THE IMPACT OF ENTERPRISE RISK MANAGEMENT DISCLOSURE AND FIRM VALUE IN EGYPTIAN PUBLIC AND PRIVATE SECTORS: A COMPARATIVE STUDY

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Abstract: The main objective of this research is to investigate the relationship between enterprise risk management (ERM), risk disclosure and firm value. The research aims to compare the public and private sectors in Egypt. The sample consists of 30 non-financial public companies and 30 non-financial private companies within the period 2011 to 2021. The results indicated an insignificant positive relationship between ERM and firm value for both the public and private sectors. The results found a significant positive relationship for the private sector and a significant positive relationship between ERM and risk disclosure for the public sector sample. The results show preferable values for private than public for the variables; ERM and risk disclosure score. That means that the private sector companies give more consideration to the ERM and risk disclosure than the public sector.

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Introduction

The current business changes has been associated with different types of risks in all levels of the organization which is known as systematic risk. Technology and digitalization have created different types of risks at higher levels. "Risk" should not always be treated as a potential loss, but it may be an opportunity to seize. The concept of risk has evolved according to the risk management (RM) framework to incorporate both positive and negative outcomes of events.

Amran, Rosli Bin, & Hassan (2009, p.40) refers defined RM to "the methods and processes used by organizations to manage risks (or seize opportunities) related to the achievement of their objectives". In September 2004 Committee of Sponsoring Organizations of the Treadway Commission (COSO) issued its framework for enterprise-wide risk management, Enterprise Risk Management—Integrated Framework. The movement towards COSO Enterprise Risk Management (ERM) (2004) has shifted the focus to a more holistic appreciation of risk.

Quon, Zeghal, & Maingot (2012) explored that the major objective of ERM is to increase shareholder value. Most decisions involve a trade-off between some kind of risk and its associated benefit (reward). The practice of ERM varies from company to company where there is no ideal ERM system due to different risks and risk standpoint each company faces (Schneier, & Miccolis, 1998; COSO, 2004). The Lack of mandatory agreed upon standards that identify risk, risk measurements, and risk management forced COSO (2004) had suggested a contingency perspective toward the appropriate ERM system for a particular organization.

Many countries had already obliged RM disclosure but it is still voluntary in other countries (Hassan et al., 2011). Risk disclosures is defined by Linsley, & Shrives (2006) as "informing the reader of any opportunity or prospect, or of any hazard, danger, harm, threat or exposure, that has already impacted upon the company or may impact upon the company in the future or of the management of any such

opportunity, prospect, hazard, harm, threat or exposure". Overall the world, companies are required to report within their mandatory regulations. A great doubt regarding whether these mandatory regulations are enough to make a company disclose all relevant information to satisfy stakeholders or not (Mohobbot & Noriyuki, 2005). Hassan et al. (2011) declared that the level of information available to one particular investor could be different from that available to another investor due to information asymmetry between outside investors and managers.

It is important for the professional boards of the accounting standards to solve the risk measurement problems within a reasonable cost and to assess the risk disclosure completeness and accuracy. There is no best measure for risks which can be identified as standard for a company. Different companies use different measures even in the same industry. It is important for standard setters to establish a standardized risk measurement for better risk disclosure.

According to Beretta & Bolozzan (2004); the richness of disclosure communication and the quality of information could also affect the way the investors perceive the information. Most of the transparency research focused on disclosure in terms of the quantity of the disclosure information while neglecting the quality aspect. It is known that a company with more number of pages in their annual report does not necessarily present clear and valuable information. This study takes into account the quantity of information provided due to the difficulty of measuring the quality of information disclosed. Both Abraham & Cox (2007) and Cabedo & Tirado (2004) studies reported that the information on risks through financial reporting is insufficient and lacks completeness and adequacy required for decision-making purposes, the matter that additional information on risks is required.

Prior studies on the financial reporting practices of Egyptian listed companies have shown that there is a weak compliance with disclosure requirements (Ismail & Abdelmoneim, 2013; Abd-Elsalam & Weetman, 2003; Dahawy, Merino & Conover, 2002; Hassan, Giorgioni, & Romilly, 2006; Dahawy & Conover, 2007; Hassan et al., 2009; PCSU, 2000; and ROSC, 2002). The purpose of this research is to investigate

the relationship between ERM, Risk disclosure and firm value for non-financial companies listed on the Egyptian Stock Exchange market (EGX). The third is to study the relationship between risk disclosure and ERM.

Literature Review

The following review of literature aims to shed light on relevant prior studies that has dug into the organizational motives behind RM implementation and its value creation. From the studies which proved that RM does add value to the firm is Miller & Modigiani (1961) who argued that EM is irrelevant under their assumptions of the capital market. According to the M&M theorem, the value of the firm is not affected by any risk management decisions undertaken by the company (Miller & Modigliani, 1961). Moving forward, According to financial theory, corporate hedging can increase shareholder value in the presence of capital market imperfections such as direct and indirect costs of financial distress, costly external financing, and taxes (Aretz & Bartram, 2010).

On contrary, a great contribution in the risk management value area was done by Stulz (1984) which systematically used the modern finance theory frame to analyze the value creation of risk management. Many other researchers have hypothesized the invalidity of the M&M theorem and state that risk management does add value to the firm (Myers, 1977; Froot, Scharfstein, & Stein, 1993; Allayannis & Weston, 2001; Carter, Rogers, & Simkins, 2005; Wang, Li, & Zou., 2010; Hoyt & Liebenberg, 2011; and Ghosh, 2013). While other studies did not find any supportive evidence for the relationship between the ERM implementation and increasing the value of the firm (Lookman, 2004; Jin & Jorian, 2006; and Pagach & Warr, 2008).

