The Impact of Earnings Quality on the Corporate Financial Distress: Empirical Evidence from Egypt

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The Impact of Earnings Quality on the Corporate Financial Distress: Empirical Evidence from Egypt

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Abstract:

Purpose - This paper examines the influence of earnings quality on the financial distress of firms registered on the Egyptian Stock Exchange.

Design/methodology/approach- It scrutinizes a sample of 85 listed firms on the Egyptian Stock Exchange throughout the period 2015-2019 with 425 observations. Earnings quality is measured by accrual quality and financial distress is determined by Altman Z- score. The results are derived according to regression analysis, Pearson correlation, discriminant analysis and sensitivity analysis.

Findings - The results demonstrated a adverse substantial relationship between earnings quality and financial distress. The results support the notion that earnings quality has a significantly impacts financial distress. Furthermore, results indicated that there is a positive substantial influence of leverage on financial distress in Egypt.Additionally.the results revealed that there is a significant discriminant among the Egyptian industries or sectors concerning earnings quality and financial distress.

Practical implication - The results highlight the contribution of earnings quality to financial distress within emerging markets. In addition, the study adds to the existing literature concerning earning quality model and its consequences for the decision making process related to the shareholders and stakeholders and other internal and external users of financial reports.

Originality/ value – The study provides novel empirical evidence related to the earnings quality consequences of the financial distress in the Egyptian context.

Keywords: Earnings Quality, Altman Z-score, Predicting Financial Distress.

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1. Introduction:

Earning quality has become a significant tool in evaluating the goinig concern of firms besides improving the decision-making process of shareholders, stakeholders, financial analysts, and investors. Several attempts have been made to examine the consequences of earning quality on firm value (e.g. Dang *et al*, 2020; Nuris and Juliardi, 2017). A series of research has examined the relationship between earnings quality as well as corporate governance (e.g. Siyanbola et al, 2019; Jiang *et al*, 2008). Another series of research examined the correlation between earning quality as well as cost of capital (e.g. Aboody *et al*., 2005; Nikoomaram *et al*., 2011; Eliwa *et al.,* 2016). In brief, the systematic review of earnings quality has indicated a degree of opacity related to earnings quality, especially its definition, measurement and its consequences. Although there is no consensus on earnings quality definition, it can be defined according to fold theories. First, decision usefulness theory indicates that high earnings quality is much more useful for investment decisions.On the contrary, low earnings quality is less useful for decision making process. Second, earnings attributes theory defines earnings quality according to precise attributes of earnings such as persistence, predictability, relevance, and timeliness. Consequently, high earnings quality refers to earnings persistence and vice versa.

Moreover, earning quality measurement is one of the most controversial notion in extant accounting literature as there are several proxies for measuring earning quality such as persistence of earnings, accruals quality, earnings predictability, value relevance and earnings timeliness (e.g.Perotti and Wagenhofer, 2014; Eliwa *et al*., 2016; Krishnan and Zhang, 2019; Hoang et al., 2017; Dechow et al., 2010; Carmo *et al.*, 2016; Sun *et al.*, 2020; Gberegbe, 2019; Hung and Van, 2020). Likewise, prior research has revealed that earning quality impacts significantly financial reporting quality and cost of capital (Aboody *et al*, 2005). Otherwise, a significant number of studies on financial distress have been published. For instance, UI Hassan et al (2017) stated that financial distress is one of the most important issues and its prediction models can be classified in two common models namely logistic regression models and discriminant analysis. Muljono and Suk (2018) investigated the influence of financial distress on earnings management in Indonesia throughout the

interval from 2005-2014. Their results revealed that the higher financial health, the greater the volume of real earnings management and the slighter financial health the greater magnitude of accrual earnings management.

Moreover, Raza *et al.* (2020) have presented several theories that explain the financial distress such as agency theory, trade-off theory, cash management theory, signaling theory, stewardship theory and stakeholder theory. Altman *et al.* (2017) presented a comprehensive international analysis of financial distress according to different models such as multiple discriminant analysis (Altman, 1968), logit model (Ohlson, 1980), probit model (Zmijewski, 1984). In the same context, previous research (Jacoby *et al.*, 2019; Ranjbar *et al.*, 2018; Pernamasari *et al.*, 2019; Dirman, 2020) concluded that financial distress has become a matter of interest for professional organizations and firms in order to examine firm financial health.

However, insignificant consideration has been paid to the association between earning quality and financial distress of Egyptian listed firms. Accordingly, the main motivation behind the problem of the study is to investigate the effect of earnings quality on financial distress throughout the Egyptian Stock Exchange as one the emerging markets. Consequently, the present study aims to investigate the impact of earnings quality on the probability of financial distress of Egyptian listed firms, in addition to determining whether or not earnings quality relates significantly with financial distress in order to evaluate and clarify the opacity concerning the correlation between earnings quality and financial distress in preceding research (Ogwoka *et al*, 2020; El-Deeb *et al*, 2020; Saleh *et al*, 2020; Hussain *et al*, 2020).

This study depends on the data of Egyptian Stock Exchange as an exclusive context because of the political stability, economic reform and recent improvement of legislations in Egypt especially after the political events in 2011. This study donates to the extant literature in different methods. First, it enriches the theme on earnings quality and financial distress. Second, based on practice, it provides new evidence derived from emerging markets. Third, based on theory, it contributes to the establishment of a conceptual framework for the correlation between

earnings quality as well as financial distress. Accordingly, the residual of the study is structured as follows. In the second division, we review prior efforts and theories to develop hypotheses. Third division includes the methodology and empirical model. The fourth division discusses the findings. The fifth division shows the sensitivity analysis whereas conclusions are accessible in sixth division.

2. Literature review and hypotheses development:

This section presents the literature revies concerning earninigs quality and financial distress as follows.

2.1 Earnings Quality

Earnings quality has key consequences for accounting issues such as cost of capital, financial forecasts,and performance evaluation, dividends,investment efficiency, firm value financial leverage, and firm going concern, the external as well as financial statement internal users (e.g. Ezat, 2019).Consequently, external as well as financial statement internal users are interested in earnings quality theme and this means that earnings quality increases when it enhances the decision of different stakeholders and vice versa (Dechow et al., 2010).

