Do ownership structure mechanisms affect a firm's risks? *Evidence from Egypt*[1]

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ABSTRACT

This study examines the influence of ownership structure mechanisms as a determinant of corporate governance quality on a firm's risks. Eight variables were used as proxies for the ownership structure practices. Our sample includes most non-financial firms listed on the Egyptian Exchange in 2014–2018. The least absolute value estimator was used to examine the influence of ownership structure mechanisms. Our findings reveal a significant positive impact of ownership concentration on a firm's unsystematic risk, but a negative effect on its systematic risk. Institutional ownership and a firm's total risk have a significant negative relationship. Managerial ownership is positively associated with systematic risk. Firm size as a control variable has a significant negative impact on unsystematic risk and total risk. Return on assets adversely influences systematic risk and total risk. Our findings may help managers and practitioners to understand and modify ownership structure mechanisms to better control a firm's risks.

Keywords: Ownership Structure Mechanisms, Firm's Risks, Unsystematic Risk, Systematic Risk, Total Risk, Egypt.

1- INTRODUCTION

The harmful effects of the 2008 financial crisis and the prominent scandals of large corporations such as Enron, Lehman Brothers, and World Com have stimulated an increasing interest in the corporate

governance (CG) practices. As documented by (Madhani, 2007), CG mechanisms can be considered a safeguard of a firm's assets. Moreover, (Abor and Biekpe, 2007) argued that good practices of CG mechanisms play an essential role in enhancing the whole society's prosperity, firm accountability, shareholder value, and the protection of stakeholders' interests.

At the same time, the positive correlation between high-return preferences of shareholders and their willing to bear excessive risks might increase the risk of an agency problem because of the conflict of shareholders' and managers' interests. Besides this risk–return paradox, additional conflict of interests can also be raised when the largest shareholders confiscate the minority shareholders' rights. Thus, numerous efforts have been exerted by researchers and practitioners to examine the impact of ownership structure on the firm's outcomes (e.g., Crutchley, et al., 1999; Delgado-García, et al., 2010; Nguyen, et al., 2015; Shahwan, 2015; Baek, et al., 2016; Martínez-Ferrero, et al., 2016; Abousamak and Shahwan, 2018). Significant attention has been directed toward ownership structure attributes and their impact on the firm's risks (e.g., Dong, et al., 2014; Jafarinejad, et al., 2015; Poletti-Hughes and Williams, 2017; Felício, et al., 2018). For instance, (Paligorova, 2010) confirmed the positive impact of ownership concentration on corporate risk-taking. Vo (2016) showed that institutional shareholdings negatively affect the firm's risks by balancing the volatility of the firm's stock return. In addition, numerous studies concluded that the controlling shareholders' identity would also affect a firm's risk-taking behavior (e.g., Barry, et al., 2011; Iannotta, et al., 2013). The World Bank report on the observance of standards and codes (ROSC) pointed out that a full compliance with good corporate governance practices would lead to numerous benefits such as a high level of productivity, enhancing a firm's economic value added, and reducing systemic financial failures (The World Bank, 2009). Therefore, the relationship between corporate governance, particularly the ownership structure mechanisms and a firm's risks is of particular interest.

As an emerging market, the CG practices within Egyptian firms have experienced significant changes. The first initiative was a collaborative project between the World Bank and the Ministry of Foreign Trade in 2001 for evaluating the CG practices against the best practices developed by the Organization of Economic Cooperation and Development (OECD) (Shahwan, 2015). Subsequently, in October 2005, the Egyptian Institute of Directors at the Egyptian Financial Supervisory Authority issued the first draft of the non-mandatory Egyptian Corporate Governance Code (Ebaid, 2011). The recent updated version of the Egyptian corporate governance code has been issued in July 2016 where this code is still non-mandatory. Regarding the assessment of CG practices in Egypt, the ROSC report issued by the World Bank in 2009 concluded that Egypt has partially adopted the principles of corporate governance issued by the OECD (The World Bank, 2009). Abousamak and Shahwan (2018) also indicated that Egyptian firms received low scores on compliance with good practices of CG as determined by the Egyptian corporate governance code. Recently, based on 51 non-financial firms listed on the Egyptian Exchange from 2014-2016, (Shahwan and Habib, 2020) asserted a low level of corporate governance efficiency in the selected sample.

In the context of ownership structure within Egyptian firms, (Abousamak and Shahwan, 2018) reveal that the percentage of controlling shareholders is relatively high. Based on agency theory, increasing the percentage of ownership concentration, on the one hand, would raise a conflict of interests with other shareholders, particularly the minority shareholders. Such a conflict would be destructive when the interests of other shareholders are manipulated by the controlling shareholders. As documented by OECD (2006), a poor corporate governance would be harmful for both the minority and controlling shareholders in terms of lower valuations of firms, risk increasing, and declining the equity finance opportunities. On the other, increasing the percentage of ownership concentration and institutional ownership would alleviate the free-ride-problem, thus, reducing the conflict of interests between shareholders and managers (Shleifer and Vishny, 1997; Wang and Deng, 2006).

Another type of conflict is due to the conflict of interests between the principal and agent as a result of the separation between ownership and management, namely known agency problem. According to (Jensen and Meckling, 1976) and (Hasan and Butt, 2009), managing such a conflict using good practices of ownership structure reduces the agency costs and corporate risk taking. As argued by (Locke and Duppati, 2014), the agency costs in mixed ownership models were lower than the concentrated state-owned firms. Moreover, (Larma, 2016) pointed out that the owner type instead of the ownership concentration had a positive impact on corporate risk taking. However, (Parker, et al., 2002) concluded that firm survival was positively associated with higher levels of ownership concentration.

