersen. 2000. Ownership structure and economic performance in the largest European companies. *Strategic Management Journal* 21: 689–705. [CrossRef]
- Valls Martínez, María del Carmen, and Rafael Soriano Román. 2022. Women in monitoring positions and market risk. Are the stocks of companies with gender diverse boards less volatile? *Frontiers in Psychology* 13: 1049175. [CrossRef]
- Vo, Xuan Vinh. 2015. Foreign ownership and stock return volatility—Evidence from Vietnam. *Journal of Multinational Financial Management* 30: 101–9. [CrossRef]
- Wahba, Hayam. 2015. The joint effect of board characteristics on financial performance: Empirical evidence from Egypt. *Review of Accounting and Finance* 14: 20–40. [CrossRef]
- World Bank. 2009. Report on the Observance of Standards and Codes (ROSC): A Corporate Governance Country Assessment for The Arab Republic of Egypt. Available online: <https://documents1.worldbank.org/curated/en/348141468247498839/text/625420WP0P114000Box0361486B0PUBLIC0.txt> (accessed on 22 May 2024).

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