Both Abdullah et al. (2015) and Abdel-Azim & Abdelmoniem (2015) found that Risk management disclosure increases firm value. Therefore, the question of whether ERM can enhance the firm value is still in dispute at present and it is necessary to conduct a deep research (Wang, Li, & Zou, 2010). Accordingly the first hypothesis is evolved:

H_1: There is a positive association between ERM and firm value

The relation between risk i.e. market beta and risk disclosure is crucial to clarify; risk disclosure ranges from mandatory to voluntary and literature had examined both. Lam & Du (2004) found preliminary evidence that companies which complied more fully with mandatory disclosure requirements tended to have a lower market beta. On contrary, Linsley & Shrives (2006) did not find any relationship between the number of risk disclosures and beta factor.

Hausin, Hemmingsson, & Johansson (2008) declared that higher level of voluntary disclosure reduces the information gap (asymmetry) between companies and investors. Hassan et al. (2011) and Abdel-Azim & Abdelmoniem (2015) examined the relation between corporate voluntary disclosure and systematic (market/beta) risk in a sample of Egyptian listed companies. They indicated that there is a negative relationship exists between voluntary disclosure and the market risk exposure. According to Solomon et al. (2000), it seems that a voluntary framework is preferred for risk disclosure despite the weaker influence shareholders may have within a voluntary environment unless they have substantial investment in their investee companies.

From the previously mentioned studies, the second hypothesis is evolved:
H2: There is a negative association between high risk disclosure and risk.

Following the same line of literature investigating the relation between risk and risk disclosure; it is fruitful to examine the relation between risk disclosure and ERM. It is expected that increasing the risk disclosure would increase the capability of managers to manage and reduce those risk effectively. From the studies that examined the impact of ERM on Risk disclosure is Diez & Gutierrez (2009) who declared that with market imperfections, risk management creates value to the firm. In the other hand, Buckby, Gallery, & Ma (2015) did not find evidence that company risk measures are significantly associated with greater levels of RM disclosure.

Ismail & Abdul Rahman (2013) examined the risk management disclosure level in listed Malaysian companies and they found that risk

management disclosure is relatively low irrespective of the importance of that information.

From the studies that depicted the risk disclosure items that affect ERM most is Rosnadzirah, Abdul Rahman, & Normah (2013)'s which developed a risk management scorecard to examine the sharia compliance risk disclosure and indicated that the highest attribute disclosed item was control activities, while the lowest was for sharia compliance risk. Hoang & Ruckes (2014) found that if risk management is observable, even risk-neutral companies typically have strong incentives to engage in risk management activities in order to reduce the likelihood of entry.

From the previously mentioned studies, the third hypothesis is evolved:

H_3: There is a positive association between high risk disclosure and ERM.

Few studies tested if risk disclosure creates value in the firm. Muller & Verschoor (2008) supported the assumption that European companies use The Foreign Currency Derivatives (**FCDs**) could protect themselves against currency fluctuations. However, derivatives disclosures are shown to have statistically weak effects. Rahmat & Hoffman (2011) found an indication for a positive impact of good hedging disclosure on the hedging premium, and they found that additional disclosure did not create a higher premium on firm's value than IFRS. Almaz, Benjeddi, & Luit (2010) as well concluded that the publications of a company's risk management are negatively correlated with the firm value.Thus, the fourth hypothesis is evolved:

H_4: There is a positive association between high-risk disclosure and firm value.

Methodology:

In order to achieve the objectives of the research, the research sample consists of 60 non-financial companies; 30 from public companies and 30 from private companies within the period from 2011 through 2021. The ERM is calculated by a percentage from a checklist that is completed by content analysis from annual reports for years. Firm value is calculated by Tobin's Q. Data concerning disclosure is derived from the companies' annual reports for years 2011 to 2021. Risk is calculated by Beta derived from Capital Pricing Model (CAPM) model, Beta is calculated from the daily stock price for each company within the period from 2011 through 2021.

The first hypothesis is tested by the following model:

Log Tobin's Q = αo + B1 ERMI + B2 ASSET + B3 LAR + B4 CR + B5 ROA +e .(1)

Where,Tobin's Q represents firm value and is calculated as follows:

Total book value of Assets – book value of Equity + market value of Equity
Total book value of assets

ERMI is ERM *Index which is a* score (percentage) calculated from a 22 items-checklist (See Appendix A).

Control variables include; the total assets (ASSET), Liabilities-assets ratio (LAR), Current ratio (CR), and the Profitability (ROA).

Table 1. Definitions and Measures of Variables in Model 1

Variable		Definition
Firm Value	Log Tobin's Q	Log Tobin's Q
Enterprise risk management index	ERMI	Score (percentage) calculated from a 22 checklist for each company for each year from 2011 to 2021
Size of company	SIZE	Log (total assets)
Liabilities-assets ratio	LAR	Total liability/total assets
Current ratio	CR	Current assets/current liabilities
Profitability	ROA	Net profit/total assets

The second hypothesis is tested by the following model:

Betai,t = αo + B1 RISK_DISCLOSURE + B2 DIVIDPAY + B3ASSETGR

+ B4 GEAR + B5 SIZE + B6 BTMR +e ……..(2)

Where, the Risk disclosure (RISK_DISCLOSURE) is calculated as a percentage of disclosed items for each category of risk in Arthur Andersen business risk model. The checklist is filled through analyzing the annual reports, in addition interim financial statements, general assemblies (**GAs**), and websites through content analysis to classify whether the information in the annual report is about risk or not. This checklist takes into account both mandatory and voluntary risks. This research focuses only on the non-financial section or the narrative part of the annual report.

Beta$_{i,t}$ - systematic market risk is calculated from the CAPM model. The EGX 30 will be used in measuring the change in market index.

R$_i$ = α$_i$ + B$_i$ Rm$_{i,t}$ + e

Control variables include; the payout (DIVIDPAY), asset growth (ASSETGR), gearing (GEAR), size (SIZE), and the book value of equity divided by market value of equity (BTMR).