Otherwise, another series of research has defined earnings quality based on earnings characteristics. Earnings quality is defined according to decision such as persistence, predictability, relevance...etc. Accordingly, when earnings are persistent, predictable or relevant earnings quality increases (e.g. Sun et al., 2020; Gberegbe, 2019; Hung and Van, 2020). Although extensive research has been carried out on earnings quality measurement, there is no consensus concerning how to measure earnings quality as extant literature refers to several quantitative models such as earnings persistence, accruals quality, earnings predictability, earnings timelines as well as earnings value relevance (Jones, 1991; Dechow *et al.*, 2002; Francis *et al.*, 2003; Pagalung *et al.*, 2012). Table 1 presents the most common models of earning quality measurement in the literature especially accrual quality, persistence, predictability, value relevance and timeliness as follows:

Table 1: Earning quality measurement

No.	Attribute	Measurement	Decision rule	Reference
١	Accrual Quality	Mapping the current accrual towards the past, present and future cash flow.	The higher accrual quality the higher earnings quality.	(Dechow *et al.*, 2002)
٢	Persistence	The regression coefficient of current earnings towards the future earnings (Model AR1).	The higher adjusted R^2, the higher earnings quality.	(Francis *et al.*,(2003b)
3	Predictability	The standard deviation of model ARI error	The higher adjusted R^2, the higher predictability and higher earnings quality. Lower standard deviation refers to better earnings predictability that refers to a higher earnings quality.	(Lougee *et al*, 2002; Francis *et al.*, 2003a)
4	Value Relevance	The explanatory power or degree of return regression towards earnings.	The higher adjusted R^2, the higher earnings value relevance that reverses higher earnings quality.	(Brown *et al.*,2001)
5	Timeliness	The explanatory power or degree of earnings reversal regression towards return	The higher asymmetric timeliness coefficient represents a higher earnings quality.	(Francis *et al.*, 2004)

Sources: Pagalung *et al.* (2012)

2.2 The Financial Distress:

Mehrani et al (2017) compared the earnings quality using two samples of distressed and healthy firms in Tehran Stock Exchange throughout the period 2006-2015 with 211 firms each sample.The findings indicated that increase of earnings quality mitigate the probability of financial distress. In other words, there is an adverse relationship between earnings quality and financial distress of firms in Tehran stock exchange. Ibrahim (2014) examined the relationship between the earning quality and the financial distress of 50 Egyptian firms throughout the period (2001-2010). The results revealed that the exposure of financial distress based on the earnings persistence as a proxy of earning quality. Rakshit et al. (2020) investigated the relationship between earnings management as well as financial distress using 30 firms in India through the period 2010-2019. The measurement of earnings management as well as financial distress was according to discretionary accruals and Altman's Z-score, respectively. The main findings indicated that financial distress significantly and negatively impacts the earning management. In other words, in distressed firms, managers encounter much more challenges and restrictions to manipulate earnings because these firms are subject to scrutiny from stakeholders.

Habib et al. (2020) reviewed the literature concerning the elements of financial distress. They presented extensively the main models for financial distress measurement (e.g. Altman, 1968; Ohlson, 1980; Zmijewki, 1984). Moreover, a series of research has been inspected the different causess of financial distress. For instance, Al- Hady et al. (2017) scrutinized the association between financial distress and corporate social responsibility throughout the period 2007-2013. Their findings indicate that positive CSR decreases financial distress and vice versa.

Concerning the prediction of financial distress, a series of prior research has been conducted. For instance, Zhang (2015) examined the effect of R&D investments on financial distress in USA through the period 1980-2011.The findings revealed that the higher R&D investment during economic downturn causes higher probability of financial distress. Magee

(2013) scrutinized the impact of foreign coinage hedging on financial distress in USA during the period 1996-2000.The results revealed that currency hedging significantly diminishes financial distress.Kane *et al.*(2005) examined the effect of employee relations on financial distress throughout the period 1991-2001. Their findings demonstrated that firms with bad employee relations experience much more financial distress.Darrat *et al.*(2016) examined the effect of governance on financial distress during the period 1996-2006 in USA,and their findings revealed that slighter boards and a lower percentage of insider managers increase the occurrence of financial distress. Parker *et al.* (2002) examined the relationship between governance and financial distress in USA using 176 firms during the period 1988-1996.

Concerning financial distress magnitudes, various attempts have been made in existing literature to clarify this notion. For instance, Jaggi and Lee (2002) concluded that distressed firms intentionally use income increasing accruals in order to manage debts covenants. Otherwise, Jubb *et al*. (1996) examined the effect of financial distress on audit fees in Western Australia and concluded that distressed firms have slighter fees because firms are under scan and in liquidity pressure that causes audit fees to decrease. Richardson *et al.*(2015) examined the effect of financial distress in USA on tax avoidance throughout the period 2006-2010.Their findings revealed that financial distress has a significant positive impact on tax avoidance. Molina and Preve (2012) concluded that financially distressed firms are prone to extend the level of trade credit. DeAngelo and DeAngelo (1990) scrutinized the impact of financial distress ondividend policy payments in USA during the period 1980-1985. They concluded that distressed firms apply early and aggressive dividend reductions. Theodossiou *et al.(*1996) indicated that distressed firms are acquired in case of poor managerial efficiency, low insider control, low leverage and high level of productive assets. Jostarndt and Sautner (2008) have documented that distressed firms decline the ownership concentration to achieve a gradual change towards external ownership. Holder-webb and

Cohen (2007) documented that distressed firms are motivated to increase disclosure quality. Chang *et al.* (2016) indicated that distressed firms are more likely to increase new CEO compensations.

