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Capital Structure and Firm Performance: Empirical Evidence from a Transition Country

Abstract

The purpose of this paper is to investigate the effect of capital structure on the financial performance of non-financial firms in Egypt. A panel econometric technique namely fixed effects model is employed based on the result of the hausman test to estimate the impact of capital structure indicators which are long-term debt LDR and short-term debt SDR on firm performance proxies such as returns on asset (ROA), returns on equity (ROE) and Tobin-Q. The main control variables used in the current study are firm size, firm age, assets tangibility and growth of sales. All tests in this study are applied on data obtained from annual financial reports of the 50 most active companies in the Egyptian stock market during the period 2003 to 2015.

The statistical results show that there is a significant negative effect of long-term debt LDR and short-term debt SDR on the ROA. On the contrary, there is a positive significant effect of short-term debt SDR on the Q ratio, while the effect of long-term debt LDR on the Q ratio is insignificant. However, there is an insignificant effect of long-term debt LDR and short-term debt SDR on the ROE.

Keywords: capital structure, financial performance, fixed effects.

ملخص البحث

وتؤثر هيكل رأس المال والأداء المالي للشركات على مختلف جوانب بقاء الشركة. الغرض من هذه االدراسة التحقيق في لتأثير هيكل رأس المال على الأداء المالي للشركات غير المالية في مصر. يتم استخدام تقنية A panel econometric technique وهي نموذج الآثار الثابتة استنادًا إلى نتيجة اختبار hausman لتقدير تأثير مؤشرات هيكل رأس المال التي هي الديون طويلة الأجل LDR والديون قصيرة الأجل SDR على أداء الشركات مثل العائد على الأصول (ROA)، والعائد على حقوق الملكية (ROE) و Tobin–Q والمتغيرات الرئيسية المستخدمة في الدراسة الحالية هي حجم الشركة، وعمر الشركة، وقابلية الأصول الوجود المادى للاصول، ونمو المبيعات. تم تطبيق جميع الاختبارات في هذه الدراسة على البيانات من التقارير المالية السنوية لأكثر ٥٠ شركة الأكثر نشاطاً في سوق الأوراق المالية المصرية خلال الفترة من ٢٠٠٣ إلى ٢٠١٥.

وتبين النتائج الإحصائية أن هناك أثراً سلبياً كبيراً للديون الطويلة الأجل والديون القصيرة الأجل على العائد على الأصول. وعلى العكس من ذلك، هناك أثر إيجابي كبير للديون القصيرة الأجل على Q ratio ، في حين لا تأثير للدين الطويل الأجل على نسبة الـ Q ratio . ومع ذلك، هناك لا تأثير لكلا من الديون طويلة الأجل LDR والديون القصيرة الأجل على حقوق الملكية .

الكلمات المفتاحية: هيكل رأس المال، الأداء المالي، الآثار الثابتة.

1- Introduction

Ever since the publication of the study of Modigliani and Miller (1958), the theory of capital structure and its association with firm performance and value remained a vital issue in corporate finance literature (Dawar, 2014). Capital structure is the mean for a company to finance its assets through the assortment of equity and or debt (Chechet and Olayiwola, 2014). Moreover, the capital structure and the ability of firms to fulfill the needs of various stakeholders are strongly related. (Madubuko, 2016).

The corporate finance studies have triggered the attention of several researchers to investigate the influence of capital structure mixture on performance. The main challenge facing companies is determining the components of capital and their impact on performance, whereas, the critical issue facing the firm is that the value of the firm and its survival are strongly related to the performance of the business. Capital structure is closely related to the financial performance (Zeitun and Tian, 2007). Moreover, the capital structure decisions is subject to management discretion, for this reason the capital structure employed may not serve the goal of the firm value maximization but for the manager's interest protection (Dimitris, and Psillaki, 2010).

In both developed and developing countries, the issue of financial constraints has been an ongoing argument influencing corporate performance of the firms especially in developing countries such as Egypt (Ebaid, 2009). In developed markets, there are numerous studies investigated the effect of capital structure on financial performance such as USA and Europe, but a few studies were applied in emerging markets such as Egypt about such implications.

Egypt is a unique case for two reasons as argued by Eldomiaty (2007), although Egypt has gone through economic system transition into capitalism and open market, still the managerial decision making is constrained by government supporting the high level of financial leverage, especially, those firms gone through the privatization policy adopted by Egyptian government by

the mid–1990s. Additionally, the capital market in developing country is less efficient and suffers from information asymmetry compared to those in developed countries. This may lead to adversely affect financing decisions to be irregular. Thus, it is crucial to investigate the corporate leverage impact on a firm's performance in Egypt these unique economic settings to provide insight into this relationship (Ebaid, 2009). Consequently, it is imperative to reflect that there is no single theory that can fully interpret the effect of capital structure on firm performance. Specifically, within different contexts the effect of capital structure on firm value could considerably vary, thus the traditional capital structure theories applied in developed countries could become questionable under different conditions.