Table 2. Definition and Measures of Variable in Model 2

Variable		Definition
Beta	Beta	Calculated from the CAPM model
Risk Disclosure	RISK_DISCLOS URE	a percentage of disclosed items for each category of risk for each company for years 2011 to 2021
Dividend Payout	DIVIDPAY	Dummy Variable; 1 means "Pay"; 0 means "no pay"
Asset growth	ASSETGR	The fixed assets at the financial year-end divided by total sales at the financial year-end
Leverage	LEV	The average of Total debt divided by the total of equity at year-end
Firm size	SIZE	Log (total assets)
BTMR	BTMR	The book value of equity at the financial year-end divided by market value of equity at the financial year-end

The third hypothesis is tested by the following model:

$$ERMI = \alpha_1 + B_1\,RISK\_DISCLOSURE + B_2\,SIZE + B_3\,CR + B_4\,LAR + B_5\,ROA + e....(3)$$

Where, Control variables include; the size (SIZE), Current ratio (CR), Liabilities-Asset ratio (LAR), and the Profitability (ROA).

Table 3. Definition and Measures of Variables Model 3

Variable		Definition
Enterprise risk management index	ERMI	Score (percentage) calculated from a 22 checklist for each company for each year from 2011 to 2021
Risk Disclosure	RISK_DISC LOSURE	a percentage of disclosed items for each category of risk for each company for years 2011 to 2021
Size of firm	SIZE	Log (total assets)
Current ratio	CR	Current assets/current liabilities
Liabilities-Assets ratio	LAR	Total liability/total assets
Profitability	ROA	Net profit/total assets

The fourth hypothesis is tested by the following model:

Log Tobin's Q = α_1 + B$_1$ SIZE + B$_2$ LEV + B$_3$ ROA + B$_4$ ACCESS + B$_5$ RISK_DISCLOSURE +e ....(4)

Where,

Control variables include; size (SIZE), leverage (LEV), profitability (PROF), access to financial markets (ACCESS).

Table 4. Definition and Measures of Variables for Model 4

Variable		Definition
Firm Value	Log Tobin's Q	Log Tobin's Q
Risk Disclosure	RISK_DISCL OSURE	a percentage of disclosed items for each category of risk for each company for years 2004 to 2014
Leverage	LEV	The average of Total debt divided by the total of equity at year-end
Firm size	SIZE	Log (total assets)
Access Foreign markets	ACCESS	Dummy variable; 1 means "the company has foreign market access"; 0 means "the company has no access"
Profitability	ROA	Net profit/total assets

Results:

Based on the regression model (1), the influence on the value of firms in non-financial industry is tested for the public sector companies. As indicated in Table 5, Model(1) with Tobin's Q as the dependent variable, and the "ERMI" as indicator for enterprise risk management as an independent variable; there is an insignificant positive relationship between the ERM and firm value, so the first hypothesis is rejected:

H1: There is a positive association between ERM and firm value

There are other relationships indicated among the firm value and the firm characteristics. The model did not verify the expected results regarding the Size i.e. log total asset. The model indicated an insignificant negative relation between firm value and the size of the firm.

In the other hand, the model did verify the relationship between LAR and ROA with the firm value, as it indicated that there is significant positive relationship between LAR and ROA with the firm value. The model weakly supported the relationship between current ratio and the firm value indicating that there is an insignificant positive relationship between them.

Table 5. Results from Testing the First Relationship Using Model (1) for Public Companies

Independent Variables	Expected sign	Sign from the model	p-value
Constant			0.001***
ERMI	+ve	+ve	0.538
SIZE	+ve	-ve	0.188
Liabilities-Assets ratio (LAR)	+ve	+ve	0.028*
Current ratio (CR)	+ve	+ve	0.418
Profitability (ROA)	+ve	+ve	0.000***

***Parameter is significant at the (.001) level.
**Parameter is significant at the (.01) level.
*Parameter is significant at the (.05) level.

Based on the regression model (1), the influence on the value of firms in non-financial industry is tested for the private sector companies. As indicated in Table 6, Model(1) with Tobin's Q as the dependent variable, and the "ERMI" as an independent variable as an indicator for ERM as an independent variable; there is an insignificant positive relationship between the ERM and firm value, so the first hypothesis is rejected:

H1: There is a positive association between ERM and firm value

There are other relationships indicated between the firm value and the firm characteristics. The model provided weak evidence for the relationship between Size and the firm value, as it indicated that there is insignificant positive relationship between them.

The model did verify as well the relationship between LAR, CR and ROA with the firm value. The model indicates that there is a significant positive relationship between them.

Table 6. Results from Testing the First Relationship Using Model (1) for Private Companies

No.	Independent Variables	Expected sign	Sign from the model	p-value
1	**Constant**			0.896
2	**ERMI**	**+ve**	**+ve**	0.081
3	**SIZE**	**+ve**	**+ve**	0.231
4	**Liabilities-assets ratio (LAR)**	**+ve**	**+ve**	0.017*
5	**Current ratio (CR)**	**+ve**	**+ve**	0.004*
6	**Profitability (ROA)**	**+ve**	**+ve**	0.000***

***Parameter is significant at the (.001) level.
**Parameter is significant at the (.01) level.
*Parameter is significant at the (.05) level.

Based on the regression model (2), the relationship between risk and risk disclosure is tested. As indicated in table 7, Model (2) with Beta as the dependent variable, and the "Risk disclosure" as indicator for Risk disclosure calculated a percentage of disclosed items for each category of risk for each firm for years 2004 to 2014 as an independent variable; there is *an insignificant* positive relationship between the market risk (beta) and risk disclosure, so the second hypothesis H_2 **is rejected:**

H_2: *There is a negative association between increased risk disclosure and risk*

This means that by increasing the risk disclosure, the firm market risk exposure increases.