Researchers have shown an increased interest regarding financial distress measurement as there are different methods as follows. First, the majority of studies measure financial distress according to Altman z-score (Jacoby *et al.,*2016; Richardson *et al.,*2015; Lee et al.,2017; Al-Hadi *et al.,*2017; Kane *et al.,*2005; Kallunki and Pyykko,2013; Tykvova and Borell,2012) and we follow this series of research in measuring financial distress of listed Egyptian firms. Second, financial distress is measured according to Ohlson o-score (e.g. Tykvova and Borell, 2012; Kallunki and Pyykko, 2013; Charitou et al., 2011). Third, financial distress is measured according to Zmijewski z-score (e.g. Lee et al., 2017). Fourth, prior research measured financial distress based on Cambell model (e.g.Simlai, 2014) or based on Merton model (e.g.Lian, 2017; Magee, 2013; Schultz et al., 2017). Fifth, there are several proxies which are used separately in extant literature to measure financial distress such as logistic regression (Tennyson *et al.,*1990; Darrat *et al.,*2016; Lu *et al.,*2008), negative cash flows or losses (DeAngelo *et al.,*1994; Xu *et al.,*2013; Bhaskar et al., 2017; DeAngelo and DeAngelo,1990).

In brief, from the aforementioned discussion, we aim to examine the hypotheses as follows.

H1:   There is a negative significant relationship between earnings quality and financial distress of listed Egyptian firms.

H2   Earnings quality significantly impacts financial distress of listed Egyptian firms.

H3   Leverage significantly impacts the financial distress of listed Egyptian firms.

H4   There is significant discriminant among firms in different sectors according to earnings quality.

H5   There is significant discriminant among firms in different sectors according to possibility of financial distress.

3. Research Design:

3.1 Population, Sample and Data Collection:

The population includes firms listed on the Egyptian Stock Exchange within different sectors throughout the period 2015-2019. The sample comprises 85 firms that were selected according to specific criteria as follows. First, financial institutions were excluded because of their special nature, and they are subjected to special laws and legislations. Second, public business sector companies were excluded as they were subject to audit by the Central Auditing Organization. Third, the firms whose shares are continuously traded in the Egyptian stock exchange without any stoppage during the period were selected. Fourth, firms with complete financial data during the period were selected. Consequently, the final sample consists of 85 firms within 15 sectors as shown in Table 2. Data were composed from the published financial reports of the firms, the official website of the Egyptian Stock Exchange, Mubasher website and the websites of the firms on the internet.

Table 2: Sample's structure

No.	Sector	N	%
1	Basic Resources	4	5%
2	Trade & Distributors	4	5%
3	Building Materials	14	16%
4	Food, Beverages and Tobacco	13	15%
5	Health Care & Pharmaceuticals	6	7%
6	Energy & Support Services	2	2%
7	Textile & Durables	9	11%
8	Real Estate	11	13%
9	Trade & Distributors	3	4%
10	Media	1	1%
11	IT	3	4%
12	Communication Services	3	4%
13	Travel & Leisure	5	6%
14	Utilities	1	1%
15	Industrial Goods , Services and Automobiles	6	7%
Total		**85**	**100%**

3.2 Measurement of variables

Financial distress is determined according to Altman z-score commonly used in the majority of preceding research (Jacoby *et al.*,2016; Richardson *et al.*,2015; Lee *et al.*,2017; Al-Hadi et al.,2017; Kane et al.,2005; Kallunki and Pyykko,2013; Tykvova and Borell,2012) with the following formula:

$$Z\text{-Score} = 1.2 * X_1 + 1.4 * X_2 + 3.3 * X_3 + 0.6 * X_4 + 1.0 * X_5 \quad \text{.......(1)}$$

Where X_1 refers to working capital/ total assets. X_2 refers to retained earnings/total assets. X_3 refers to earnings before interest and taxes/total assets. X_4 refers to market value equity/book value of total debt. X_5 refers to sales/total assets. Z –Score refers to the overall Index. The decision rule of this model comprises of three alternatives as follows. First, the z-score is more than 2.67, which refers to financial soundness of the firm. Second, z-score is less than 1.81, which implies that the firm is likely to be financially distressed. Third, z-score is in between 1.18 and 2.67, which refers that the firm is located in a grey area.

Although, the extant accounting literature includes several methods to measure earning quality the current paper depends on modified accrual quality model as it has been commonly used in previous research (Hussain *et al.*, 2020; Saleh *et al.*, 2020; Ibrahim, 2014) according to the following formula:

$$\text{Total Accruals}_{it} / \text{Assets}_{it-1} = \beta_0 + \beta_1 (1/ \text{Assets}_{it-1}) + \beta_2 \Delta\text{Rev}_{it}/ \text{Assets}_{it-1} + \beta_3 \overline{\text{PPE}}_{it}/ \text{Assets}_{it} + \beta_4 \text{ROA}_{it-1} + e_{it} \quad \text{.....(2)}$$

Where total accrual refers to accruals that is calculated by the operating income of firm i at time t minus its operating cash flow. Assets_{it-1} refers to beginning total assets of firm i at time t. Δ Rev refers to change in sales revenues minus change in account receivables of firm i at time, t. PPE_{it} refers to fixed assets (e.g. plant, property, and equipment) of firm i at time t. ROA_{it} refers to return on assets of firm i at time t. e_{it} refers to the model error.

Moreover, the study utilized some control variables such as leverage (LEV) computed by total debt divided by total assets (e.g. Jacoby et al., 2019; Al-Najjar, 2011; Rajab, 2018) and return on equity (ROE) measured by Net income after taxes on net equity (Kazemian *et al.*, 2017; Saleh *et al.*, 2020), firm size (SIZE) as the logarithm of total assets (e.g. Al- Najjar, 2011; Jacoby et al., 2019), audit quality (AuditQ) as adummy variable that takes one for big 4 audit firm and zero otherwise (Chan et al., 2013; Al-Mamun et al., 2014), firm age (AGE) as natural logarithm of the firm age (e.g. Jacoby et al., 2019),earnings per share (EPS) and cash flow from operations (CFO).

