



## The relationship between risk assessment and the financial performance of the firms in Egypt during covid 19

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## **The relationship between risk assessment and the financial performance of the firms in Egypt during covid 19**

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### **ABSTRACT:**

Risk assessment is one of the five components of internal controls that plays an important role in organizational performance, as well as financial performance, especially during covid 19. On the other hand, the fourth industrial revolution and big data have a great impact on the business environment that implies a lot of challenges and opportunities. Based on this, this study pursues to determine the impact of risk assessment on the financial performance of the firm and to establish the degree of influence of risk assessment on improving the firms' performance, in particular financial performance, during covid 19 in Egypt. The proposed model for measuring the influence of risk assessment on the financial performance of the firm is developed based on previous studies. The risk assessment is measured by the existence of the risk management department and the whistleblower policy and financial performance is measured by leverage, return on assets, profit per share, and the financial statement irregularities. The findings of the study reveal that there is a significant relationship

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between risk assessment and financial performance, besides, risk assessment is a vital tool to resist emergencies in the future. The results of the study show that Egyptian enterprises need to pay more attention to risk assessment to improve their financial performance in consideration of the control environment.

**Keywords:** Risk Assessment – Control Environment – Internal Control over Financial Reporting – Financial Performance – covid 19

## **1 – Introduction:**

The world is facing the coronavirus pandemic (COVID-19), which is the most serious global epidemic in decades, and it provides the business world with an opportunity to try out new digital techniques, therefore, many organizations and institutions have used a variety of algorithms in conjunction with other information and communication technologies (ICTs) to track infectious party interactions, assess risk, and make governance decisions (Liu,2021).

Furthermore, in recent years, the rapid development and advancement of information technology (IT) have amplified ubiquitous data collection at an unprecedented rate (Chen, Hsu, & Hu, 2021). Although the use of big data has brought many benefits, it has also brought with it a slew of new obstacles and concerns, particularly in today's extremely volatile environment (Chen, Hsu, & Hu, 2021). Thus, enterprise risk management (ERM) is also required to improve managers' and boards

of directors' abilities to manage risk and monitor corporate risks (Beasley et al., 2005) and it is important to enhance data and information protection.

Risk assessment is a crucial component of risk management which is the process of identifying, measuring, and determining how to succeed (ENDESHAW, 2021). Risk assessment is also one of the five components of the internal control system.

The internal control system plays a critical role in attaining the firm's goal and objectives, resulting in good value for money (Kinyua, 2016). Despite, for many CEOs, internal controls make "processes and structures stagnant and inflexible" (PricewaterhouseCoopers 2012), internal controls over financial reporting (ICFR) are positively related to company operations (Feng, Li, McVay, and Skaife 2015; Cheng, Dhaliwal, and Zhang 2013; Skaife, Veenman, and Wangerin 2013). To elaborate, internal control over financial reporting has a positive impact on the quality of information available to managers, and consequently, leads to favorable operational outcomes because ICFR may improve the information environment, allowing internal decision-makers to make more informed risk-taking decisions, hence, internal control quality can improve the information environment while also limiting decision flexibility (Baugh, Ege, & Yust, 2021).

Organizations with strategic resources, according to the resource-based approach, have a competitive edge over other organizations

(Barney, 1991). Strategic resources are defined by particular characteristics, such as the presence of important resources that can boost an organization's effectiveness while fending off risks to its growth (Abisola, 2022). Hence, internal control is considered for this study because it is how an organization's assets, valuables, and properties are used, documented, quantified, and controlled, and it plays a critical role in the prevention and detection of error and fraud as well as protection of the organization's physical and financial resources (Rezaee, 2005).

Thus, there is a research gap regarding the consequences of covid 19 on the business environment as well as the impact of the fourth industrial revolution and big data that requires more research in risk assessment. This study aims to fill the research gap by answering the question: what is the impact of risk assessment on the financial performance of the firms in Egypt during covid 19?

As a result, the main objective of the study is to identify and examine the relationship between the risk assessment and the financial performance in Egypt with consideration of the control environment.

Hence, the subobjectives of the study can be indicated as follows:

- To determine the relationship between risk assessment and leverage.

- To determine the relationship between risk assessment and return on assets.
- To determine the relationship between risk assessment and profit per share.
- To determine the relationship between risk assessment and financial statement irregularities.
- To explore the impact of the control environment on the relationship between risk assessment and financial performance.

Our study contributes to the literature by examining whether and how risk assessment affects the financial performance of the firm during covid 19.

The rest of the paper is organized as follows. Section 2 establishes the literature review and hypotheses development. Section 3 explains the research design and methodology followed by data analysis in section 4. Conclusions and recommendations are illustrated in the final section.

## **2- Literature Review:**

### **2.1 Internal control over financial reporting:**

Internal control is defined as the "process effected by an entity's board of directors, management, and other personnel designed to provide reasonable assurance regarding the achievement of objectives related

to operation, reporting, and compliance" by the COSO Internal Control Framework (2013). And IAASB (2018) also defines internal control as a process designed, implemented, and maintained by those in charge of governance, management, and other personnel to provide reasonable assurance about an entity's objectives in terms of financial reporting reliability, operational effectiveness and efficiency, and compliance with applicable laws and regulations.

Management should have an information system in place that allows for the timely, relevant, and trustworthy dissemination of information to stakeholders, as well as the free flow of information between management and staff (Asiligwa & Rennox, 2017). Internal controls affect financial results by reducing risk, eliminating theft and mistakes that could lead to material errors, encouraging the efficacy and efficiency of operations, providing accurate, complete, and timely decision-making information, and ensuring compliance with laws and regulations (HANOON, et al., 2021)

In other words, management is responsible for the preparation and fair presentation of financial statements, including adequate disclosure, following the applicable financial reporting framework, as well as for any internal control that management deems necessary to enable the preparation of financial statements free of material misstatement, whether due to fraud or error ( IAASB, 2018). It means that the establishment and maintenance of adequate internal control over

financial reporting is the responsibility of the company's management and it also should be overseen by the president and chief executive officer and chief financial officer ( Arens, et al., 2012).

As we mentioned before, an internal control system in a business is the policies and procedures that give management reasonable assurance that the organization has met its objectives and goals and consequently, internal control over financial reporting is a set of procedures that aims to offer reasonable assurance about the accuracy of financial reporting and the preparation of financial statements for external purposes in compliance with applicable financial reporting framework (Arens, et al., 2012). Then, internal control plays a fundamental role in the reliability of information included in financial reporting.