There are other relationships analyzed among the market risk and the firm characteristics. The model did not verify the expected results regarding the dividend pay with the market risk.

In the other hand, the model did verify the relationship between asset growth and the book value/market value of Equity from one side, and market risk exposure, as it indicated that there is a significant negative relationship between increasing the asset growth and book value/market value of Equity and the firm risk exposure. The model did verify the relationship between firm size and the leverage from the other side with the exposure risk, indicating that there is an insignificant positive relationship between them.

Table 7. Results from Testing The Second Relationship Using Model (2) for Public Companies

No	Independent Variables	Expected sign	Sign from the model	p-value
1	Constant			0.309
2	Risk disclosure	-ve	+ve	0.351
3	Dividend pay	-ve	+ve	0.274
4	Asset GR	-ve	-ve	0.007**
5	Leverage	+ve	+ve	0.335
6	Firm size	+ve	+ve	0.520
7	BTMR	-ve	-ve	0.001***

***Parameter is significant at the (.001) level.
**Parameter is significant at the (.01) level.
*Parameter is significant at the (.05) level.

Based on the regression model (2), the relationship between risk and risk disclosure is tested. As indicated in table 8, Model (2) with Beta as the dependent variable, and the "Risk disclosure" as indicator for Risk disclosure calculated a percentage of disclosed items for each category of risk for each firm for years 2004 to 2014 as an independent variable; there is *a significant* positive relationship between the market risk (beta) and risk disclosure, so the second hypothesis H_2 **is rejected:**

H_2: There is a negative association between increased risk disclosure and risk

This means that by increasing the risk disclosure in private sector companies, the firm market risk exposure increases.

There are other relationships analyzed between the market risk and the firm characteristics. The model did not verify the expected results regarding the book value/market value of Equity with the market risk.

In the other hand, the model verified other relationships but with weak evidence. The relationship between dividend pay, asset growth, from one side, and market risk exposure from the other side, indicated that there is an insignificant negative relationship between them. The model did verify the relationship between leverage and firm size with the exposure risk, indicating that there is an insignificant positive relationship between them.

Table 8. Results from Testing the Second Relationship Using Model (2) for Private Companies

No.	Independent Variables	Expected sign	Sign from the model	p-value
1	Constant			0.741
2	Risk disclosure	-ve	+ve	0.000***
3	Dividend pay	-ve	-ve	0.382
4	Asset GR	-ve	-ve	0.485
5	Leverage	+ve	+ve	0.502
6	Firm size	+ve	+ve	0.139
7	BTMR	-ve	+ve	0.067

***Parameter is significant at the (.001) level.
**Parameter is significant at the (.01) level.
*Parameter is significant at the (.05) level.

Based on the regression model (3), the relationship between ERM and risk disclosure is tested for public sector companies. As indicated in Table 9, Model (3) with ERM as the dependent variable, and the "Risk disclosure" as indicator for Risk disclosure calculated a percentage of disclosed items for each category of risk for each firm for years 2011 to 2021 as an independent variable; there is *a significant* positive relationship between ERM and risk disclosure, so the third hypothesis H_3 is **verified:**

H_3: There is a positive association between risk management and increased risk disclosure

This means that by increasing the risk disclosure in public sector companies, the ERM increases.

There are other relationships analyzed among the ERM and the firm characteristics. The model did not verify the expected results regarding the LAR and CR with the ERM indicating that there is an insignificant negative relationship between them.

The model did not verify the relationship between firm size and ROA with the ERM from the other side, indicating that there is a significant negative relationship between them.

Table 9. Results From Testing The Second Relationship Using Model (3) for Public Companies

No.	Independent Variables	Expected sign	Sign from the model	p-value
1	Constant			0.008**
2	Risk disclosure	+ve	+ve	0.00***
3	Firm size	+ve	-ve	0.043*
4	Current ratio (CR)	+ve	-ve	0.104
5	Liabilities-assets ratio (LAR)	+ve	-ve	0.301
6	Profitability (ROA)	+ve	-ve	0.004**

***Parameter is significant at the (.001) level.
**Parameter is significant at the (.01) level.
*Parameter is significant at the (.05) level.

Based on the regression model (3), the relationship between ERM and risk disclosure is tested for private sector companies. As indicated in Table 10, Model (3) with ERM as the dependent variable, and the "Risk disclosure" as indicator for Risk disclosure calculated a percentage of disclosed items for each category of risk for each firm for years 2011 to 2021 as an independent variable; there is a positive *insignificant* relationship between ERM and risk disclosure, so the third hypothesis H_3 is **rejected:**

H_3: *There is a positive association between risk management and increased risk disclosure*

There are other relationships analyzed between the ERM and the firm characteristics. The model did not verify the expected results

regarding the LAR, firm size, and CR with the ERM, indicating an insignificant negative relation between them. The model did not verify the relationship between ROA and the ERM from the other side, indicating that there is a significant negative relationship between them.

Table 10. Results from Testing The Relationship for Model (3) for Private Companies

No.	Independent Variables	Expected sign	Sign from the model	p-value
1	Constant			0.000***
2	Risk disclosure	+ve	+ve	0.795
3	Firm size	+ve	-ve	0.530
4	Liabilities-assets ratio (LAR)	+ve	-ve	0.666
5	Current ratio (CR)	+ve	-ve	0.173
6	Profitability (ROA)	+ve	-ve	0.000***

***Parameter is significant at the (.001) level.
**Parameter is significant at the (.01) level.
*Parameter is significant at the (.05) level.