3.3 Empirical model

Multiple linear regression was used to examine the hypotheses, and the model can be stated as the following equation:

$$\text{Z-score}_{it} = a_0 + \beta_1 EQ + \beta_2 LEV + \beta_3 ROE + \beta_4 Size + \beta_5 AuditQ + \beta_6 AGE + \beta_7 EPS + \beta_8 CFO + \varepsilon_{i,t} \ldots\ldots\ldots\ldots\ldots(3)$$

Where a_o refers the model constant. β_1 to β_8 refer to the model coefficients, z-score refers to the financial distress. EQ_{it} refers to the earning quality of the firm i at time t. LEV_{it} refers to the leverage of the firm i at time t. ROE_{it} refers to the return on equity of the firm i at time t. Size refers to the size of the firm i at time t $AuditQ_{it}$ refers to the audit quality of the firm i at time t. AGE_{it} refers to the age of the firm i at time t while EPS refers to the earnings per share of the firm i at time t. CFO_{it} refers to the operating cash flow of the firm i at time t whereas $\varepsilon_{i,t}$ refers to the model error.

4. Findings

4.1 Descriptive Statistics

A set of statistical descriptive statistics (e.g. mean, standard deviation, range, maximum, minimum) were utilized to for data analysis. Table 3 displays the descriptive statistics for the variables included in the empirical model.

Table 3: Descriptive Statistics

Variables	N	Range	Minimum	Maximum	Mean	Std. Deviation
Z_score	425	113.73	0.00	113.73	4.05	8.14
EQ	425	18.86	1.36	20.22	6.27	5.29
LEV	425	65.85	.02	65.87	3.90	5.30
ROE	425	7.96	0.00	7.96	0.20	067
Size	425	7.29	3.41	10.70	8.58	0.98
AuditQ	425	1.00	0.00	1.00	0.47	0.49
AGE	425	0.75	1.20	1.95	1.46	0.17
EPS	425	38.00	0.00	38.00	2.10	4.30
CFO	425	5.13	4.03	9.16	7.00	1.02

As shown in the above table the mean of Z- score equals 4.05 with a maximum and minimum value by 113.73 and 0.00 respectively. The mean of earnings quality (EQ) is 6.27 and the maximum and minimum values are 20.22 and 1.36 correspondingly.In the same context, the mean of leverage (LEV), return on equity (ROE) , size, a udit quality, age and earnings per share are estimated by 3.90, 0.20, 8.58, 0.47, 1.46, 2.10 respectively. Moreover, the standard deviation of prior variables is 5.30, 0.67, 0.98, 0.49, 0.17and 4.30 respectively.

4.2 Data Normality

We measured the normal distribution of data according to the significance value of Kolmogorov-Smirnov as the data follow a normal distribution when sig. value is much more 5% and data do not follow normal distribution. Table 4 shows that the significance value for all variables equals 0.000 implying that the data for variables do not follow the normal distribution. However, the size of the sample is a larger than 30 as it consists of 425 observations. Consequently, it is concluded that the distribution of data does not affect the validity of results.

Table 4: Kolmogorov-Smirnov Test

Variable	EQ	LEV	ROE	Size	AuditQ	AGE	EPS	CFO
N	425	425	425	425	425	425	425	425
Mean	6.27	3.90	0.20	8.58	0.47	1.46	2.10	7.00
Std. Deviation	5.29	5.30	0.67	0.98	0.49	0.17	4.30	1.02
MED absolute	0.24	0.25	0.38	0.09	0.35	0.10	0.31	.07
MED ositive	0.24	0.25	0.31	0.07	0.35	0.10	0.26	.07
MED negative	-0.17	-0.24	-0.38	-0.09	-0.32	-0.08	-0.31	-.07
K.S . Z	5.06	5.25	7.85	1.94	7.34	2.15	6.45	1.63
Sig	0.00	0.00	0.00	.00	0.00	.00	0.00	0.01
MED refers to most extreme differences and K.S. Z refers to Kolmoggrov- Smirnov Z.								

4.3 Variance Inflation Factor

VIF was used to examine the existence of collinearity problem. In sum, prior research refers to the absence of collinearity problem in regression models when VIF value is less than 10.Table 6 refers to the values of VIF concerning independent variables.

Table 5: Coefficient of variance inflation factor

Variable	Collinearity Statistics	
	Tolerance	VIF
EQ	.934	1.070
LEV	.973	1.028
ROE	.985	1.015
Size	.970	1.030
AuditQ	.946	1.057
AGE	.980	1.020
EPS	.986	1.014
CFO	.976	1.025

As shown in the above table, all values of VIF of independent variables is less 10. As a result, the regression model of financial distress over earnings quality does not suffer from collinearity problem.

4.4 Correlation Coefficients

Pearson correlation coefficient was mainly utilized to scrutinize the association between possibility of financial distress of firms and earnings quality according to 3 dimensions which are significance, strength and direction. As shown in Table 6, the results of Pearson coefficients indicates that the financial distress has a negative and insignificant relationship with earnings quality as the Pearson coefficient equals - 0.07 and this result is consistent with prior research. Consequently, the first hypothesis that refers to a negative relationship between possibility of financial distress and earnings quality is accepted.In addition, the outcomes revealed that there is a positive significant correlation between financial stress and LEV as the coefficient equals .23**.

Table 6: Pearson correlation coefficients

	Z_score	EQ	LEV	ROE	Size	AuditQ	AGE	EPS	CFO
Z_score	1								
EQA	-.070	1							
LEV	.751**	-.033	1						
ROE	.031	-.081	.052	1					
Size	-.103*	-.061	-.099*	-.044	1				
AuditQ	.053	.215**	.007	.035	.012	1			
AGE	.041	.064	.039	.004	.054	.033	1		
EPS	-.042	-.010	-.043	.001	.098*	.046	.006	1	
CFO	-.069	-.024	-.099*	.024	.044	.035	.094	.035	1

Note: * and ** mean that correlation is significant at 5% and 1% separately.