Internal controls are classified by the International Accounting Standards (IAS) as a plan of organization, segregation of duties, document control, asset safeguarding, staff competence, arithmetic and accounting controls, recording and record-keeping, supervision, authorization and approvals, vocation and rotation of duties, cost feasibility, routine and automatic checks (Asiligwa & Rennox, 2017). For more details, internal control over financial reporting refers to policies and procedures that (1) pertain to the maintenance of records that accurately and fairly reflect the company's transactions and dispositions of assets in reasonable detail; (2) provide reasonable



assurance that transactions are recorded as necessary to permit the preparation of financial statements following generally accepted accounting principles, and that receipts and expenditures are recorded as necessary to permit the preparation of financial statements under generally accepted accounting principles ( Arens, et al., 2012).

The responsibility of the company's management is not only the establishment and maintenance adequate internal control over financial reporting but also extends to include the evaluation of the effectiveness of the company's internal control over financial reporting through two steps: evaluating the design of internal control over financial reporting and testing the operating effectiveness of internal controls ( Arens, et al., 2012). For the first step, it requires to assess of whether the controls are developed and implemented in a way that prevents or detects substantial financial statement misstatements and the focus is on the risks related to the significant accounts and disclosures in the financial statements as well as how significant transactions are initiated, authorized, recorded, processed, and reported in order to pinpoint points in the transactions flow where material misstatements due to error or fraud may occur ( Arens, et al.,2012). On the other hand, the next step is to determine if the controls are working as they should and if the person executing the control has the authority and qualifications to do so effectively ( Arens, et al., 2012).

Effective internal control over financial reporting requires to plan and conduct regular seminars and workshops to educate managers, in every level, and staff in the finance, accounting, and internal audit departments about internal controls, policies, and procedures to improve their professional skills, knowledge, and practices (Asiligwa & Rennox, 2017).

## 2.2 Financial performance

Performance is the ability to function efficiently, profitably, survive, grow, and respond to environmental opportunities and dangers (Mawanda,2008) and financial performance is a monetary measure of a company's policies and activities (Kinyua, 2016) which is a method of calculating the financial effects of a company's arrangements and operations (Whittington & Pany, 2001). In other words, financial performance is a subjective assessment of a company's ability to create revenues by utilizing resources from its core business model (Ejoh & Ejom, 2014). Hence, financial performance is considered a broad indicator of a company's overall financial health over a time that can be used to determine if a company has gotten the most value out of the items and services it buys and/or offers, given the resources it has, besides, it's a vital criterion to compare similar companies in the same industry or to compare industries or sectors in aggregate (Ahmed, & Muhammed, 2018; Kinyua,2016). For positive financial performance, a company pursues to eliminate waste in benefits

services processes and systems and the degree to which a company achieves its defined objectives and mission in terms of efficiency, effectiveness, and economy is the main success factor, whereas efficiency refers to the maximizing of output, effectiveness is the achieving all desired outcomes, and economy is related to the cost minimization (Kinyua,2016).

In summary, financial performance can be defined as a measure of a company's overall financial status, based on important financial measures such as return on assets and return on equity besides, financial ratios obtained primarily from the balance sheet, income statement, and cash flow statement (Adam, 2014).

In setting business goals, the internal control system and financial performance were statistically significant (Muraleetharan, 2011). Both the control systems and financial performance measures have a degree of interdependence on each other. The control systems oversee the implementation of strategic objectives by checking the organization's position, communicating the position, verifying priorities, and compelling progress (Endeshaw, 2021). So, control system is based on the measurement and evaluation of performance, which answers three questions: what happened, why it happened, and what should be done about it which is meant that financial performance offers short-term input to the control systems and as a result, internal

controls can be viewed as a means to an end, whereas financial performance is the goal ( Endeshaw, 2021).

On the other hand, internal control systems play a critical role in attaining the firm's goal and objectives, resulting in control over the utilization of resources by the company to meet its goals which is referred to good value for money, by providing sound structures for planning, assessing, authorizing, and regulating operations (Kinyua,2016), besides, the establishment and implementation of control activities will aid managers in minimizing risks while managing corporate activities (Tuan, 2020) as well as in handling financial reporting, and compliance with laws and regulations (Whittington and Pany, 2001). In addition, internal control systems are designed to improve the reliability of financial performance either directly or indirectly by increasing accountability among information providers in a business (Jensen, 2005). In summary, Internal control over financial reporting includes both accountability and regulatory compliance that will lead to a more secure working environment as well as more opportunities for productivity (Eniola, 2021).

### **2.3 The relationship between internal control over financial reporting and financial performance:**

Several researchers have done research into how internal control affects financial performance. A great portion of these studies has focused on the banking sector.

Asiligwa & Rennox, (2017) and HANOON, et, al, (2021) have researched the effect of internal controls on the financial performance of commercial banks in Kenya and Iraqi respectively. Based on the findings of both studies, elements of internal controls significantly influence the financial performance of commercial banks. The study of Asiligwa & Rennox, (2017) has also revealed that, in Kenya, the large banks had comparatively better financial performance than the medium and smaller banks. This study has focused on the profitability and has used return on equity (ROE) to proxy the measurement of financial performance and the other measures of financial performance such as return on assets (ROA), return on sales (ROS), and net interest margin (NIM) have not been considered in this study. On the other hand, the study of HANOON et al. has found that, for the five components of internal controls, the control activity has the largest effect on financial performance. The study also revealed that the weakness of internal control in the banking sector in Iraqi creates its poor financial performance and as a result, the researchers have recommended that it is necessary to take action for developing the internal controls in the banking sector. This research has focused on ROE, ROA, and ROS to measure financial efficiency.

Also, Rapani and Malim (2020) concluded that the internal control systems of Iraqi banks are weak, and the study revealed that there is a considerable link between internal control and financial performance

of the bank. This study used a literature review strategy to investigate the relationship between internal control coefficients and bank financial performance in Iraq. From 2013 to 2019, the study compared, and summarized studies published in respected journals.

Umar and Dikko (2018) conducted a study on the impact of internal controls on the performance of commercial banks in Nigeria, distributing questionnaires to bank employees. According to the survey's findings, internal control and bank financial performance have a favorable and significant association.