Although there are numerous literature that investigate the association between the ownership structure mechanisms and firms' risks in the majority of developed markets, there is no general agreement among researchers regarding the attitude of such relationship. Moreover, there is little literature on this issue in developing and emerging markets. Therefore, this study helps to extend the literature related to CG by examining the practices of ownership structure mechanisms within Egyptian firms. At the same time, this study is highly motivated to examine whether good practices related to ownership structure of firms affects a firm's risks in the Egyptian environment as an emerging market. This study can be considered, to the best of our knowledge, one of the first attempts to clarify such hypothetical relationship.

Accordingly, this analysis of this hypothetical relationship between ownership structure mechanisms and a firm's risks could reveal critical policy implications to Egypt and other emerging markets in several ways. First, this study sheds light on the level of ownership structure practices as internal and external control mechanisms within Egyptian firms. Good ownership structure practices might ensure the efficient use of a firm's resources, which consequently reduces the firm's riskiness. As documented by (Crutchley, et al., 1999), the systematic risk of the firm as measured by beta is negatively associated with insider ownership.

Second, an analyzing of the active role of institutional ownership might enhance financial managers' ability to decrease a firm's perceived riskiness and reshape the firm's capital structure strategy, thereby reducing the firm's cost of capital and the stock market volatility (Lima and Sanvicente, 2013). Accordingly, this study's findings are of interest to policy-makers seeking to minimize any legislative and administrative constraints that adversely affect the role of institutional investors. The rest of this paper is structured as follows. Section 2 summarizes the literature review and hypotheses development. Section 3 presents the measurement of variables. Section 4 describes the data collection and methodology. Section 5 introduces the results and discussion. Finally, Section 6 concludes the paper and presents its implications.

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1 The Effect of Ownership Concentration (CON) on the Firm's Risks

The impact of ownership concentration on a firm's risks has received much attention in the past decades. However, no general agreement has been reached among researchers (Jensen and Meckling, 1976; Agrawal and Mandelker, 1987; Anderson and Fraser, 2000; Anderson and Reeb, 2003; John, et al., 2008; Faccio, et al., 2011; An, et al., 2014). On the one hand, some of these studies have reported a positive significant impact of ownership concentration on a firm's risk-taking (Jensen and Meckling, 1976; Paligorova, 2010). For instance, (Jensen and Meckling, 1976) found a positive association between concentrated (controlling) shareholders and corporate risk-taking. Holmstrom and Ricart I Costa (1986) (Anderson and Fraser, 2000) and (John, et al., 2008) also demonstrated that a high level of ownership concentration and well-diversified large shareholders increase the risk preference of a firm due to the dominance of the incentive alignment effect. Paligorova (2010) showed that equity ownership of the largest shareholders positively influences corporate risk-taking. Faccio, et al. (2011) concluded that diversified large shareholders positively affect corporate risk taking. Zhong (2017) found a positive significant correlation between ownership concentration and the bank's risk preference based on a

sample of 25 Chinese listed banks. Felício, et al. (2018) also showed that more concentrated shareholdings (block ownership) positively impacts bank risks (e.g., total risk, systematic risk, and idiosyncratic risk).

On the other hand, some studies have reported the negative association between ownership concentration and corporate risk-taking (e.g., May, 1995; Tufano, 1996; Larcker, et al, 2007; Matić and Papac, 2014). Put another way, controlling shareholders tend to invest in conservative projects as such projects serve their private benefits of control. This suggestion is also supported by (John, et al., 2008) where managers always tend to select less risky projects or even avoid risky projects in favor of their career and reputation concerns. This has led to outline the following hypothesis:

H1: Ownership concentration positively affects the corporate risk.

2.2 The Impact of Institutional Ownership (INSOWN) on the Firm's Risks

Recently, institutional ownership has been a prominent CG practice due to the central role of institutional investors in capital markets (Gillan and Starks, 2000; Amihud and Li, 2006). According to (Agrawal and Mandelker, 1987), there is a direct association between institutional investors and shareholders' wealth. The active role of institutional ownership can be attributed to pressure-sensitive and pressure-resistant institutional investors (Ruiz-Mallorquí and Santana-Martín, 2009; Delgado-García, et al., 2010; Jara-Bertin, et al., 2012). The dual role of pressure-sensitive institutional investors (e.g., banks and insurance companies) as creditors and shareholders provides superior information and control for institutional investors, which consequently enhances their ability to be more efficient monitors (Li, et al., 2006; Bhattacharya and Graham, 2007). However, this dual role might lead to potential conflicts of interests between institutional investors and managers or other stakeholders in extracting private benefits (Ruiz-Mallorquí and Santana-Martín, 2009; Delgado-García, et al., 2010). On the other hand, pressure-resistant institutional investors, when they hold a sufficient percentage of ownership, efficiently attract their

attention to the risk-taking activity at target firms (Jara-Bertin, et al., 2012).

Numerous studies have investigated the link between institutional ownership and the firm's risks (e.g., Morck and Nakamura, 1999; Li, et al., 2011; An, et al., 2014; Jafarinejad, et al., 2015; Vo, 2016). However, these studies have reported mixed evidence. On the one hand, several studies report a positive association between institutional ownership and the firm's risks (Sias, 1996; Li, et al., 2011; Chakraborty, et al., 2019). For instance, (Li, et al., 2011) demonstrated that the existence of foreign institutional ownership increases the firm's information transparency and reliability, which consequently enhances a firm's risk-taking. An, et al., (2014) also found a significantly positive relationship between foreign institutional ownership and corporate risk-taking. This finding was consistent with the conclusion of Sias (1996), (Hutchinson, et al., 2015) and (Chakraborty, et al., 2019), who provided empirical evidence that institutional shareholdings positively affect the firm's risks.