4.5 Regression Coefficients

Linear regression was utilized to investigate the impact of earnings quality on the possibility of financial distress.Table 7 displays the outcomes of the regression analysis

Table 7: The outcomes of regression analysis

Variables	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Constant	1.022	3.508		.291	.771
EQ	-.097	.051	-.063-	-1.896	.050
LEV	1.143	.050	.745	22.866	.000
ROE	-.195	.392	-.016	-.498	.619
Size	-.282	.269	-.034	-1.047	.296
AuditQ	1.020	.538	.063	1.896	.059
AGE	.765	1.529	.016	.500	.617
EPS	-.020	.061	-.011	-.334	.739
CFO	.012	.258	.001	.046	.963
R	.755				
R^2	.571				
Adj. R^2	.562				
P-value	.000				
F statistics	69.136				
DW statistics	1.501				
N	425				

As shown in the Table 7, earnings quality has a substantial negative influence on the possibility of financial distress as the regression coefficient equals -.097 and significance value equals 0.050. One potential explanation is that lower earnings persistence accelerates the possibility of financial distress of listed firms of the Egyptian Stock Exchange. Moreover, timeliness is one of the main attributes of earnings and higher timeliness of disclosure of bad news accelerates the financial distress of

listed firms in the Egyptian Stock Exchange. Second, distressed firms intentionally manage their earnings toward the target level. Hence, managerial opportunistic behavior within distressed firms decreases earnings quality. Third, the linkage between earnings quality and distressed firms is not monotonic because of the variety of timeliness of bad news, good news and growth. Fourth, accrual earnings management regardless through accrual or real activities creates lower levels of earnings quality that causes an elevated possibility of financial distress. This result is steady with research (Charitou *et al*., 2011; Ibrahim, 2014; El-Deeb *et al.*, 2020; Jacoby *et al.*,2019). Accordingly, the second hypothesis refers to a significant impact of earning quality on financial distress regarding the listed firm in the Egyptian stock exchange.

Moreover, leverage significantly impacts the financial distress as the regression coefficient equals 1.143 and the significance value amounts 0.000. This conclusion implies that an increase in leverage ratio increase the possibility of financial distress because of adjustments of convents of debts. This result is steady with previous research (e.g. El-Deeb *et al.*, 2020).

On the contrary, other variables especially return on equity, firm size, audit quality, age, earnings per share and cash flow from operations have insignificant impact on the possibility of financial distress as the significance values are 0.719, 0.362, 0.064, 0.574, 0.668, and 0.652, respectively. To sum up, adjusted R^2 equals .562 that implies that independent variables explain approximately 56.2% of the change in the dependent variable that refers to the financial distress. The value of e Durbin-Watson equals 1.501 that indicates that there is no autocorrelation problem between independent variables within the regression model. In addition, the VIF values of independent variables are less 10 that implies that there is no mulicollinearity problem between independent variable in the model. Accordingly, based on the above discussion the empirical equation of prediction of financial distress from the Egyptian context can be as follows.

Z-score = 1.022 -0.097 EQ + 1.143 LEV -0.195 ROE -0.282 Size + 1.020 AuditQ + .765 AGE -0.020 EPS + 0.012 CFO

4.6 Discriminant Analysis

Table 8 shows the results of discriminant analysis among listed firms in different Egyptian industries or sectors according to earnings quality and financial distress (Z-score is a proxy for financial distress). The results indicated that there is a significant discriminant between Egyptian sectors according to earnings quality and financial distress. The results revealed that the value of significance for earnings quality and financial distress equals 0.000 which proves the significant discriminant among 13 Egyptian sectors regarding the both of prior variables. Accordingly, the fourth hypothesis and fifth hypothesis are accepted. Moreover, the coefficients of discriminant analysis are negative within all Egyptian sectors. The Eigenvalue for earnings quality and financial distress equals 0.869 and 0.148 respectively. In the same context, the coefficient of Wilk's Lambda for earnings quality and financial distress equals 0.535 and 0.871 individually. Likewise, the value of Chi-square for earnings quality and financial distress equals 260.759 and 57.415 correspondingly. Finally, the Canonical correlation coefficient for earnings quality and financial distress equals 0.680 and 0.359 respectively. Prior results refer that there is a significant discriminant among Egyptian firms which are listed in different sectors in the Egyptian Stock Exchange concerning the earnings quality and financial distress.

Table 8 :Coefficients of discriminant analysis among firms in different sectors

Sector*	1	2	3	4	5	6	7	8	9	10	11	12	13
EQA	0.955	0.843	0.213	0.383	0.196	0.228	0.658	0.144	0.147	0.187	0.134	0.616	0.965
(Constant)	-9.595	-8.045	-2.916	-3.696	-2.860	-2.967	-5.906	-2.724	-2.732	-2.835	-2.704	-5.490	-9.741
Parameters	Sig.= 0.000 Eigen value = 0.869 Wilk's Lambda = 0.535 Chi-square = 260.759 Canonical corr.= 0.680												

Z_score	.041	.170	.066	.051	.117	.055	.044	.054	.107	.075	.271	.049	.041
(Constant)	-2.615	-3.419	-2.694	-2.643	-2.970	-2.656	-2.622	-2.653	-2.904	-2.732	-4.747	-2.635	-2.614
Parameters	Sig.= 0.000 Eigen value = 0.148 Wilk's Lambda = 0.871 Chi-square = 57.415 Canonical correlation = 0.359												

*Numbers 1,2,3,4,5,6,7,8,9,10,11,12 and 13 refer to the Egyptian sectors which are Communication,Media, Food,beverage and Tobacco,Construction,Technology,Industrial goods, Services and automobile,Health care and pharmaceuticals,Gas,Utlities,Trade and distributor,Chemicals,Real estate, and Basic resources respectively throughout the period 2015-2019.

5. Sensitivity Analysis

In current section, we further repeat the regression analysis with additional independent variable that determines the interrelationship between earnings quality and leverage and its influence on financial distress. The outcomes are similar the adj. R^2 of regression model before and after the modification equals 56.2% and 56.3% respectively. Recent results indicate that there is a negative impact of the interrelationship between earnings quality and leverage on the possibility of financial distress. The modified regression model support the notion regarding the interrelationship between leverage and earnings on the financial distress and this can be stated as follows.

$$Z\text{-score} = 0.519 - 0.050 \text{ EQ} + 1.191 \text{ LEV} - 0.194 \text{ ROE} - 0.297 \text{ Size} + 0.984 \text{ AuditQ} + 1.042 \text{ AGE} - 0.021 \text{ EPS} + 0.017 \text{ CFO} - 0.012 \text{ EQ*LEV}$$

6. Conclusions:

This study encompasses the empirical research regarding prediction of financial distress by examining the influence of earning quality on the financial distress of listed firms of Egyptian stock exchange. We also consider the impact of interrelationship between earning quality and leverage on the possibility of financial distress in listed firm in the Egyptian stock exchange. The study utilized a sample of 85 firms listed on the Egyptian Stock Exchange within 15 sectors throughout the period 2015-2019. The results showed a negative significant relationship between earnings quality and financial distress. Also, results present empirical evidence regarding inverse effect of earnings quality on the financial distress. The results refer to the direct impact of leverage on possibility of financial distress. The findings also demonstrate the interrelationship between earnings quality and leverage on the possibility of financial distress through sensitivity analysis as there is there is a negative impact of the interrelationship between earnings quality and leverage on the possibility of financial distress.