Baugh, Ege, & Yust, (2021) investigated if and how the quality of bank internal controls influences performance through risk-taking. The study discovered that banks that reveal a major deficiency in internal controls take on more risk and perform worse in the future, including a larger (lower) possibility of severe losses (gains). Additionally, internal control quality affects both core and non-core activities of banks, since material weaknesses of internal controls are negatively associated with the total assets, loans, interest income, and non-interest revenue growth. Overall, the findings indicate that effective internal controls boost bank risk-taking, in part by asymmetrically lowering downside risk while encouraging upside risk-taking, resulting in improved bank performance.

On the other hand, Abisola, (2022) investigated the role of internal control sufficiency in moderating the relationship between bank size

and financial performance of Nigeria's listed Deposit Money Banks. The findings revealed that the proxies for bank size (total assets, number of workers, and customers' deposits) had a cumulative influence on financial performance and internal control sufficiency was found to boost the influence of bank size on financial performance as a moderating variable. The return on asset (ROA) was captured using a single measure of financial performance and the study did not use other variables such as total asset turnover, return on equity, and debt to equity ratio to evaluate the financial performance.

Many studies focused on the weaknesses in internal controls and material weaknesses in internal control over financial reporting are used as a proxy for internal controls. Some of these studies found that material weaknesses in internal control over financial reporting are linked to low accrual quality, and taking actions to remedy them lead to better accrual quality (Ashbaugh–Skaife, et al., 2008; Doyle, Ge, and McVay 2007). Other studies concluded that there is a positive relationship between material weaknesses in internal control over financial reporting and both the cost of equity (Ashbaugh–Skaife et al., 2009) and the cost of debt (Dhaliwal, et al., 2011; Kim, Song, and Zhang, 2011) as well as potential fraud (Donelson, Ege, and McInnis 2017). Feng et al., (2015) found that inventory–related material weaknesses in internal control have a detrimental impact on the firm operations and business operations are improved when the internal

control deficiencies are remedied because controls can be used for both financial and operational goals that due to good internal control over financial reporting can increase the quality of the information provided to managers while also limiting the potential to make suboptimal decisions. In addition, investment efficiency improves after the disclosure of material weaknesses in internal control because of the improvement in information quality as a result of the disclosure (Cheng et al., 2013).

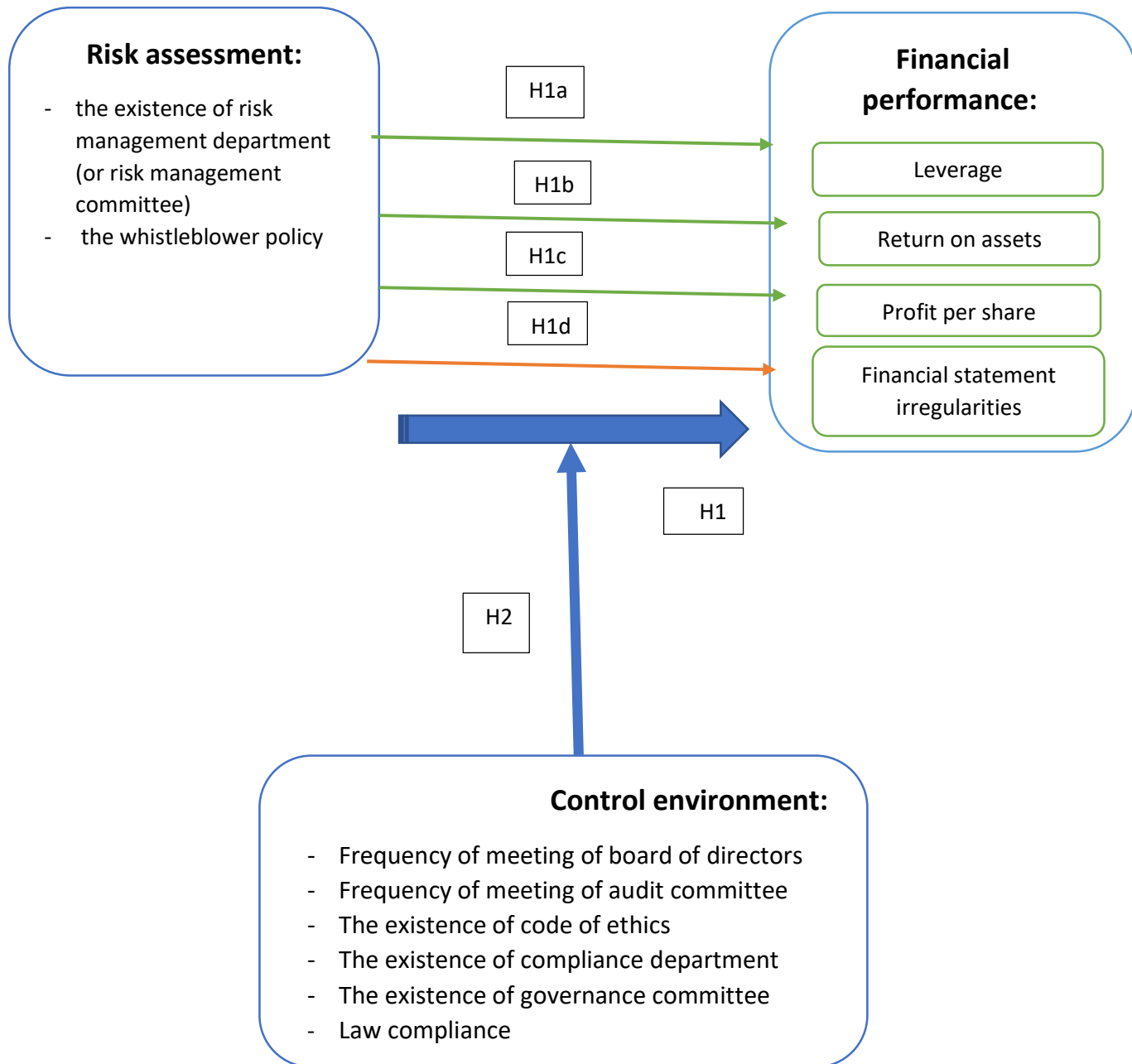
#### **2.4 Hypotheses development:**

Despite prior researchers offering considerable contributions to the literature, they have relied heavily on the questionnaire to collect data about internal control systems. They also did not focus on the risk assessment despite its importance in the business world that increased recently as a result of both COVID-19 and the rapid development and advancement of information technology (IT).