On the other hand, reviewing past literature supports the significant negative correlation between institutional ownership and a firm's risk.(Jafarinejad, et al., 2015) for example, found that there is an inverse relationship between a firm's idiosyncratic risk and the proportion of shares held by institutional investors. Similarly, (Vo, 2016) reported that a substantial amount of equity ownership held by institutional investors will reduce (stabilize) the firm's stock return volatility. Thus, our hypothesis would be as follows:

H2: Institutional ownership negatively affects the corporate risk.

2.3 The Impact of State Ownership (STOWN) on the Firm's Risks

Many studies have been shown that the identity of the controlling shareholders mainly determines and controls the risk-taking behavior of organizations (John, et al., 2008; Barry, et al., 2011). State-owned enterprises (SOEs) usually tend to take more risks than other privately owned firms, since the state ownership seeks political preferences and interference at the expense of corporate profitability and shareholders'

interests (Clarke, et al., 2005; Tian and Estrin, 2008). In addition, a low level of performance incentives within SOEs might result in excessive risk-taking (Shleifer and Vishny, 1994).

The positive relationship between state ownership and the firm's risks has been supported by some empirical evidence (Iannotta, et al., 2007; Dong, et al., 2014; Larma, 2016; Zhang, et al., 2018). For instance, (Dong, et al., 2014) concluded that banks controlled by the government are riskier than those controlled by state-owned enterprises [1] and private investors. Bratfos and Kringlebu (2015) found that state ownership has a neutral effect on abnormal return, and that it increases the systematic risk compared to private ownership. Larma (2016) and (Zhang, et al., 2018) also reported that state-owned enterprises have a positive impact on risk-taking. However, some studies have found contradictory results that indicate firms with high state ownership tend to engage less with risky assets. For instance, (Boubakri, et al., 2013) reported that managers of SOEs tend to be conservative toward risk-taking to maintain their jobs. This study thus hypothesizes that:

H3: State ownership positively affects the corporate risk.

2.4 The Impact of Managerial Ownership (MOWN) on the Firm's Risks

Managerial ownership refers to the proportion of shares held by managers. As noted by (Li, et al., 2008) and (Pathan, 2009), increasing the insider ownership might enhance the alignment of interests between managers, employees and shareholders. This will consequently encourage risk-taking because of shareholders' preference for higher risks and higher returns. Chakraborty, et al. (2019) also argued that there is a positive association between insider equity ownership and the firm's risks in cross-listed companies, where the incentives of managerial ownership are aligned with the interests of shareholders. This implies that insider shareholdings mitigate the agency problem associated with risk-taking.

In contrast, a growing body of literature has shown that a high level of expropriation, and strengthening managerial entrenchment are

potential outputs of a high level of managerial ownership (Schooley and Barney, 1994; Wansley, et al., 1996). Based on managerial entrenchment theory, the agency costs start to increase as the proportion of shares held by managers increases after entrenchment occurs (Crutchley, et al., 1999). The existence of this U-shaped relationship between agency costs and insider ownership percentage might discourage corporate risk-taking. Therefore, the following hypothesis is proposed:

H4: Insider ownership positively affects the corporate risk.

2.5 The Effect of Family Ownership (FAMOWN) on the Firm's Risks

Recently, many studies have investigated how family firms differ from non-family firms in terms of CG and risk-taking. For instance, (Jensen and Meckling, 1976) and (Landry, et al., 2013) claimed that the existence of such control by family owners can alleviate principal-agent problems. As noted by (Anderson and Reeb, 2003) and (Maury, 2006) family firms are more efficient at controlling agency costs since family members play a dual role as principal and agent. (Moreover, et al., 2003) and (Andersonet al., 2003) pointed out that family-controlled firms experience less diversification and lower cost of debt, which consequently makes them riskier. Schmid (2013) and (Baek, et al., 2016) showed that family firms are highly motivated to use more debt due to the reduced agency costs between creditors and family owners within these firms. Put another way, a firm with a higher level of family ownership has lower agency costs, which consequently may encourage risk-taking behavior in such a firm. Nguyen (2011) reported that family control and ownership concentration have a positive impact on idiosyncratic risk. Chakraborty, et al. (2019) also found a significant positive association between family ownership and risk-taking in Canadian-only firms, while such a relationship was not found in cross-listed firms. In addition, (Poletti-Hughes and Williams, 2017) posited that family firms in Mexico take more risk than non-family firms. Therefore, the following hypothesis can be formulated:

H5: Family ownership positively affects the corporate risk.

3. MEASURING THE OWNERSHIP STRUCTURE AND THE FIRM'S RISKS

Numerous factors of ownership structure have been deployed as independent variables. The first factor is ownership concentration (CON), (Munisi, et al., 2014) and (Nguyen, et al., 2015) showed that ownership concentration is defined as the percentage of shares held by shareholders whose ownership is at least 5% of the total common stocks issued by a firm. Delgado-García, et al. (2010) argued that the inclusion of the first and second largest shareholders (1st LSHOLD and 2nd LSHOLD, respectively) can be good proxies for the impact of direct and indirect ownership concentration. As illustrated by (Delgado-García, et al., 2010), the relative difference in ownership concentration between first and second largest shareholders scaled by the first largest shareholdings (RELDIFF) has been used as a proxy for the contestability of the largest shareholder's power.