Based on the regression model (4), the relationship between firm value and risk disclosure is tested for public sector companies. As indicated in Table (11), Model(4) with Tobin's Q as the dependent variable, and the "risk disclosure" calculated a percentage of disclosed items for each category of risk for each firm for years 2011 to 2021 as an independent variable; there is *an insignificant* negative relationship between the risk disclosure and firm value, so the fourth hypothesis is **rejected**:

H₄: There is a positive association between increased disclosure and firm value

There are other relationships found between Firm value and the firm characteristics. The model did verify the relationship between leverage and profitability from one side and the firm value from the other side, indicating that there is a significant positive relationship between them.

The model did not verify the relationship between firm size and firm value indicating that there is an insignificant negative relationship

110

between them. The model did not as well verify the expected results regarding the foreign market access and the firm value indicating that there is an insignificant negative relationship between them.

Table 11. Results from Testing the Fourth Relationship Using Model (4) for Public Companies

No.	Independent Variables	Expected sign	Sign from the model	p-value
1	**Constant**			**0.004****
2	**Risk disclosure**	**+ve**	**-ve**	**0.292**
3	**Leverage**	**+ve**	**+ve**	**0.05***
4	**Firm size**	**+ve**	**-ve**	**0.560**
5	**ACCESS**	**+ve**	**-ve**	**0.195**
6	**Profitability (ROA)**	**+ve**	**+ve**	**0.000****

***Parameter is significant at the (.001) level.
**Parameter is significant at the (.01) level.
*Parameter is significant at the (.05) level.

Based on the regression model mentioned previously, the relationship between firm value and risk disclosure is tested for private sector companies. As indicated in Table 12, Model(4) with Tobin's Q as the dependent variable, and the "risk disclosure" calculated a percentage of disclosed items for each category of risk for each firm for years 2011 to 2021 as an independent variable; there is an insignificant negative relationship between the risk disclosure and firm value, so the fourth hypothesis is rejected:

H4: There is a positive association between increased disclosure and firm value

There are other relationships indicated between Firm value and the firm characteristics. The model did verify the relationship between profitability and Firm value indicating a significant positive relationship between them. The model could not verify the relationship between leverage and the firm value indicating that there is an insignificant positive relationship between them.

The model indicated that there is an insignificant negative relationship between these firm characteristics and firm value.

Table 12. Results from Testing the Fourth Relationship Using Model (4) for Private Companies

No.	Independent Variables	Expected sign	Sign from the model	p-value
1	Constant			0.001***
2	Risk disclosure	+ve	-ve	0.574
3	Leverage	+ve	+ve	0.168
4	Firm size	+ve	-ve	0.950
5	ACCESS	+ve	-ve	0.438
6	Profitability (ROA)	+ve	+ve	0.000***

***Parameter is significant at the (.001) level.
**Parameter is significant at the (.01) level.
*Parameter is significant at the (.05) level.

The researchers used a T-Test analysis to differentiate between public and private sample companies:

- There are significant differences between public and private companies in relation to the variables under study; firm value, enterprise risk management score, size, asset liabilities ratio, current ratio, return on asset, risk, risk disclosure score, asset growth, and leverage.

- The mean shows preferable values for private than public for the variables; firm value, enterprise risk management score, size, current ratio, risk, risk disclosure score, and BTMR. That means that the private sector companies give more consideration for the ERM and the risk disclosure than the public sector. This result was expected by the researcher.

- The mean shows preferable values for public than private for the variables; asset liabilities ratio, return on asset, asset growth, and leverage. This may be due to the 2011 Egyptian revolution bad effects on the private sector because the sample years extend from 2011 to 2021. The public sector in the other side provides strategic products such as sugar, medicines, and wheat. Besides that the public sector is supported from the government while the private is not.

Conclusion:

The research has approved the third relationship for public sector only. The results evidenced a significant positive relationship between ERM and risk disclosure for public sample, however for the private sample this relation was insignificant. The results for public sector regarding the third hypothesis **H_3** are positively correlated with Diez & Gutierrez (2009), and Hoang & Ruckes (2014) and they are contradicted with Buckby, Gallery, & Ma (2015).

In the other side, the research could not approve the first and fourth relationships due to weak results found. The results indicated an insignificant positive relationship between ERM and firm value for both public and private sample. The results found an insignificant negative relationship between risk disclosure and firm value for both sectors. Regarding the second relation; the results found an insignificant positive relationship between risk disclosure and the market risk exposure for public sample and a significant positive relationship for the private sample.

The results regarding the first hypothesis H1 are negatively correlated with Allayannis & Weston (2001) , Carter, Rogers, & Simkins (2005), Nain (2004) ,Wang, Li, & Zou (2010), Hoyt &Liebenberg (2011) and Ghosh (2013) who found a positive relation between firm value and the use of ERM. Ballantyne (2013) provided little evidence that ERM maturity is associated with firm value. However, these results agree with Miller & Modigiani (1961), Lookman (2004), Jin & Jorian (2006), Chen &Wang (2006), and Pagach & Warr (2008).

The results regarding the second hypothesis H2 are contradicted with Coles, Loewenstein, & Suay (1995), Leuz & Wysocki (2008), Lam & Du (2004), and Hassan et al. (2011). Those studies declared a negative association between the amount of information available about a security and its estimated market beta. The researchers think that the differences between this paper results and those previous studies results are that those studies took insight into the security disclosure per se, in addition both Hassan et al. (2011) and Solomon et al. (2000)'s studies took into account the voluntary risk disclosure only, while Lam & Du

(2004) took into account the mandatory risk disclosure. This research covers both voluntary and mandatory risk disclosure.