The results also support the hypothesis that the higher leverage ratio of the financially distressed firms in the Egyptian Stock Exchange. Earnings management regardless through accruals or real activities decreases the earnings quality in the firms which are likely prone to financial distress. The present study has several limits which creates avenues and opportunities for further research. It emphases on the impact of earnings quality throughout the period 2015-2019 from Egyptian context, and hence scrutinizing this effect in other periods, contexts, countries and regions can lead to further understanding of managers' perception and motivations towards financial distress determinants. Moreover, further research can examine the company specific characteristics as a moderating effect on the association between earnings quality and possibility of financial distress. In addition, further research can examine the social responsibility as a moderating influence on the linkage between earnings quality and the possibility of financial distress.

References:

Aboody, D., Hughes, J., & Liu, J. (2005). Earnings quality, insider trading, and cost of capital. *Journal of Accounting Research*, *43*(5), 651-673.

Aggarwal, R., Erel, I., Ferreira, M., & Matos, P. (2011). Does governance travel around the world? Evidence from institutional investors. *Journal of financial economics*, 100(1), 154-181.

Al-Hadi, A., Chatterjee, B., Yaftian, A., Taylor, G., & Monzur Hasan, M. (2019). Corporate social responsibility performance, financial distress and firm life cycle: evidence from Australia. *Accounting & Finance*, 59(2), 961-989.

Al-Hadi, A., B. Chatterjee, A. Yaftian, G. Taylor, and M. M. Hasan, 2017, Corporate social responsibility performance, financial distress and firm life cycle: evidence from Australia. Accounting *and Finance*, forthcoming.

Altman, E. I. (1968). Financial ratios, discriminant analysis and the prediction of corporate bankruptcy .*The journal of finance*. 23(4), 589-609.

Altman, E. I., Iwanicz-Drozdowska, M., Laitinen, E. K., & Suvas, A. (2017). Financial distress prediction in an international context: A review and empirical analysis of Altman's Z-score model. *Journal of International Financial Management & Accounting*, 28(2), 131-171.

Bhaskar, L. S., Krishnan, G. V., & Yu, W. (2017). Debt covenant violations, firm financial distress, and auditor actions. *Contemporary Accounting Research*, 34(1), 186-215.

Brown, L. D., & Sivakumar, K. (2001). *Comparing the quality of three earnings measures*. Unpublished working paper, Georgia State University.

Campbell, J. Y., Hilscher, J., & Szilagyi, J. (2008). In search of distress risk. *The Journal of Finance*, 63(6), 2899-2939.

Carmo, C. R., Moreira, J. A. C., & Miranda, M. C. S. (2016). Earnings quality and cost of debt: evidence from Portuguese private

companies. *Journal of Financial Reporting and Accounting*, 14 (2), 178-197.

Chambers, D. J. (2003). *Earnings Persistence and Accrual Anomaly.* Working Paper, University of Illinois at Urbana- Champaign, 1-29.

Chang, W. J., R. M. Hayes, and S. A. Hillegeist, 2016, Financial distress risk and new CEO compensation, *Management Science*, 62, 479–501.

Charitou, A., Lambertides, N., & Trigeorgis, L. (2011). Distress risk, growth and earnings quality. *Abacus*, 47(2), 158-181.

Dang, H. N., Pham, C. D., Nguyen, T. X., & Nguyen, H. T. T. (2020). Effects of corporate governance and earning quality on listed Vietnamese firm value. *The Journal of Asian Finance, Economics, and Business*, 7(4), 71-80.

Darrat, A. F., Gray, S., Park, J. C., & Wu, Y. (2016). Corporate governance and bankruptcy risk. *Journal of Accounting, Auditing & Finance*, 31(2), 163-202.

DeAngelo, H., & DeAngelo, L. (1990). Dividend policy and financial distress: An empirical investigation of troubled NYSE firms. *The Journal of Finance*, 45(5), 1415-1431.

DeAngelo, H., DeAngelo, L., & Skinner, D. J. (1994). Accounting choice in troubled companies. *Journal of accounting and economics*, 17(1-2), 113-143.

Dechow, P. M., & Dichev, I. D. (2002). The quality of accruals and earnings: The role of accrual estimation errors. *The Accounting Review*, 77(s-1), 35-59.

Dechow, P. M., Ge, W., & Schrand, C. (2010). Understanding earnings quality: A review of the proxies, their determinants and their consequences. *Journal of accounting and economics*, 50(2-3), 344-401.

Dechow, P., Ge, W., & Schrand, C. (2010). Understanding earnings quality: A review of the proxies, their determinants and their

consequences. *Journal of accounting and economics*, *50*(2-3), 344-401.

Dirman, A. (2020). Financial distress: The impact of institutional ownership, independent commissioners, managerial ownership and audit commeett. *International Journal of Management Studies and Social Science Research*, 2(4), 202-210

El-Deeb M., Ramadan, M. (2020). The Impact of Financial Distress, Firm Size, and Audit Quality on Earnings' Management Evidence from Companies listed in the Egyptian Stock Exchange. *Alexandria Journal of Accounting Research*, 4(11), 1-43.

Eliwa, Y., Haslam, J., & Abraham, S. (2016). The association between earnings quality and the cost of equity capital: Evidence from the UK. *International Review of Financial Analysis*, 48, 125-139.