The internal control system includes five components: the control environment, risk assessment, control activities, information and communication, and monitoring. (COSO, 2013). The focus of this study is on the risk assessment besides, the control environment as it is the tone at the top and it is also the foundation for the other four control components.

The proposed model for measuring the relationship between risk assessment and financial performance in consideration of the control environment was developed based on previous studies about the internal control over financial reporting, financial performance, and the relationship between internal control, and financial performance. The model can be designed as follow:





Therefore, the hypotheses are stated in the following sentences:

**H1: Risk assessment positively affects financial performance of the firm.**

**H1a:** Risk assessment positively affects Leverage of the firm.

**H1b:** Risk assessment positively affects Return on assets of the firm.

**H1c:** Risk assessment positively affects Profit per share of the firm.

**H1d:** Risk assessment negatively affects financial statement irregularities of the firm.

**H2: The control environment moderates the relationship between risk assessment and financial performance.**

### **3–Methodology:**

Financial performance is the dependent variable that is affected by the independent variable risk assessment and control environment is the moderator variable of this relationship. Leverage, return on assets (ROA), profit per share and financial statement irregularities are used to proxy the measurement of financial performance. To measure risk assessment the study relies on the existence of the risk management department (or risk management committee) and the whistleblower policy. Because all aspects that are successful in deciding, increasing, or lowering the effectiveness of rules, procedures, and methods

particular to a process are referred to as the control environment, the study measure the control environment by using the frequency of meeting of the board of directors, frequency of meeting of the audit committee, the existence of code of ethics, the existence of compliance department, the existence of governance committee, and law compliance.

The research design for this study is to use historical data to predict the current behavior of the variables of the study. Secondary data was obtained from the financial reporting and governance reports of the listed business from 2018 to 2020. The population of this study is the listed firms in Egypt.

The consistency and integrity of the data collected were checked. Verification of accuracy, uniformity, and completeness was undertaken before the final analysis was done thoroughly and scrupulously to enhance validity and reliability.

#### **4– Data Analysis, Results and Discussion:**

Table 1 presents the three variables employed by the study and its measurements. The variables include three types: dependent variable (Financial Performance), independent variable (Risk Assessment), and moderator variable (Control Environment) that affects the relationship between the two variables dependent and independent.

Table 1. Variables and measurement.

	Measurement	
<b>Dependent (Financial Performance)</b>	<b>leverage</b>	<b>Leverage</b>
	<b>ROA</b>	<b>Return on assets</b>
	<b>ppshare</b>	<b>Profit per share</b>
	<b>FSI</b>	<b>financial statement irregularities</b>
	<b>CRM</b>	<b>the existence of risk management department (or risk management committee)</b>
	<b>ROI</b>	<b>the whistleblower policy</b>
<b>Moderator (Control environment)</b>	<b>NBM</b>	<b>frequency of meeting of board of directors</b>
	<b>NMRC</b>	<b>frequency of meeting of audit committee</b>
	<b>CEB</b>	<b>The existence of code of ethics</b>
	<b>CM</b>	<b>the existence of compliance department</b>
	<b>GC</b>	<b>the existence of governance committee</b>
	<b>TOL</b>	<b>Law compliance</b>

#### 4.1 Verify the validity of data for statistical analysis:

##### A. Normal distribution test:

The importance of the normal distribution test stems from the extent to which the study data follow the normal distribution so that we can conduct the parameter tests of the study, which amounted to 96 sample for the study variables, where this study was applied to 32 companies within three years, the period (2018 to 2020), and the following are the results of the test> Shapiro–Wilk Test

It is a statistical test in which the null hypothesis is the belonging of the studied sample to a population distributed naturally according to the studied variable, compared to other tests that aim to verify the normal distribution, Shapiro's test is known to be appropriate for small samples (less than 0.05), the test was defined by statisticians American Samuel Shapiro and Canadian Martin Welk in 1965.

Figure 1: Testing the Normal distribution of variables

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
leverage	96	0.80794	15.327	6.042	0.00000
Roa	96	0.87426	10.034	5.104	0.00000
Ppshare	96	0.68029	25.513	7.170	0.00000
NBM	96	0.93002	5.585	3.807	0.00007
NMRC	96	0.83223	13.389	5.742	0.00000
CEB	96	0.94197	4.631	3.392	0.00035
CM	96	0.95320	3.735	2.917	0.00177
GC	96	0.55766	35.299	7.888	0.00000
TOL	96	0.92108	6.298	4.073	0.00002
CRM	96	0.77856	17.672	6.357	0.00000
ROI	96	0.96981	2.409	1.946	0.02583
IAC	96	0.93421	5.250	3.670	0.00012

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Source: Stata v15 Outputs

The previous table shows Shapiro–Wilk Testing on study variables, where we accept  $H_0$  when significant less than 5%, given the following:

$H_0$ : Variables follow the normal distribution

H1: Variables do not follow the normal distribution

From the previous table all variables follow the normal distribution, depending on Shapiro's test, and the level of significance is less than (0,05), which means all variables are distributed according to the normal distribution according to the theory and thus accepting the null hypothesis: that the data follow the normal distribution, and reject the alternative hypothesis: that the data do not follow the normal distribution.

### B. Multicollinearity and autocorrelation test:

Multicollinearity and autocorrelation testing were used to test the powers of study data for statistical analysis as in the following table:

Table 2: Multicollinearity and Autocorrelation test

Variables	Multicollinearity	
	Tolerance	VIF
leverage	0.7728	1.30
ROA	0.9278	1.20
ppshare	0.7789	1.31
FSI	0.763	1.00
CRM	0.456	1.08
ROI	0.875	1.23
NBM	0.8623	1.17
NMRC	0.8517	1.16
CEB	0.9435	1.15
CM	0.8295	1.08
GC	0.869	1.06
TOL	0.958	1.04

Source: Stata v15 Outputs

The previous table shows the results of the Multi-collinearity Test linear interference test through the collinearity diagnostics scale based on two indicators:

- Variance Inflationary Factor and there is inflation by this indicator when the VIF value is greater than or equal to 5
- Tolerance endurance factor is a self-association problem by this indicator when it is worth less than 10%

According to the results shown in the previous table and an indication of the assumptions of the previous two indicators, it is clear that all the variables of the study passed these indicators.