The results regarding the fourth hypothesis H4 are positively correlated with Muller & Verschoor (2008), Almaz, Benjeddi, & Luit (2010). However, these results are contradicted with Rahmat & Hoffman (2011), Abdullah et al. (2015) Abdel-Azim & Abdelmoniem (2015). The researchers believe that the differences between this research results and Both Abdullah et al. (2015) and Abdel-Azim & Abdelmoniem (2015) are due to that both studies took into account the voluntary risk management disclosure, as well Abdullah et al. (2015) classified the voluntary risk management disclosure into DVRMD and BVRMD that might affected their results. While in Abdel-Azim & Abdelmoniem (2015)'s, the sample was limited to only 6 non-financial companies for four-years-period of time from 2006 to 2009. The size of their sample is not representative to be a generalization regarding their results.

The researchers differentiate between the public and private sample companies regarding the variables of each model of the four models under study. The results show preferable values for private than public for the variables; ERM and risk disclosure score. That means that the private sector companies give more consideration for the ERM and the risk disclosure than the public sector. This result was expected by the researchers.

The generalization of this research's results is limited to non-financial companies listed in the EGX due to the special nature of financial companies in relation to their financial structure and disclosure. Regarding risk disclosure, the research is limited to subjective content analysis. This research takes into account the quantity of information (i.e. word counting within risk sentences), while the quality is not considered due to the difficulty of measuring the quality of information disclosed. Regarding ERM measurement, in this research the researchers used Monda & Giorgino (2013)'s ERM checklist to record the ERM score percentage. The researchers could not follow Gordon, Loeb, & Tseng (2009) ERMI model which is considered a reasonable measure for ERM due to lack of data; hence some variables of the model are not published in the EGX.

According to the research results, the researchers recommend the accounting standard boards to mandate ERM disclosure and to ensure more risk disclosure to the public in Egypt due to the low compliance of ERM and low risk disclosure in EGX listed companies in both public and private sectors in both ERMI checklist scores and risk disclosure checklist scores respectively. It is an urgent request to enhance the awareness of ERM compliance in the Egyptian companies and connecting it to the public trust and the financial performance. It is important for the accounting standards boards to solve the risk measurement problems within a reasonable cost and to assess the risk disclosure completeness and accuracy. The researchers recommend companies to voluntarily disclose more information about non-Financial Risk Management (FRM) since it could increase their firm value.

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Appendix A:

The ERMI Checklist Score Results for the 30 Public Companies for Each Year from 2011 to 2021 for 1st Model*:

Years	Score	Total score										
		2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
1. Does the organization have an ERM program (process) in place?		16.5	17.5	16	16	14	12	12	12	8	6	6
Yes	1	16	17	16	16	14	10	10	12	8	6	6
Not yet, but implementing it	0.5	1	1	0	0	0	2	2	0	0	0	0
No	0	13	12	14	14	16	18	18	18	22	24	24
2. Has a RM/ CRO been designated in charge for enterprise-wide risk management?		0	0	0	0	0	0	0	0	0	0	0
Yes	1	0	0	0	0	0	0	0	0	0	0	0
No	0	30	30	30	30	30	30	30	30	30	30	30
3. Has an ERM policy been defined?		7	7.5	7	7	7	6	6	6	4	3	3
Yes	1	1	1	1	1	1	1	1	1	0	0	0
Not yet, but defining it	0.5	12	13	12	12	12	10	10	10	8	6	6
No	0	0	0	0	0	0	0	0	0	22	24	24
4. Is the ERM integrated with strategic and business plans?		14.5	15.5	14	14	13	11	11	11	8	6	6
Yes	1	14	15	14	14	13	11	11	11	8	6	6
In part	0.5	1	1	0	0	0	0	0	0	0	0	0
No	0	15	14	16	14	17	19	19	19	22	24	24
5. Who is the prime sponsor of ERM in the organization?		2	2	2	2	1	1	1	1	1	1	1
BOD	1	2	2	2	2	1	1	1	1	1	1	1
CFO	1	0	0	0	0	0	0	0	0	0	0	0
CEO	1	0	0	0	0	0	0	0	0	0	0	0
Internal Auditor	1	0	0	0	0	0	0	0	0	0	0	0
Not mentioned	0	28	28	28	28	29	29	29	29	29	29	29
6. Does a dedicated ERM function exist in the organization?		2	2	2	2	1	1	1	1	0	0	0
Yes	1	2	2	2	2	1	1	1	1	0	0	0
No	0	28	28	28	28	29	29	29	29	30	30	30

	Weight											
7. Is it clearly specified who is accountable for every identified risk as well as who is responsible for controls to treat the risk?		0.5	0.5	0.5	0.5	0	0	0	0	0	0	0
Yes	1	0	0	0	0	0	0	0	0	0	0	0
In part	0.5	1	1	1	1	0	0	0	0	0	0	0
No	0	29	29	29	29	30	30	30	30	30	30	30
8. Does it exist a formal and well defined process to identify or review potentially significant risks?		8	8.5	7.5	7.5	7	5.5	5.5	5.5	3.5	2.5	2.5
Yes	1	6	8	7	7	7	5	5	5	3	2	2
Not yet, but defining it	0.5	2	1	1	1	0	1	1	1	1	1	1
No	0	22	21	22	22	23	24	24	24	26	27	27
9. Has a formalized process been defined to evaluate risk appetite in accordance with shareholders?		0	0	0	0	0	0	0	0	0	0	0
Yes	1	0	0	0	0	0	0	0	0	0	0	0
No	0	30	30	30	30	30	30	30	30	30	30	30
10. Are company objectives, policies and tolerances for risks clearly communicated through the organization?		7	7.5	7	7	7	5.5	5.5	5.5	3.5	2.5	2.5
Yes	1	3	3	3	3	3	0	0	0	0	0	0
Only part	0.5	8	9	8	8	8	11	11	11	7	5	5
No	0	19	18	19	19	19	19	19	19	23	25	25
11. To whom does the Risk Manager/CRO (or other equivalent position) report to?		1	1	1	1	0	0	0	0	0	0	0
BOD	1	1	1	1	1	0	0	0	0	0	0	0
CFO	1	0	0	0	0	0	0	0	0	0	0	0
CEO	1	0	0	0	0	0	0	0	0	0	0	0
Controller	1	0	0	0	0	0	0	0	0	0	0	0
Not mentioned	0	29	29	29	29	30	30	30	30	30	30	30
12. Do interdisciplinary risk management teams exist to support the CRO (so that each functional area can understand where it fits into the entire company strategy and how it affects other areas)?		0	0	0	0	0	0	0	0	0	0	0
Yes	1	0	0	0	0	0	0	0	0	0	0	0