Regarding the institutional ownership factor (INSOWN), (Jafarinejad, et al., 2015), and (Vo, 2016) argued that the proportion of shares held by institutional investors in one particular firm can be adopted as a proxy for the institutional ownership factor. Similarly, the state ownership factor (STOWN) consists of the percentage of shares held by the state, as proposed by (Zhang, et al., 2018). Following (Chakraborty, et al., 2019), managerial ownership (MOWN) is measured as the percentage of equity held by managers, directors, and supervisors. Finally, family ownership (FAMOWN) consists of the proportion of shares held by identified family members and entities (Baek, et al., 2016).

Regarding the firm's risks, three different types of risks – namely, unsystematic risk, systematic risk, and total risk have been deployed as dependent variables. Numerous studies have used the volatility of a firm's daily stock return as a proxy for the firm's total risk (e.g., Pathan, 2009; Victoravich, et al., 2011; Felício, et al., 2018; Chakraborty, et al., 2019).

Regarding the systematic risk, (Delgado-García, et al., 2013), (Jafarinejad, et al., 2015) and (Felício, et al. 2018) document the use of beta as a relative measure of the firm's systematic risk. Based on the

market model proposed by Sharpe (1964), the beta coefficient can be estimated as follows:

$$R_{it} = \alpha_{it} + \beta_{it}R_{mt} + \varepsilon_{it} \qquad (1)$$

where Rit represents the returns for firm (i) at time t. Rmt is the return on the market portfolio, measured as the EGX30 stock market index; and ßit is the slope of the market model, which represents the estimate of the systematic risk for firm (i) at time t.

The Sharpe index model also shows that the total risk equals the sum of both systematic and unsystematic risks. Thus, the total risk for firm (i) can be defined as follows (Delgado-García, et al., 2013):

$$\sigma_{Ri}^2 = \beta_i^2 \sigma_m^2 + \sigma_{\varepsilon i}^2 \qquad (2)$$

where σ_{Ri}^2 is the variance in the returns of firm (i) representing the firm's total risk. The standard deviation of the error term $\sigma_{\varepsilon i}^2$ is a measure of the unsystematic risk for firm (i) over a specified period.

A number of control variables have been used. Following Jafarinejad et al. (2015), the natural logarithm of the firm's total asset is used as a good proxy for firm size. Another control variable is the firm's leverage measured as a ratio of total debt to total equity. Felício, et al. (2018) reported a positive association between leverage and the firm's risks, implying that greater leverage means higher risk.

The return on assets (ROA) is also used to control for firm performance where less profitable firms are riskier (Jafarinejad, et al., 2015). To control for the firm age in the current study, the number of years of being listed (incorporation) on the Egyptian Exchange is specified as a proxy for firm age. (Poletti-Hughes and Williams, 2017) found a significant negative association between risk-taking and firm age. Sales growth ratio is also included as a control variable, following research that has established a significant positive relationship between sales growth and risk-taking (e.g., John, et al., 2008; Peng, 2015). This ratio is measured by computing the difference in sales between the current and previous years and dividing it by the previous year's sales.

4. DATA COLLECTION AND THE METHODOLOGY

4.1 Data Collection and Sample Selection

Initially, this study's sample consisted of 150 firms listed on the Egyptian Exchange for the period 2014–2018. Table 1, Panel A illustrates the description of the final sample. At the first stage, 31 financial firms were excluded due to their non-comparability to non-financial firms. The financial reports and daily closing prices of the remaining 119 non-financial firms have been requested through a personal visit to Egypt for Information Dissemination (EGID). However, additional 27 non-financial firms were further excluded due to the unavailability of annual reports. Moreover, 9 companies were also excluded due to insufficient data required for computing the study's variables. Accordingly, the final sample consisted of 83 non-financial Egyptian listed firms over the period 2014-2018, with a total of 415 observations. This final sample size represented almost 69.71 percent of its target population. Table 1, Panel B illustrates different categories of the final sample which are derived from different six industries.

Regarding the representativeness of the selected sample, the final sample represents 37.7 percent of the average number of listed firms (220 firms) in the Egyptian Exchange over the period from 2014 to 2018. This sample size is consistent with the size of the samples previously used in corporate governance studies within Egyptian environment (e.g., Elsayed and Whaba, 2013; Wahba, 2015; Shahwan, 2015; Abousamak and Shahwan, 2018).

Table 1: Sample size and sector-wise distribution of sampled companies

Panel A: Description of the final sample		
	No. of Firms	**% of sample**
Initial Sample	150	126
Financial firms	(31)	(26)
Non-financial firms	119	100
Companies with unavailable financial reports during the study period	(27)	(22.69)
Companies with insufficient data	(9)	(7.6)

Final sample	83	69.71
Panel B: Decomposition of the final sample		
Sector	**No. of Firms**	**% of Sample**
Food and Beverage	20	24.1
Construction and Real Estate	29	34.9
Industrial Goods and Services	9	10.8
Healthcare and Pharmaceuticals	7	8.4
Chemicals	5	6
Basic Resources	13	15.7
Total of the Final Sample	83	100
No. of observations over the study period	415	

The descriptive statistics for the study variables have been summarized in Table 2. In the sample, the average and standard deviation of the firms' unsystematic risk are 0.02297 and 0.01025, respectively. The systematic risk as another indicator of firm risk has the mean value of 0.78984, with a highest value of 1.53694 and a lowest value of -0.02430. The total risk as an additional measure of firm risk ranges from 0.01359 to 0.06293, with a mean of 0.02667 reflecting a significant variability in the stock returns of the selected listed firms on the Egyptian Exchange. On average, the ownership concentration in Egyptian firms is about 61.356%, with a highest value of 1. This indicates that ownership concentration is predominant in Egyptian listed firms. It should also be noted that the proportion of ownership concentration varies substantially from 0% to about 100%, indicating the heterogeneity of ownership structure across firms. Moreover, there is little difference in average values of managerial and institutional ownership among the selected firms (10.012% vs. 11.306%). The state ownership average represents 0.26015 of our data set with a standard deviation of 0.28948. The maximum family ownership percentage is 0.66170, while the mean is 0.04921.