#### **4.2 Tests hypotheses:**

According to the study model, the data will be analyzed using the panel data Method by using three models: Pooled Regression Model (PRM), Fixed Effects Model (FEM), and Random Effects Model (REM). To choose between which of these models should be chosen, and used in the analysis, two tests will be applied: the first is called the proposed Lagrangian Multiplier Test (LM) by Breusch and Pagan (1980) to choose between PRM, FEM or REM. The second is called the proposed Hausman H Test (1978), and is used to choose between FEM and REM.

**Tests hypotheses 1:**

H1: Risk assessment positively affects the financial performance of the firm.

**The Main H1 Hypothesis: Risk assessment positively affects the financial performance of the firm.**

To test the hypotheses of the study, the quality test of the study model is performed to ensure the quality of the model's outputs where many tests have been performed, and then to view the results of the measurement models.

**H1a: Risk assessment positively affects the leverage of the firm.**

1) Normality of Residuals test:

Figure 2: Result of Normality of Residuals test

. swilk resid5

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
resid5	300	0.99285	1.523	0.988	0.16151

Source: Stata v15 Outputs



The previous table shows a test to ensure that Residuals have a normal distribution, and the prob's value for the linear regression model is = 0.16151, which is greater than 5%, Accordingly, accepted the null hypothesis H0: Residuals follow the normal distribution, and reject H1: Residuals do not follow the normal distribution, which is a good indicator of the quality of the model.

## 2) Residuals Heteroskedasticity Test

Figure 3: Heteroskedasticity Test

```
. hettest  
  
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity  
Ho: Constant variance  
Variables: fitted values of leverage  
  
chi2(1)      =      1.69  
Prob > chi2  =      0.1932
```

Source: Stata v15 Outputs

The result of the Residuals Heteroskedasticity Test in the previous table indicated that prob = 0.1932, which is greater than 5%, Accordingly there is no problem with residuals Heteroskedasticity, which means accepted the null hypothesis There's no Heteroskedasticity in the residuals, and reject Alternative hypothesis

### 3) The model results

To determine the best model between a pooled regression model or (fixed effects model and a random effect model) We're going to use the Lagrangian test.

- **Lagrangian Multiplier Test**

Figure 4: **Results of a Lagrangian Multiplier Test**

Breusch and Pagan Lagrangian multiplier test for random effects

$$\log\_EVA[CID,t] = Xb + u[CID] + e[CID,t]$$

Estimated results:

	Var	sd = sqrt(Var)
log_EVA	.6550403	.8093456
e	.1340972	.3661928
u	.1699237	.412218

Test: Var(u) = 0

chibar2(01) = 160.45  
Prob > chibar2 = 0.0000

Source: Stata v15 Outputs

The test results show that prob Lagrangian Multiplier is = 0.000, which is less than 0.05.

- null hypothesis: FEM or REM regression models will be better than PRM.

- alternative hypothesis PRM regression will be better than both FEM and REM.

from the results, we accepted the null hypothesis and reject the alternative hypothesis therefore the best model is FEM or REM.

- **Hausman test**

Hausman test used for choosing between fixed effects model (FEM) and random effects model (REM), the following table shows test results:

Figure 5: Hausman test Result

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. hausman fe re
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	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) fe	(B) re		
CRM	-.2432844	1.035071	-1.278355	.3176928
ROI	-.0211463	-.345873	.3247268	.329474

b = consistent under Ho and Ha; obtained from xtreg  
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

```
chi2(2) = (b-B)' [(V_b-V_B)^(-1)] (b-B)
          =      16.47
Prob>chi2 =      0.0003
```

Source: Stata v15 Outputs

The results of the previous table show that the significant value of the Hausman test is = 0.0003, which is less than 5%,

- null hypothesis: no correlation between the fixed effects of companies.
- alternative hypothesis: there is correlation between the fixed effects of companies.

from the results we reject the null hypothesis and accepted the alternative hypothesis and therefore the best model is FEM.

- **fixed effects model (FEM)**

In order to determine the outcome of the initial sub-hypothesis, the study relied on multiple regression analysis, the value of Sig F was relied upon to accept or reject the study model and to determine its appropriateness in representing the relationship between independent variables and the dependent variable, where the decision rule indicates that the model is accepted when the Sig F value is less than 0.05, and the calculated F value must be higher than its scheduled value. In order to determine the impact of each of the independent variables separately on the child variable, the Sig Z value was relied upon, as the rule of resolution states that there is an effect when the absolute value of the Z deducted is higher than its scheduling value at the Sig Z morale level below 0.05, in order to accept the hypothesis and reject the alternative, and to indicate the accuracy of the interpretation of the independent variables of the dependent variable, the value of the adjusted selection factor was relied upon. Adjusted R Square

Table 3: Results of fixed effects model (FEM)

leverage	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
CRM	.257	.735	2.35	.008	1.725	1.212	
ROI	.133	1.081	3.12	.003	2.294	2.029	
Constant	3.333	.808	4.13	0	1.718	4.947	0.00
Mean dependent var		3.176	SD dependent var			4.219	
R-squared		0.652	Number of obs			96	
F-test		1.465	Prob > F			0.000	
Akaike crit. (AIC)		383.343	Bayesian crit. (BIC)			391.036	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

Source: Stata v15 Outputs

The previous table shows the results of the multiple regression test of independent study variables (CRM – ROI) and dependent variables Leverage, and notes from the following results:

- There is a strong positive relationship between the independent variables (CRM – ROI), and Dependent variable (leverage), which can be represented by simple linear regression model of the following:

$$\text{Leverage} = 3.33 + 0.257 \text{ CRM} + 0.133 \text{ ROI}$$

**Which mean if the CRM increased by 100% and the Leverage level will increase by 25%. And When ROI increased by 100% and the Leverage level will increase by 13%**

- Significance of independent variables is (0.000) lower than (0.05), which mean the variable is statistically significant.

- The degree of significance regression model is proposed (0.00) is less than (0.05), which means that the model is statistically significant.
- Reached the coefficient of determination is  $R^2=65.2\%$ , which mean, 65.2% from changes in leverage because of the change in CRM and ROI.