No	0	30	30	30	30	30	30	30	30	30	30	30
13. Are roles and responsibilities of everyone involved in the management of risks clearly documented and communicated?		3.5	3.5	3.5	3	3	2.5	2.5	2.5	2	2	2
Yes	1	1	1	1	1	1	0	0	0	0	0	0
Only part	0.5	5	5	5	4	6	5	5	5	4	4	4
No	0	24	24	24	25	24	25	25	25	26	26	26
14. Are risks integrated within scorecard or corporate performance measurement criteria?		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Yes	1	0	0	0	0	0	0	0	0	0	0	0
In part	0.5	1	1	1	1	1	1	1	1	1	1	1
No	0	29	29	29	29	29	29	29	29	29	29	29
15. Is risk tolerance threshold, defined by considering the risk appetite, applied to each organizational objective?		7.5	8	7.5	7.5	7.5	6	6	6	4	3	3
Yes, it is applied to each organizational objective	1	0	1	0	0	0	3	3	2	0	0	0
No, it is only applied to the most important organizational objectives	0.5	15	14	15	15	15	6	6	8	8	6	6
No, it isn't applied to any organizational objective	0	15	15	15	15	15	21	21	20	22	24	24
16. Is the incentive system for management linked to risk adjusted profitability measures?		0	0	0	0	0	0	0	0	0	0	0
Yes	1	0	0	0	0	0	0	0	0	0	0	0
No	0	30	30	30	30	30	30	30	30	30	30	30
17. Is risk management fully integrated across all functions and business units?		0	0	0	0	0	0	0	0	0	0	0
Yes	1	0	0	0	0	0	0	0	0	0	0	0
No	0	30	30	30	30	30	30	30	30	30	30	30

	Score	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
18. If a formal and well defined process to quantify risks exists: are quantitative or qualitative methods primarily used?		15.5	15.5	15.5	15.5	15.5	15.5	15.5	15.5	16	14.5	14.5
Quantitative methods	0.5	0	0	0	0	0	0	0	0	0	0	0
Qualitative methods	0.5	29	29	29	29	29	29	29	29	28	27	27
Both qualitative and quantitative methods	1	1	1	1	1	1	1	1	1	2	3	3
19. Does a periodic risk reporting system exist?		0	0	0	0	0	0	0	0	0	0	0
Yes	1	0	0	0	0	0	0	0	0	0	0	0
No	0	30	30	30	30	30	30	30	30	30	30	30
20. Does a register containing the list of identified risks and the potential responses exist?		11	11	11	11	11	11	11	11	1	1	1
Yes	1	11	11	11	11	11	11	11	11	1	1	1
No	0	19	19	19	19	19	19	19	19	29	29	29
21. Does the organization train employees on ERM?		0	0	0	0	0	0	0	0	0	0	0
Yes	1	0	0	0	0	0	0	0	0	0	0	0
No	0	30	30	30	30	30	30	30	30	30	30	30
22. Has a specific ERM standard been adopted?		0	0	0	0	0	0	0	0	0	0	0
Yes	1	0	0	0	0	0	0	0	0	0	0	0
No	0	30	30	30	30	30	30	30	30	30	30	30
Total score		94	98	92.5	92	85	75	75	75	48.5	40	40
Percentage		4.27	4.4	4.2	4.1	3.8	3.4	3.4	3.4	2.2	1.8	1.81

The ERMI Checklist Score Results for The 30 Private Companies for Each Year From 2011 to 2021*:

Years	Score	Total score										
		2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
1. Does the organization have an ERM program (process) in place?		29	29	29	28	28	27	25	25	23	23	20
Yes	1	29	29	29	28	28	27	25	25	23	23	20
Not yet, but implementing it	0.5	0	0	0	0	0	0	0	0	0	0	0
No	0	1	1	1	2	2	3	5	5	7	7	10

	Score											
2. Has a RM/ CRO been designated in charge for enterprise-wide risk management?		1	0	0	0	0	0	0	0	0	0	0
Yes	1	1	0	0	0	0	0	0	0	0	0	0
No	0	29	30	30	30	30	30	30	30	30	30	30
3. Has an ERM policy been defined?		19.5	19.5	19.5	18.5	18	17.5	16.5	16.5	14.5	14	12
Yes	1	19	19	19	9	9	9	9	9	8	8	7
Not yet, but defining it	0.5	1	1	1	19	18	17	15	15	13	12	10
No	0	0	10	10	2	3	5	6	6	9	10	18
4. Is the ERM integrated with strategic and business plans?		29	29	29	28	28	27	25	25	23	23	20
Yes	1	29	29	29	28	28	27	25	25	23	23	20
In part	0.5	0	0	0	0	0	0	0	0	0	0	0
No	0	1	1	1	2	2	3	5	5	7	7	10
5. Who is the prime sponsor of ERM in the organization?		9	8	8	8	8	8	8	8	8	7	5
BOD	1											
CFO	1	9	8	8	8	8	8	8	8	8	7	5
CEO	1											
Internal Auditor	1											
Not mentioned	0	0	0	0	0	0	0	0	0	0	0	0
6. Does a dedicated ERM function exist in the organization?		3	2	2	2	2	2	1	1	1	1	1
Yes	1	3	2	2	2	2	2	1	1	1	1	1
No	0	0	0	0	0	0	0	0	0	0	0	0
7. Is it clearly specified who is accountable for every identified risk as well as who is responsible for controls to treat the risk?		0	0	0	0	0	0	0	0	0	0	0
Yes	1	0	0	0	0	0	0	0	0	0	0	0
In part	0.5	0	0	0	0	0	0	0	0	0	0	0
No	0	30	30	30	30	30	30	30	30	30	30	30
8. Does it exist a formal and well defined process to identify or review potentially significant risks?		1	0	0	0	0	0	0	0	0	0	0
Yes	1	1	0	0	0	0	0	0	0	0	0	0
Not yet, but defining it	0.5	0	0	0	0	0	0	0	0	0	0	0
No	0	29	30	30	30	30	30	30	30	30	30	30