Table 2: Descriptive summary statistics

Variables	Mean	Std Dev	Minimum	Maximum
Dependent Variables:				
UNRISK	0.02297	0.01025	0.00096	0.06251
SYSRISK	0.78984	0.41638	-0.02430	1.53694
TRISK	0.02667	0.00921	0.01359	0.06293
Independent Variables:				
CON	0.61356	0.23503	0	1
1st LSHOLD	0.41555	0.23668	0.01180	0.91700
2nd LSHOLD	0.10914	0.07826	0	0.35000
RELDIFF	0.60423	0.29979	0.00039	1
MOWN	0.10012	0.19692	0	0.91806
INOSWN	0.11306	0.17153	0	0.90960
STOWN	0.26015	0.28948	0	0.917
FAMOWN	0.04921	0.13275	0	0.66170
Control Variables:				
FSIZE	20.41338	1.54509	17.251	25.110
LEV	2.31560	14.2760	-21.6677	181.2622
ROA	0.03867	0.11216	-0.39308	0.60182
Fage	19.36747	6.04257	7	57
SGROW	0.25109	0.96409	-1.05495	9.65050

4.2 Testing the Hypotheses

The current study adopts the least absolute value (LAV) regression to test study hypotheses. The LAV regression estimates the explanatory variables' coefficients that minimize the absolute values of the residuals (Dielman, 2005). Dielman and rose (1997) assert the superiority of LAV regression as a robust alternative against least squares in the presence of non-normal error distributions and outliers. At the same time, as argued by (Dielman, 1989), the LAV forecasts outperform the forecasts of least square methods in the existence of outliers. Furno (2000) also supports the robustness of LM tests based on the LAV residuals for testing the autocorrelations and the conditional heteroscedasticity under non-normality.

Accordingly, three specific regressions estimated in Equations (3)–(5) were designed to test H1, H2, H3, H4 and H5, and they are represented as follows:

$$UNRISK_{it} = \beta_0 + \beta_1 (CON)_{it} + \beta_2 (1^{st}LSHOLD)_{it} + \beta_3 (2^{nd}LSHOLD)_{it} + \beta_4 (RELDIFF)_{it} -$$
$$\beta_5 (INSOWN)_{it} + \beta_6 (STOWN)_{it} + \beta_7 (MOWN)_{it} + \beta_8 (FAMOWN)_{it} -$$
$$\beta_9 (FSIZE)_{it} + \beta1_0 (LEV)_{it} - \beta_{11} (ROA)_{it} - \beta_{12} (Fage)_{it} + \beta_{13} (SGROW)_{it} + \varepsilon_i \qquad (3)$$

$$SYSRISK_{it} = \alpha0 + \alpha1 (CON)_{it} + \alpha2 (1stLSHOLD)_{it} + \alpha3 (2ndLSHOLD)_{it} + \alpha4$$
$$(RELDIFF)_{it} - \alpha5 (INSOWN)_{it} + \alpha6 (STOWN)_{it} + \alpha7 (MOWN)_{it} + \alpha8$$
$$(FAMOWN)_{it} - \alpha9 (FSIZE)_{it} + \alpha10 (LEV)_{it} - \alpha11 (ROA)_{it} - \alpha12 (Fage)_{it} + \qquad (4)$$
$$\alpha13 (SGROW)_{it} + \varepsilon_i$$

$$TRISK_{it} = \gamma0 + \gamma1 (CON)_{it} + \gamma2 (1stLSHOLD)_{it} + \gamma3 (2ndLSHOLD)_{it} + \gamma4$$
$$(RELDIFF)_{it} - \gamma5 (INSOWN)_{it} + \gamma6 (STOWN)_{it} + \gamma7 (MOWN)_{it} + \gamma8$$
$$(FAMOWN)_{it} - \gamma9 (FSIZE)_{it} + \gamma10 (LEV)_{it} - \gamma11 (ROA)_{it} - \gamma12 (Fage)_{it} + \gamma13 \qquad (5)$$
$$(SGROW)_{it} + \varepsilon_i$$

where $UNRISK_{it}$ represents the unsystematic risk of firm i at time t. $SYSRISK_{it}$ represents the systematic risk of firm i at time t; $TRISK_{it}$ refers to the total risk for each company i at time t; CON refers to ownership concentration as measured by the percentage of shares held by the shareholders whose ownership is at least 5% of the total number of a firm's common stocks issued; 1st LSHOLD and 2nd LSHOLD refer to the first and second largest shareholders; RELDIFF denotes the relative difference between first and second largest shareholders; INSOWN denotes the institutional ownership ratio; STOWN refers to state ownership ratio; MOWN is the managerial ownership ratio; FAMOWN is the family ownership ratio; FSIZE refers to firm size; LEV refers to leverage; ROA refers to the return on assets as a proxy for firm profitability; Fage is number of years that the firm has been listed on the Egyptian Exchange; SGROW represents sales growth ratio; [β_0, α_0, γ_0] are constants; [β_i, α_i, γ_i] are the regression coefficients of independent variables; and ε_i is the error term.