Ezat, A. N. M. (2014). Corporate governance ownership structure and cost stickiness: Evidence from Egypt. *The Egyptian Journal For Commercial Studies*, Mansoura University, 38(4), 27-78.

Francis, J. R. LaFond, P. M. Olsson, and K. Schipper. (2003b). *Costs of Equity and Earnings Attributes*. Working Paper, Fuqua School of Business, Duke University 1-42.

Francis, J., R. LaFond, P. M. Olsson, and K. Schipper. (2004). Costs of Equity and Earnings Attributes. *The Accounting Review*, 79(4), 967-1010.

Francis, J., R. LaFond, P. Olsson, and K. Schipper. (2003a). *The Market Pricing of Earnings Quality*, Working Paper, Fuqua School of Business, Duke University, 1- 42.

Gberegbe, F. B. (2019). Book-Tax ratio and earnings quality of listed firms in Nigeria. *Journal of Modern Accounting and Auditing*, 15(5), 249-260.

Habib, A., Costa, M. D., Huang, H. J., Bhuiyan, M. B. U., & Sun, L. (2020). Determinants and consequences of financial distress: review of the empirical literature. *Accounting & Finance*, 60, 1023-1075.

Hoang, T. C., Abeysekera, I., & Ma, S. (2017). The effect of board diversity on earnings quality: An empirical study of listed firms in Vietnam. *Australian Accounting Review*, 27(2), 146-163.

Holder-Webb, L., & Cohen, J. R. (2007). The association between disclosure, distress, and failure. *Journal of Business Ethics*, 75(3), 301-314.

Hung, D. N., & Van, V. T. T. (2020). Studying the impacts of earnings quality on stock return: experiments in Vietnam. *International Journal of Advanced and Applied Sciences*, 7 (4), 45-53.

Hussain, A., Akbar, M., Kaleem Khan, M., Akbar, A., Panait, M., & Catalin Voica, M. (2020). When Does Earnings Management Matter? Evidence across the Corporate Life Cycle for Non-Financial Chinese Listed Companies. *Journal of Risk and Financial Management*, 13(12), 313.

Ibrahim, M. F., (2014). The relationship between the quality of profits and the company's potential exposure to the risks of financial default: An applied study on the Egyptian non-financial joint stock companies registered in the Egyptian stock market. *Journal of Accounting Thought*, Ain Shams University, Faculty of Commerce, Department of Accounting and Auditing, (18), 189-235.

Jacoby, G., Li, J & ,.Liu, M .(2019) .Financial distress, political affiliation and earnings management: the case of politically affiliated private firms. *The European Journal of Finance*, 25(6), 508-523.

Jaggi, B., & Lee, P. (2002). Earnings management response to debt covenant violations and debt restructuring. *Journal of Accounting, Auditing & Finance*, 17(4), 295-324.

Jiang, W., Lee, P., & Anandarajan, A. (2008). The association between corporate governance and earnings quality: Further evidence using the GOV-Score. *Advances in Accounting*, 24(2), 191-201.

Jones, J.J. (1991). Earnings Management During Important Relief Investigations. *Journal of Accounting Research*, 29, (2), 193-228.

Jostarndt, P., and Z. Sautner, 2008, Financial distress, corporate control, and management turnover, *Journal of Banking and Finance*, 32, 2188–2204.

Jubb, C. A., Houghton, K. A., & Butterworth, S. (1996). Audit fee determinants: the plural nature of risk. *Managerial Auditing Journal*. 11(3), 25-40.

Kallunki, J. P., & Pyykkö, E. (2013). Do defaulting CEOs and directors increase the likelihood of financial distress of the firm?. *Review of Accounting Studies*, 18(1), 228-260.

Kane, G. D., Velury, U., & Ruf, B. M. (2005). Employee relations and the likelihood of occurrence of corporate financial distress. *Journal of Business Finance & Accounting*, 32(5-6), 1083-1105.

Krishnan, G. V., & Zhang, J. (2019). Does mandatory adoption of IFRS enhance earnings quality? Evidence from closer to home. *The International Journal of Accounting*, 54(01), 1-42.

Lian, Y. (2017). Financial distress and customer-supplier relationships. *Journal of Corporate Finance*, 43, 397-406.

Lougee, B. A. and C. A. Marquardt. (2002). *Earnings Quality and Strategic Disclosure: An Empirical Examination of 'Pro Forma' Earnings*. Working Paper, University of California, 1-38.

Magee, S. (2013). The effect of foreign currency hedging on the probability of financial distress. *Accounting & Finance*, 53(4), 1107-1127.

Mehrani, S., Kamyabi, Y., & Ghayour, F. (2017). Reviewing the effectiveness of earnings quality indices on the power of financial distress prediction models. *Accounting and Auditing Review*, 24(1), 103-126.

Molina, C. A., & Preve, L. A. (2012). An empirical analysis of the effect of financial distress on trade credit. *Financial Management*, 41(1), 187-205.

Muljono, D. R., & Suk, K. S. (2018). Impacts of financial distress on real and accrual earnings management. *Jurnal Akuntansi*, 22(2), 222-238.

Nikoomaram, H., Fard, H. V., Roodposhti, F. R., Talebnia, G., & Amini, P. (2011). Conceptual model for relationship between earning quality and cost of capital. *African journal of business management*, 5(22), 9724-9733.

Nuris, D. M. R., & Juliardi, D. (2017). The Effect of Auditor Switch Toward the Firm Value And Earning Persistance.

Ogwoka, M. G., Mwau, M. J., & Rang'ala, L. L. (2020). Influence of Corporate Governance Practices on Financial Distress of Firms Listed at the Nairobi Securities Exchange, Kenya.

Ohlson, J. A. (1980). Financial ratios and the probabilistic prediction of bankruptcy. *Journal of Accounting Research*, 109-131.

Pagalung, G., & Sudibdyo, B. (2012). The determinant factors of earnings quality and economic consequences. *EKUITAS (Jurnal Ekonomi dan Keuangan)*, 16(1), 105-122.

Parker, S., Peters, G. F., & Turetsky, H. F. (2002). Corporate governance and corporate failure: a survival analysis. Corporate Governance: *The international journal of business in society*, 2(2), 4-12.