Finally, the results and previous analysis confirm that there is a significant impact of risk assessment on leverage of the firm.

### **H1b:Risk assessment positively affects return on assets of the firm**

#### 1) Normality of Residuals test:

Figure 5: Result of Normality of Residuals test

```
. swilk resid2
```

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
resid2	96	0.94672	4.252	3.203	0.00068

Source: Stata v15 Outputs

The previous table shows a test to ensure that Residuals have a normal distribution, and prob's value for the linear regression model is = 0.000068, which is less than 5%, Accordingly, accepted the null hypothesis  $H_0$ : Residuals follow the normal distribution, and reject  $H_1$ :

Residuals do not follow normal distribution, which is a good indicator of the quality of the model.

## 2) Residuals Heteroskedasticity Test

Figure 6: Heteroskedasticity Test

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of Roa
chi2(1)      = 18.40
Prob > chi2  = 0.4233
```

Source: Stata v15 Outputs

The result of Residuals Heteroskedasticity Test in the previous table indicated that prob = 0.4233, which is greater than 5%, Accordingly there is no problem residuals Heteroskedasticity, which mean accepted the null hypothesis There's no Heteroskedasticity in the residuals, and reject Alternative hypothesis

## 3) The model results

To determine the best model between a pooled regression model or (fixed effects model and a random effect model) We're going to use Lagrangian test.

- **Lagrangian Multiplier Test**

Figure 7: Results of a Lagrangian Multiplier Test

```
. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

Roa[Cid,t] = Xb + u[Cid] + e[Cid,t]

Estimated results:

```

	Var	sd = sqrt(Var)
Roa	.0060052	.0774934
e	.0023652	.0486329
u	.0028706	.0535782

```

Test:  Var(u) = 0
      chibar2(01) = 25.98
      Prob > chibar2 = 0.0000

```

Source: Stata v15 Outputs

The test results show that prob Lagrangian Multiplier is = 0.000, which is less than 0.05.

- null hypothesis: FEM or REM regression models will be better than PRM.
- alternative hypothesis PRM regression will be better than both FEM and REM.

from the results we accepted the null hypothesis and reject the alternative hypothesis and therefore the best model is FEM or REM.



- **Hausman test**

Hausman test used for choosing between fixed effects model (FEM) and random effects model (REM), the following table shows test results:

Figure 8: Hausman test Result

```
. hausman fe re
```

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) fe	(B) re		
CRM	-.0033303	-.0073378	.0040075	.0027976
ROI	-.0549557	-.0573704	.0024146	.0171803

b = consistent under Ho and Ha; obtained from xtreg  
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

$$\text{chi2}(2) = (b-B)' [(V_b-V_B)^{-1}] (b-B)$$

$$= 2.21$$

Prob>chi2 = 0.3317

Source: Stata v15 Outputs

The results of the previous table show that the significant value of the Hausman test is = 0.3317, which is greater than 5%,

- null hypothesis: no correlation between the fixed effects of companies.
- alternative hypothesis: there is correlation between the fixed effects of companies.

from the results we accepted the null hypothesis and reject the alternative hypothesis and therefore the best model is REM.

- **Random effects model (REM)**

Table 4: Results of Random effects model (REM)

Roa	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
CRM	.007	.006	1.18	.039	.02	.005	
ROI	.057	.018	3.25	.001	-.092	-.023	0.00
Constant	.108	.017	6.54	0	.076	.141	
Mean dependent var		0.066	SD dependent var			0.077	
Overall r-squared		0.449	Number of obs			96	
Chi-square		11.323	Prob > chi2			0.003	
R-squared within		0.170	R-squared between			0.690	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

Source: Stata v15 Outputs

The previous table shows the results of the multiple regression test of independent study variables (CRM – ROI) and dependent variables Return on assets, and notes from the following results:

- 1) There is a strong positive relationship between the independent variables (CRM – ROI), and Dependent variable (Return on assets), which can be represented by simple linear regression model of the following:

$$\text{Return on assets} = 0.108 + 0.007 \text{ CRM} + 0.057 \text{ ROI}$$

Which mean if the CRM increased by 100% and the return on assets level will increase by 7%. And When ROI increased by 100% and the return on assets level will increase by 5%

- Significance of independent variables is (0.000) lower than (0.05), which mean the variable is statistically significant.
- The degree of significance regression model is proposed (0.00) is less than (0.05), which means that the model is statistically significant.
- Reached the coefficient of determination is  $R^2=44\%$ , which mean, 44% from changes in Return on assets because of the change in CRM and ROI.

Finally, the results and previous analysis confirm that There is a significant impact of risk assessment on return on assets of the firm.

### **H1c: Risk assessment positively affects profit per share of the firm**

#### 1) Normality of Residuals test:

Figure 9: Result of Normality of Residuals test

```
. swilk resid3
```

Shapiro-Wilk W test for normal data

Variable	Obs	W	V	z	Prob>z
resid3	96	0.71324	22.884	6.929	0.00000

Source: Stata v15 Outputs

The previous table shows a test to ensure that Residuals have a normal distribution, and prob's value for the linear regression model is = 0.0006, which is less than 5%, Accordingly, accepted the null hypothesis  $H_0$ : Residuals follow the normal distribution, and reject  $H_1$ :

Residuals do not follow normal distribution, which is a good indicator of the quality of the model.

## 2) Residuals Heteroskedasticity Test

Figure 10: Heteroskedasticity Test

```
. nltest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of Ppshare

chi2(1)      =      0.23
Prob > chi2  =      0.6351
```

Source: Stata v15 Outputs

The result of Residuals Heteroskedasticity Test in the previous table indicated that prob = 0.6351, which is greater than 5%, Accordingly there is no problem residuals Heteroskedasticity, which mean accepted the null hypothesis There's no Heteroskedasticity in the residuals, and reject Alternative hypothesis

## 3) The model results

To determine the best model between a pooled regression model or (fixed effects model and a random effect model) We're going to use Lagrangian test.

- **Lagrangian Multiplier Test**

Figure 11: Results of a Lagrangian Multiplier Test

```
. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

Ppshare[Cid,t] = Xb + u[Cid] + e[Cid,t]

Estimated results:

```

	Var	sd = sqrt(Var)
Ppshare	13.4398	3.666034
e	1.862097	1.364587
u	9.577484	3.094751