Table 3 presents the Pearson correlation coefficients among variables deployed in the three proposed models. It can be seen at first glance that the firm's unsystematic risk has a significant negative correlation with the institutional ownership ratio. This suggests that increased institutional ownership in a firm might lead to reduction in a firm's unsystematic risk. Moreover, the firm's unsystematic risk is negatively correlated with firm size. In the context of the firm's systematic risk,

this risk is negatively correlated with the level of ownership concentration, the percentage of shares held by the second largest shareholders, the state ownership ratio, and ROA. The firm's total risk is negatively correlated with the level of ownership concentration, institutional investor relationship, and state ownership. The firm's total risk is also negatively correlated with firm size.

Table 3: Correlation matrix

Variables	UN-RISK	SYS-RISK	T-RISK	CON	1st LS-HOLD	2nd LS-HOLD	REL-DIFF	MOWN	INS-OWN	ST-OWN	FAM-OWN	FSIZE	LEV	ROA	Fage	S-GROW
UNRISK	1															
SYSRISK	____	1														
TRISK	____	____	1													
CON	-0.099	-0.291**	-0.171*	1												
1st LS-HOLD	-0.051	-0.088	-0.068	0.730**	1											
2nd LS-HOLD	-0.031	-0.222**	-0.087	0.321**	-0.257**	1										
REL-DIFF	-0.007	0.037	0.008	0.333**	0.785**	-0.620**	1									
MOWN	-0.081	0.115	-0.078	-0.054	-0.298**	0.350**	-0.454**	1								
INSOWN	-0.182*	-0.121	-0.219**	0.272**	0.010	0.270**	-0.164*	0.043	1							
STOWN	-0.128	-0.166*	-0.179*	0.450**	0.519**	-0.082	0.381**	-0.256**	0.266**	1						
FAMOWN	0.019	-0.022	-0.008	-0.113	-0.186*	0.187*	-0.263**	0.519**	-0.097	-0.225**	1					
FSIZE	-0.172*	-0.090	-0.179*	0.178*	0.049	0.186*	-0.106	0.094	0.189*	0.083	-0.043	1				
LEV	-0.017	0.056	-0.003	0.067	0.111	-0.072	0.084	-0.013	-0.061	0.164*	0.009	-0.033	1			
ROA	-0.052	-0.203**	-0.103	-0.020	-0.207**	0.223**	-0.212**	0.170*	0.042	-0.051	0.064	0.051	-0.157*	1		
Fage	0.048	-0.080	0.028	0.113	0.213**	-0.158*	-0.173*	-0.186*	0.247**	0.255**	-0.046	-0.130	-0.005	-0.183*	1	
SGROW	0.008	-0.037	-0.002	0.070	0.120	-0.068	0.073	-0.025	0.004	0.148	0.007	0.121	-0.035	0.085	-0.028	1

** Significant at 0.01 (two-tailed),* significant at 0.05 (two-tailed)

Following Anderson, et al. (1990) the high level of Pearson correlation coefficient (> 0.70) can be an evidence of a possible collinearity problem among study variables. Accordingly, both 1st LSHOLD and RELDIFF were excluded for avoiding such severe collinearity.

5. RESULTS AND ANALYSIS

Table 4 summarizes the results of testing the main assumption of ordinary least square. The variance inflation factor (VIF) value confirms that multicollinearity is an unlikely problem among the remaining explanatory variables. The P-values of both the Shapiro–Wilk W Test

and Shapiro–Francia W' test are less than 0.01, indicating that the residuals are non-normally distributed. Similarly, the significant results of the Interquartile Range Test (IQR) in both model (1) and model (3) led to rejecting normality at the 1% significance level. The Jarque–Bera test was also used to check the normality of the residuals. The P-values are significant at 0.01. Thus, the hypothesis that the residuals are normally distributed is rejected. In addition, the significant result of the Cook–Weisberg test indicates the existence of heteroscedasticity.

Table 4: Tests for the OLS assumptions

Tests	Model (1) Unsystematic Risk	Model (2) Systematic Risk	Model (3) Total Risk
Variance inflation factor	< 2	< 2	< 2
Shapiro–Wilk W test	0.81381***	0.97281***	0.77598***
Shapiro–Francia W' test	0.80974***	0.97688***	0.77334***
Cook–Weisberg test	2.72*	3.66*	17.82*
Jarque–Bera test	56.24***	22.35***	66.96***
Interquartile range test	Yes***	No	Yes***
No. of Observations	415	415	415

*** Significant at 0.01 (two-tailed), ** significant at 0.05 (two-tailed), and * significant at 0.10 (two-tailed)

According to Shahwan (2015), the violation of the two main assumptions of OLS – namely, the normality and homoscedasticity of the residuals – implies that the LAV regression can be a good alternative to the OLS estimation.