Pernamasari, R., S. Purwaningsih, T. Juita, & Dewi, R. (2019), Good Corporate Governance and prediction of financial distress to Stock Price: Atman Z Score Approach", University of Mercubuana, Indonesia, University of Muhammadiyah Jakarta, Indonesia, *International Journal of Economics and Management Studies* (SSRG-IJEMS). 6(11).

Perotti, P., & Wagenhofer, A. (2014). Earnings quality measures and excess returns. *Journal of business finance & accounting*, 41(5-6), 545-571.

Rakshit, D., & Paul, A. (2020). Earnings Management and Financial Distress: An Analysis of Indian Textile Companies. NMIMS *Journal of Economics and Public Policy*, 5(3), 40-53.

Ranjbar, S., & Amanollahi, G. (2018). The effect of financial distress on earnings management and unpredicted net earnings in companies listed on Tehran Stock Exchange. *Management Science Letters*, 8(9), 933-938.

Ranjbar, S., & Amanollahi, G. (2018). The effect of financial distress on earnings management and unpredicted net earnings in companies listed on Tehran Stock Exchange. *Management Science Letters*, 8(9), 933-938.

Raza, H., Gillani, S. M. A. H., Ramakrishnan, S., Gillani, S. M. A. H., & Imran, M. (2020). Non-systematic Review of Financial Sustainability and Financial Distress. International *Journal of Psychosocial Rehabilitation*, 24(06), 885-900.

Richardson, G., Taylor, G., & Lanis, R. (2015). The impact of financial distress on corporate tax avoidance spanning the global financial crisis: Evidence from Australia. *Economic Modelling*, 44, 44-53.

Saleh, I., ABU Afifa, M & Alsufy, F. (2020). Does Earnings Quality Affect Companies' Performance ?New Evidence from the Jordanian Market .*The Journal of Asian Finance, Economics, and Business*, 7(11), 33-43.

Schultz, E. L., Tan, D. T., & Walsh, K. D. (2017). Corporate governance and the probability of default. *Accounting & Finance*, 57, 235-253.

Simlai, P. (2014). Firm characteristics, distress risk and average stock returns. *Accounting Research Journal*, 27(2), 101-123.

Siyanbola, T. T., Ogbebor, P. I., Okeke, O. C., & Okunade, R. A. (2019). Corporate governance and reported earning quality in deposit money banks in Nigeria. International *Journal of Business and Management Review*, 7(5), 26-37.

Sun, H., Yuen, D. C., Zhang, J., & Zhang, X. (2020). Is knowledge powerful? Evidence from financial education and earnings quality. *Research in International Business and Finance*, 52, 1-20.

Tennyson, B. M., Ingram, R. W., & Dugan, M. T. (1990). Assessing the information content of narrative disclosures in explaining

bankruptcy. *Journal of Business Finance & Accounting*, 17(3), 391-410.

Theodossiou, P., Kahya, E., Saidi, R., & Philippatos, G. (1996). Financial distress and corporate acquisitions: Further empirical evidence. *Journal of Business Finance and Accounting*, 23(5-6), 699-719.

Tykvová, T., & Borell, M. (2012). Do private equity owners increase risk of financial distress and bankruptcy*?. Journal of Corporate Finance*, 18(1), 138-150.

Ul Hassan, E., Zainuddin, Z., & Nordin, S. (2017). A review of financial distress prediction models: logistic regression and multivariate discriminant analysis. *Indian-Pacific Journal of Accounting and Finance*, 1(3), 13-23.

Xu, Y., Carson, E., Fargher, N., & Jiang, L. (2013). Responses by Australian auditors to the global financial crisis. *Accounting & Finance*, 53(1), 301-338.

Zhang, W. (2015). R&D investment and distress risk. *Journal of Empirical Finance*, 32, 94-114.

Zmijewski, M. E. (1984). Methodological issues related to the estimation of financial distress prediction models. *Journal of Accounting research*, 59-82.

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تأثير جودة الأرباح على التعثر المالي للشركات: دليل تطبيقي من مصر

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الملخص:

الـــهدف: تبحث هذه الدراسة مدى تأثير جودة الأرباح على التعثر المالي للشركات المقيدة في البورصة المصرية.

التصميم /المنهجية/ المدخل: تختبر الدراسة عينة قوامها (٨٥) شركة مقيدة بالبورصة المصرية خلال الفترة من (٢٠١٥-٢٠١٩) باجمالى مشاهدات عددها (٤٢٥) مشاهدة، وقد تم قياس جودة الأرباح من خلال نموذج جودة الإستحقاقات، بينما تم قياس التعثر المالي من خلال نموذج Altman Z-Score ، وقد تم إستخدام تحليل الإنحدار والإرتباط وتحليل التمايز وتحليل الحساسية .

النتائج: أظهرت النتائج وجود علاقة قوية عكسية بين جودة الأرباح والتعثر المالي كما أكدت النتائج على وجود تأثير معنوى لجودة الأرباح على التعثر المالى للشركات محل الدراسة. بالإضافة لذلك كشفت النتائج عن وجود تأثير إيجابي قوي للرافعة المالية على التعثر المالي للشركات في البيئة المصرية، كما أظهرت النتائج وجود تمايز ذو دلالة معنوية بين الصناعات أو قطاعات الشركات المقيدة فى البورصة المصرية فيما يتعلق بكل من جودة الأرباح والتعثر المالي للشركات.

الأهمية العملية: تسلط النتائج الضوء على مساهمة جودة الأرباح في الحد من التعثر المالي داخل الأسواق الناشئة. كما أنها توفر معلومات علمية وعملية لمستخدمي التقارير المالية في عملية إتخاذ القرار الرشيدة لكل من حملة الأسهم وأصحاب المصالح والمستخدمين الداخليين والخارجيين للتقارير المالية.

الأصالة والإضافة العلمية: تقدم الدراسة أدلة تجريبية تتعلق بعواقب جودة الأرباح الناتجة عن التعثر المالي مستنبطة من البيئة المصرية.

الكلمات الدالة: جودة الأرباح، مؤشر (Z-Score) Altman، التعثر المالي.