```

Test:  Var(u) = 0
      chibar2(01) =    55.72
      Prob > chibar2 =    0.0000

```

Source: Stata v15 Outputs

The test results show that prob Lagrangian Multiplier is = 0.000, which is less than 0.05.

- null hypothesis: FEM or REM regression models will be better than PRM.
- alternative hypothesis PRM regression will be better than both FEM and REM.

from the results we accepted the null hypothesis and reject the alternative hypothesis and therefore the best model is FEM or REM.

### •Hausman test

Hausman test used for choosing between fixed effects model (FEM) and random effects model (REM), the following table shows test results:

Figure 12: Hausman test Result

```
. hausman fe re
```

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) fe	(B) re		
CRM	.8749314	.6584889	.2164425	.299534
ROI	-2.072957	-.7001862	-1.37277	1.720373

b = consistent under Ho and Ha; obtained from xtreg  
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

$$\text{chi2}(2) = (b-B)' [(V_b-V_B)^{-1}] (b-B)$$

$$= 1.72$$

Prob>chi2 = 0.4236

Source: Stata v15 Outputs

The results of the previous table show that the significant value of the Hausman test is = 0.4236, which is greater than 5%,

- null hypothesis: no correlation between the fixed effects of companies.

- alternative hypothesis: there is correlation between the fixed effects of companies.

from the results we accepted the null hypothesis and reject the alternative hypothesis and therefore the best model is REM.

- **Random effects model (REM)**

Table 5: Results of Random effects model (REM)

Ppshare	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
CRM	.135	.193	4.70	.004	-.243	.512	
ROI	.011	.635	5.02	.006	-1.233	1.255	
Constant	1.468	.739	1.99	.047	.021	2.916	0.00
Mean dependent var		1.542	SD dependent var			3.666	
Overall r-squared		0.724	Number of obs			96	
Chi-square		2.495	Prob > chi2			0.001	
R-squared within		0.200	R-squared between			0.830	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

Source: Stata v15 Outputs

The previous table shows the results of the multiple regression test of independent study variables (CRM – ROI) and dependent variables profit per share, and notes from the following results:

- There is a strong positive relationship between the independent variables (CRM – ROI), and Dependent variable (profit per share), which can be represented by simple linear regression model of the following:

-

- **profit per share = 1.486 + 0.135 CRM + 0.011 ROI**

**Which mean if the CRM increased by 100% and the profit per share level will increase by 13%. And When ROI increased by 100% and the profit per share level will increase by 1%**

- Significance of independent variables is (0.000) lower than (0.05), which mean the variable is statistically significant.
- The degree of significance regression model is proposed (0.00) is less than (0.05), which means that the model is statistically significant.
- Reached the coefficient of determination is  $R^2=72\%$ , which mean, 72% from changes in profit per share because of the change in CRM and ROI.

Finally, the results and previous analysis confirm that there is a significant impact of risk assessment on profit per share of the firm.

#### **H1d: Risk assessment positively financial statement irregularities effects of the firm**

- Normality of Residuals test:

Figure 13: Result of Normality of Residuals test

```
. swilk resid4
```

Shapiro-Wilk W test for normal data					
Variable	Obs	W	V	z	Prob>z
resid4	96	0.58606	33.033	7.741	0.00000

Source: Stata v15 Outputs



The previous table shows a test to ensure that Residuals have a normal distribution, and prob's value for the linear regression model is = 0.0006, which is less than 5%, Accordingly, accepted the null hypothesis H0: Residuals follow the normal distribution, and reject H1: Residuals do not follow normal distribution, which is a good indicator of the quality of the model.

- Residuals Heteroskedasticity Test

Figure 14: Heteroskedasticity Test

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: fitted values of FSI

chi2(1)      =      1.95
Prob > chi2  =      0.1623
```

Source: Stata v15 Outputs

The result of Residuals Heteroskedasticity Test in the previous table indicated that prob = 0.1623, which is greater than 5%, Accordingly there is no problem residuals Heteroskedasticity, which mean accepted the null hypothesis There's no Heteroskedasticity in the residuals, and reject Alternative hypothesis

### • The model results

To determine the best model between a pooled regression model or (fixed effects model and a random effect model) We're going to use Lagrangian test.

### •Lagrangian Multiplier Test

Figure 15: Results of a Lagrangian Multiplier Test

```
. xttest0

Breusch and Pagan Lagrangian multiplier test for random effects

FSI[Cid,t] = Xb + u[Cid] + e[Cid,t]

Estimated results:

```

	Var	sd = sqrt(Var)
FSI	.1539474	.3923613
e	.0752334	.2742871
u	.0866238	.2943193

```

Test:  Var(u) = 0
           chibar2(01) =    25.11
           Prob > chibar2 =    0.0000

```

Source: Stata v15 Outputs

The test results show that prob Lagrangian Multiplier is = 0.000, which is less than 0.05.

- null hypothesis: FEM or REM regression models will be better than PRM.

- alternative hypothesis PRM regression will be better than both FEM and REM.

from the results, we accepted the null hypothesis and reject the alternative hypothesis ,therefore, the best model is FEM or REM.

#### •Hausman test

Hausman test was used for choosing between the fixed effects model (FEM) and random effects model (REM), the following table shows test results:

Figure 16: Hausman test Result

```
. hausman fe re
```

	Coefficients			
	(b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
CRM	-.0065826	.0026818	-.0092644	.0166711
ROI	-.0038398	-.0334329	.0295931	.0987445

b = consistent under Ho and Ha; obtained from xtreg  
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(2) = (b-B)' [(V\_b-V\_B)^(-1)] (b-B)  
 = 0.58  
 Prob>chi2 = 0.7490

Source: Stata v15 Outputs

The results of the previous table show that the significant value of the Hausman test is = 0.7490, which is greater than 5%,

- null hypothesis: no correlation between the fixed effects of companies.
- alternative hypothesis: there is a correlation between the fixed effects of companies.

from the results, we accepted the null hypothesis and reject the alternative hypothesis, therefore, the best model is REM.