Table 5 presents the estimated coefficients using LAV regression for the study variables as defined in Equations (3), (4) and (5). The coefficient of concentration ownership has a significant positive association with a firm's unsystematic risk (ß1 = 0.0051, P-value < 0.10). This positive influence is in line with studies conducted by (Rossetto and Staglianò, 2016), and (Felício, et al., 2018). However, the impact of a higher level of ownership concentration has a negative association with a firm's systematic risk (α1=-0.4475, P-value < 0.10). A possible explanation for

this is that the concentrated shareholders as external monitors are highly motivated to effectively manage a firm's systematic risk through asset allocation. Following John, et al. (2008) Matić and Papac (2014) and Rossetto and Staglianò (2016) this finding implies that managers should shed a special attention on a firm's specific risk (idiosyncratic risk) in the existence of a high level of ownership concentration, particularly in the lack of diversification. Accordingly, H1 is not fully supported.

Table 5: Corporate governance and firm risk: LAV regression results

Explanatory Variables and Expected Sign	Model (1)	Model (2)	Model (3)
	Unsystematic Risk (UNRISK)	Systematic Risk (SYSRISK)	Total Risk (TRISK)
Constant	0.0414 (4.94)***	1.1328 (1.53)	0.0425 (5.86)***
CON (+)	0.0051 (1.69)*	-0.4475 (-1.68)*	0.0013 (0.48)
2nd LSHOLD (+)	0.0016 (0.18)	-0.7962 (-0.99)	0.0049 (0.63)
INSOWN (-)	-0.0062 (-1.61)	-0.1791 (-0.53)	-0.0065 (-1.96)**
STOWN (+)	-0.0032 (-1.30)	-0.1161 (-0.53)	-0.0034 (-1.61)
MOWN (+)	-0.0014 (-0.37)	0.6137 (1.9)*	0.0005 (0.14)
FAMOWN (+)	-0.0015 (-0.29)	-0.4279 (-0.94)	-0.0019 (-0.43)
FSIZE (-)	-0.0012 (-3)***	0.0067 (0.19)	-0.0009 (-2.92)***
LEV (+)	2.32e-06 (0.06)	0.0004 (0.1)	2.34e-06 (0.07)
ROA (-)	-0.0035 (-0.64)	-1.1150 (-2.34)**	-0.0111 (-2.37)**
Fage (-)	0.00006 (0.59)	-0.0046 (-0.49)	-0.0002 (1.62)
SGROW (+)	0.0009 (1.5)	0.0241 (0.45)	0.0006 (1.20)
Pseudo R² (%)	8.44	14.74	9.88
Number of observations	415	415	415

Values in parentheses are *t*-values, ***, **, * indicate significance at 0.01, 0.05, and 0.10, respectively.

The institutional ownership and a firm's total risk have a significant negative relationship ($\gamma 1$= -0.0065, P-value < 0.05). This implies that increasing the shareholding percentage by institutional investors

reduces and stabilizes the volatility of the firm's stock prices. Hence, it will reduce the firm's total risk. This negative influence of institutional ownership on a firm's total risk is in line with studies conducted by (Aggarwal and Rao, 1990), (Cheng, et al., 2014), and (Vo, 2016). This finding confirms the role of institutional ownership in stabilizing the stock return volatility, particularly in an emerging market like Egypt. This negative association between institutional investors and firm's risks is due to the active role of those investors as pressure-sensitive or pressure-resistant investors. Such role might raise the target firm's sensitivity against risk-taking activity and, in turn, efficiently control managers' discretionary decisions. In this context, (Wright, et al., 1996) (Li, et al., 2006) and (Jara-Bertin, et al., 2012) confirmed the role of institutional investors as efficient external monitors who reduce the moral hazard behavior of managers. As argued by (Rubin and Smith, 2009), a high level of institutional investors might prevent speculation on the money of others. Accordingly, H2 is fully supported.

The coefficient of managerial ownership factor ($\alpha7= 0.6137$, P-value < 0.10) positively influenced a firm's systematic risk, implying that a higher percentage of managerial ownership means greater systematic risk. This is consistent with the results of (Chun and Lee, 2017). Accordingly, the results partially confirm H4.

Among the ownership structure characteristics, the coefficients of state ownership and family ownership are all statistically insignificant. The findings are inconsistent with (Langit and Adhariani, 2017). Thus, the results did not confirm either H3 or H5. Of the five independent control variables analyzed, the coefficients of firm size have significant negative effects on both a firm's unsystematic risk and its total risk ($\beta9$ = -0.0012; $\gamma9$ = -0.0009, P-value < 0.01). This indicates that larger firms are less risky, which is consistent with the results of (Vo, 2016) and (Chakraborty, et al., 2019). The sign for the coefficients of ROA are as expected. They have significant negative impacts ($\alpha11$ = -1.1150, $\gamma11$ = -0.0111, P-value < 0.05) on a firm's systematic and total risk. This indicates that higher profitability enhances the alignment between shareholders' and managers' interests, thereby leading to lower risk-taking. The other control variables, including LEV, Fage, and SGROW,

have no statistically significant association with different types of firm risk. Finally, testing the normality of the LAV residuals of the designated three models has been applied using Jarque-Bera test. The findings are as follows: ($\chi 2$ for model 1 = 0.1411); ($\chi 2$ for model 2 = 0.1211); and ($\chi 2$ for model 3 = 0.1841). These findings imply that there is no violation of the normal distribution assumptions of the LAV residuals. Moreover, the Ljung-Box-Pierce Q statistics of the LAV regression's squared residuals, at lag = 5, in the designated three models are 10.12, 6.10, and 14.74, respectively. This implies that the residuals are uncorrelated at the 95 percent confidence level. At the same time, the results of Engle's ARCH test on the residuals of the three models are 11.03, 9.62, and 13.03, respectively. The insignificant results at 5 percent level imply the absence of conditional heteroscedasticity in the residuals of the LAV regression.