9. Has a formalized process been defined to evaluate risk appetite in accordance with shareholders?		0	0	0	0	0	0	0	0	0	0	0
Yes	1	0	0	0	0	0	0	0	0	0	0	0
No	0	30	30	30	30	30	30	30	30	30	30	30
10. Are company objectives, policies and tolerances for risks clearly communicated through the organization?		1	0	0	0	0	0	0	0	0	0	0
Yes	1	1	0	0	0	0	0	0	0	0	0	0
Only part	0.5	0	0	0	0	0	0	0	0	0	0	0
No	0	29	30	30	30	30	30	30	30	30	30	30
11. To whom does the Risk Manager/CRO (or other equivalent position) report to?		1	0	0	0	0	0	0	0	0	0	0
BOD	1	1	0	0	0	0	0	0	0	0	0	0
CFO	1	0	0	0	0	0	0	0	0	0	0	0
CEO	1	0	0	0	0	0	0	0	0	0	0	0
Controller	1	0	0	0	0	0	0	0	0	0	0	0
Not mentioned	0	29	30	30	30	30	30	30	30	30	30	30
12. Do interdisciplinary risk management teams exist to support the CRO (so that each functional area can understand where it fits into the entire company strategy and how it affects other areas)?		0	0	0	0	0	0	0	0	0	0	0
Yes	1	0	0	0	0	0	0	0	0	0	0	0
No	0	30	30	30	30	30	30	30	30	30	30	30
13. Are roles and responsibilities of everyone involved in the management of risks clearly documented and communicated?		0	0	0	0	0	0	0	0	0	0	0
Yes	1	0	0	0	0	0	0	0	0	0	0	0
Only part	0.5	0	0	0	0	0	0	0	0	0	0	0
No	0	30	30	30	30	30	30	30	30	30	30	30
14. Are risks integrated within scorecard or corporate performance measurement criteria?		0	0	0	0	0	0	0	0	0	0	0
Yes	1	0	0	0	0	0	0	0	0	0	0	0
In part	0.5	0	0	0	0	0	0	0	0	0	0	0

No	0	30	30	30	30	30	30	30	30	30	30	30

15. Is risk tolerance threshold, defined by considering the risk appetite, applied to each organizational objective?		15	15	15	14.5	14.5	14	12.5	12.5	11.5	11.5	10
Yes, it is applied to each organizational objective	1	0	0	0	0	0	0	0	0	0	0	0
No, it is only applied to the most important organizational objectives	0.5	30	30	30	29	29	28	25	25	23	23	20
No, it isn't applied to any organizational objective	0	0	0	0	1	1	2	5	5	7	7	10
16. Is the incentive system for management linked to risk adjusted profitability measures?		0	0	0	0	0	0	0	0	0	0	0
Yes	1	0	0	0	0	0	0	0	0	0	0	0
No	0	30	30	30	30	30	30	30	30	30	30	30
17. Is risk management fully integrated across all functions and business units?		0	0	0	0	0	0	0	0	0	0	0
Yes	1	0	0	0	0	0	0	0	0	0	0	0
No	0	30	30	30	30	30	30	30	30	30	30	30
18. If a formal and well defined process to quantify risks exists: are quantitative or qualitative methods primarily used?		16	15.5	15.5	15	15	15	15	15	15	15	15
Quantitative methods	0.5	0	0	0	0	0	0	0	0	0	0	0
Qualitative methods	0.5	28	27	27	30	30	30	30	30	30	30	30
Both qualitative and quantitative methods	1	2	3	3	0	0	0	0	0	0	0	0
19. Does a periodic risk reporting system exist?		0	0	0	0	0	0	0	0	0	0	0
Yes	1	0	0	0	0	0	0	0	0	0	0	0
No	0	30	30	30	30	30	30	30	30	30	30	30
20. Does a register containing the list of identified risks and the potential responses exist?		29	29	29	28	28	27	25	25	23	23	20
Yes	1	29	29	29	28	28	27	25	25	23	23	20
No	0	1	1	1	2	2	3	5	5	7	7	10

21. Does the organization train employees on ERM?		0	0	0	0	0	0	0	0	0	0	0
Yes	1	0	0	0	0	0	0	0	0	0	0	0
No	0	30	30	30	30	30	30	30	30	30	30	30
22. Has a specific ERM standard been adopted?		0	0	0	0	0	0	0	0	0	0	0
Yes	1	0	0	0	0	0	0	0	0	0	0	0
No	0	30	30	30	30	30	30	30	30	30	30	30
Total score		154	147	147	142	142	138	127	127	117	116	99.5
Percentage		6.98	6.68	6.68	6.45	6.43	6.25	5.77	5.77	5.32	5.25	4.52

*The ERMI Checklist (Source: An ERM Maturity Model, Monda and Giorgino, 2013:p.14). This table is used to calculate the ERM index – as an indicator for Enterprise risk management. It is calculated as a percentage from the total score of the checklist for each company each year (2011 -2021). The researcher has modified Monda and Giorgino (2013)'s model scores for more convenience results.