#### • Random effects model (REM)

Table 6: Results of Random effects model (REM)

FSI	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
CRM	-.450	-.135	7.08	.000	.065	.071	
ROI	-.203	.298	6.34	.004	.225	.158	
Constant	-.209	-.191	2.29	.002	.03	.388	0.00
Mean dependent var		0.188	SD dependent var			0.392	
Overall r-squared		0.306	Number of obs			96	
Chi-square		4.129	Prob > chi2			0.008	
R-squared within		0.100	R-squared between			0.421	

\*\*\*  $p < .01$ , \*\*  $p < .05$ , \*  $p < .1$

Source: Stata v15 Outputs

The previous table shows the results of the multiple regression test of independent study variables (CRM – ROI) and dependent

variables financial statement irregularities, and notes from the following results:

- There is a strong inverse relationship between the independent variables (CRM – ROI), and the dependent variable (financial statement irregularities), which can be represented by the simple linear regression model of the following:

$$FSI = - 0.209 - 0.450 CRM - 0.203 ROI$$

**Which means if the CRM increases by 100% and the financial statement irregularities level will decrease by 45%. And When ROI increases by 100% and the financial statement irregularities level will decrease by 20%**

- Significance of independent variables is (0.000) lower than (0.05), which means the variable is statistically significant.
- The degree of the significance regression model proposed (0.00) is less than (0.05), which means that the model is statistically significant.
- Reached the coefficient of determination is  $R^2=30\%$ , which means, 30% from changes in profit per share because of the change in CRM and ROI.

Finally, the results and previous analysis confirm that there is a significant impact between risk assessment on financial statement irregularities of the firm.

**The Main H1 Hypothesis: risk assessment positively affects the financial performance of the firm.**

Table 7: correlation between variables

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) CRM	1.000					
(2) ROI	0.218	1.000				
(3) leverage	0.537	0.657	1.000			
(4) Roa	0.889	0.347	0.051	1.000		
(5) Ppshare	0.609	0.564	0.328	0.179	1.000	
(6) FSI	0.558	0.668	0.073	0.162	0.123	1.000

The previous table shows the results of the correlation test between independent variables (CRM–ROI) and dependent variables (Leverage–roa–ppshare–FSI), and the following are the most important results:

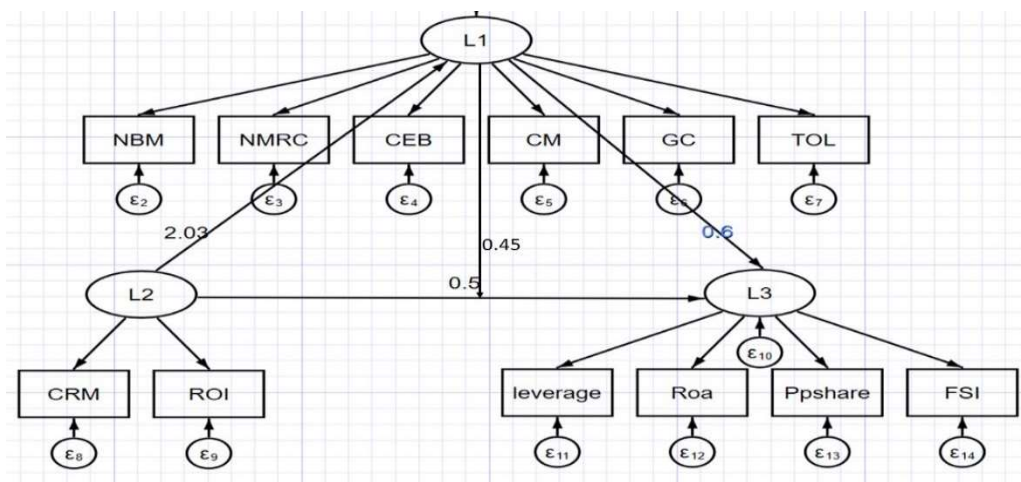
- There is a strong relationship between CRM and the dependent variable (Roa –ppshare), the correlation values are (0.889 – 0.609), and Moderate relationship between CRM and Leverage Because the R= 0.537
- There is a Moderate relationship between ROI and the dependent variable (leverage – Roa –ppshare–F), the correlation values are (0.657 – 0.347 – 0.564)
- There is Moderate inverse relationship between (ROI–CRM) and the dependent variable (FSI), Because the correlation values are (–0.558 / –0.668)

Finally, the results and previous analysis confirm that there is a significant impact between risk assessment on the financial performance of the firm.

## H2: The control environment moderates the relationship between risk assessment and financial performance.

To test the hypotheses, the recursive Causal Models path analysis method was used on STATA to illustrate the direct and indirect effects of the study variables as shown by the following presentation:

Figure 17: Path analysis



Source: Stata v15 Outputs

From the previous figure, the independent variables (risk assessment) effects on moderated variable (control environment) by factor 2, and effects on financial performance variable by a factor of 0.54

The moderated variable (control environment) affects the financial performance variable by a factor of 0.6, and the path coefficient is defined as the ratio of change in the affected (dependent) variable relative to the change in the variable influencer (independent)

Previous results indicate that moderated variable (control environment) influences the relationship between the risk assessment variable and the financial performance variable and the relationship between them is positive, indicating that the estimated regression models are significant.

#### Conclusion:

The research is done to determine the impact of risk assessment on the financial performance of firms in Egypt. Using a sample of firms' years from 2018 to 2020, we find that there was a significant positive relationship between risk assessment and financial performance of the firms in Egypt. Additionally, risk assessment affects positively the leverage, return on assets, and profit per share, and negatively affects the financial statement irregularities. Furthermore, the study findings revealed that the control environment has a positive impact on the relationship between risk assessment and financial performance.

Our results contribute to the literature review by providing a more complete understanding of the relationship between risk assessment and financial performance, besides, the impact of the control environment on this relationship.



The study findings are expected to guide the top management in the organization in improving financial performance as well as taking actions to strengthen the internal control over financial reporting, in particular, risk assessment, control environment, and information and communication.

#### Recommendations:

The study recommended that, because of the positive impact of risk assessment on financial performance, it is necessary, for organizations, to have a risk management department. In addition, it is important to strongly encourage and incentivize ethical principles and enhance integrity and competence, besides, training and spreading awareness about the internal control system, in particular, risk assessment. Moreover, an auditor's report on the quality of internal controls, especially over financial reporting, needs to be obligatory by Egyptian auditing standards or by laws. Generally, it is important for management to pay more attention to risk assessment activities because of its key role in improving the business's financial health over time besides, it is a vital tool to resist emergencies in the future.

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