6. CONCLUSIONS AND IMPLICATIONS

Many attempts have been made with the purpose of exploring the association between ownership structure practices and a firm's risks. However, their findings particularly in the emerging markets are not conclusive. Therefore, this study used agency theory to explore the ownership structure mechanisms within Egyptian listed firms and to examine whether these practices can be useful for controlling and reducing the firm's risk. Based on the least absolute value estimator, our findings reveal that only three ownership structure mechanisms – institutional ownership, ownership concentration, and managerial ownership – had a significant impact on the firm's risks. These results shed light on a number of implications for theory and practice as follows:

− The existence of a negative and significant association between institutional ownership and a firm's total risk illustrates the active role of institutional investors in controlling and reducing the firm's risks within the Egyptian context. Thus, in order to guarantee the continuity of this active role of institutional investors in providing the legal protection of shareholders' interests, substantial efforts related to government policy in Egypt should ensure and support the

existence of a high level of institutional ownership as a mandatory practice.

− The results show a significant negative relationship between ownership concentration and the firm's risks, in terms of systematic risk. However, this factor has a significant positive impact on a firm's unsystematic risk, which is consistent with the agency problem hypothesis. One possible explanation, as noted by (Maurović and Hasić, 2013) and (Felício, et al., 2018), is that the larger concentration of shareholdings increases the alignment of interests between shareholders and managers, despite the potential expropriation of minority shareholders, thereby motivating managers' behavior for risk-taking and positively affecting a firm's unsystematic risk. These results clearly show the need to adopt and develop additional internal control mechanisms to prevent any potential expropriation of minority shareholders' interests.

− This study's findings reveal the significant positive association between managerial ownership and a firm's systematic risk. The existence of a large percentage of insider ownership contributes to a better alignment of interests between managers and shareholders, thereby leading to higher risk-taking. As noted by (Chakraborty, et al., 2019), the presence of insider ownership mitigates agency problems related to risk-taking. This underlies the necessity for reinforcing the current regulations concerned with protecting investors in order to neutralize any potential adverse effect of increasing the level of insider ownership (managerial ownership), particularly within the Egyptian context.

− The results of this study do not support this expectation as there is no significant association between state ownership and different types of the firm's risks. One possible explanation is that firms with a high level of governmental ownership tend to be more conservative in relation to risk-taking. Ensuring social stability and welfare, rather than profit maximization, might be the first priority for these firms. Thus, adding new requirements regarding state ownership practices, such as codes of conduct, might be useful for enhancing the control of different types of risks.

− This study's findings show no association between family ownership and the firm's risks. This result is contrary to the expectation because of the low level of family ownership percentage in this study's data set. Thus, practitioners in Egypt should develop their financing strategy in a way that enhances the role of family ownership in managing the firm's risks.

Overall, the empirical results strongly suggest the impact of some CG mechanisms related to ownership structure on the firm's risks. However, this study's results are not comprehensive as they are based on annual reports covering financial statements from only five years. Therefore, increasing the sample size as a potential extension of future studies would enrich the results. These findings also suggest the following direction for future research by exploring the difference between family ownership and family management, and their impact on a firm's risk, corporate capital structure strategy, and the firm's value. Additional fruitful extension of the current study would be to investigate the effect of different CG mechanisms, such as structure of the board of directors, female board of directors, compensation mix, CEO duality, meetings frequency, audit and nomination committees and director age on the firm's risks.

Notes:

[1] Based on the ownership identity of Chinese commercial banks, banks are classified into three categories: government-controlled banks (GCBs), state-owned enterprises-controlled banks (SOECBs), and privately controlled banks.

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ملخص البحث باللغة العربية

تهدف هذه الدراسة إلى إختبار أثر آليات هيكل الملكية كأحد محددات جودة حوكمة الشركات على مخاطر الشركة، حيث تم إستخدام ثمانية متغيرات كمقاييس لممارسات هيكل الملكية بالشركات محل الدراسة. وتشتمل عينة الدراسة علي معظم الشركات غير المالية المدرجه بالبورصة المصرية خلال الفترة (2014م- 2018م)، حيث تم الإعتماد على طريقة أقل قيمة مطلقة أو مايعرف بطريقة الإنحرافات المطلقة الأقل لإختبار أثر آليات هيكل الملكية. وأظهرت نتائج الدراسة تأثير إيجابي معنوى لدرجة تركيز هيكل الملكية على مخاطر الشركات الغير منتظمة، بينما تؤثر سلبياً على المخاطر المنتظمة، كما توجد علاقة سلبية معنوية بين الملكية المؤسسية والمخاطر الكلية لشركات عينة الدراسة، ومن الناحية الأخرى توجد علاقة إيجابية بين الملكية الإدارية والمخاطر المنتظمة، كذلك يؤثر حجم الشركة تأثيراً سلبياً معنوياً على كلا من المخاطر الغير منتظمة والمخاطر الكلية، فضلاً عن وجود علاقة سلبية بين مؤشر العائد على الأصول وكلاً من المخاطر المنتظمة والمخاطر الكلية، وفي هذا الصدد تساعد نتائج هذه الدراسة كلاً من الإدارة ومتخذي القرار على فهم آليات هيكل الملكية وتعديلها بما يضمن الإدارة الفعالة لمخاطر الشركات والحد منها على نحو أفضل.

الكلمات المفتاحية: هيكل الملكية & مخاطر الشركات & المخاطر غير المنتظمة & المخاطر المنتظمة & المخاطر الكلية & مصر.

Suggested Citation according to APA Style