The interplay of debt and equity and firm performance has been the subject of numerous studies. The primary objective of this paper is to provide additional evidence regarding the impact of the two key measures of capital structure such as long and short–term debt ratio influence the performance of Egyptian firms. Moreover, this study provides additional evidence for examining the reliability of financial theories in clarifying the effect of capital structure on firm performance in a transition and developing country like Egypt. Based on data availability, three performance measures such as return on assets and return on equity (accounting–based) and market–to–book ratio (market–based) were used as dependent variables in this study.

2- Overview of research context: Egypt

Egypt has one of the oldest stock markets, which dates back insofar as 1881. In the late 1950s, during the nationalization process the market declined dramatically. In the 1991, Egypt followed a well–tailored economic reform program, which dramatically changed Egypt economic environment following objectives set by the International Monetary Fund (Omran and Pointon, 2009).

Early 2004, major structural reforms were applied, such as a comprehensive renovation of the tax system, trade liberalization and privatization of

some State-owned Enterprises (SOEs) and banks. The Egyptian financial market is controlled by the banking sector which in return underwent main reforms to protect Egypt from severe drawbacks of the global financial crisis of 2008-2009 (Herrera and Youssef, 2013).

However, during the period 2008 to 2011, Egypt endured significant shocks, both global and country-specific. In 2008, Egypt was shocked by the global crisis, which resulted in a slowdown, stagnation in employment growth, and high inflation due to rising food prices. In 2010, the GDP grew above 5%. Nevertheless, as the country recovered from that shock the 2011 revolution threw the Egyptian economy into a plunge. The Egyptian economy has undergone a prolonged transition to a new political regime, forced the economy into a pause and compounded uncertainty. Several researchers argued that the capital structure are affected by different jurisdictional factors such as and laws and regulations of the country; in that sense it is crucial to consider each developing country by its own characteristics rather than generalizing to all countries (Alves and Miguel, 2007).

3-Literature Review and the Hypothesis
3-1 Theories of Capital Structure

One of the most prevalent issue in the era of corporate finance is profitability. Another, critical decision facing any enterprise is the successful selection of capital structure which directly affects the firm's profitability (Kajananthan, 2012). For business survival, profitability must be re-invested into the business (Velnampy, 2005). On the other hand, too much attention paid to profitability may lead the firm into a pitfall. It will cause firms to dilute its liquidity position (Ross et al, 2008; Bodie et al 2009).

In general, the capital structure of the firm illuminated by several dominant theories, which illustrated the relevance of capital structure: Modigiliani-Miller Theory, Trade off Theory, Pecking order Theory and Agency Costs Theory.

According to Modigliani and Miller (MM) (1958), the basis for modern thinking on capital structure, the theory was initially proven under many critical assumptions such as no taxes, a certain market price process, bankruptcy costs, asymmetric information, and under an efficient market, the value of a firm is not a matter of the firm's capital sources financed through issuing stock and or selling debt, this theory is as well known for "the capital structure irrelevance principle" (Booth et al, 2001).

The second theory is the trade-off theory which refers to the multiple corporate combination of the two components of capital structure equity and debt. Mainly, the cost of finance distress and agency cost concepts are dealt with under this theory (Nirajini and Priya, 2013).

The different benefits and costs associated with debt financing could be illustrated by the optimal capital structure; debt benefits include tax shields (saving), reduced agency costs due to the threat of take-over, and the urge to pay interest payment through generated cash flow (Akintoye, 2009). The high leverage result in both mitigating the shareholders and managers conflict of interest, and an enhanced firm's performance.

Conversely, debt financing could increase the firm's liquidity risk as a result of both commitment for payment of periodic interest and the principal borrowed. Nevertheless, previous researches proposed that bankruptcy costs are smaller in comparison to tax saving associated with debt (Ebaid, 2009).

The third theory of capital structure is the pecking order theory developed by Myers (1984), Myers and Majluf (1984). This theory does not consider an optimal capital structure as a starting point; rather internal financing is preferred over external financing; however, the market may underestimate a firm's new issue of shares value relative to the value assessed by managers due to information irregularity between both investors and managers about the potential firm's investment opportunities (Le and Phan, 2017).

In addition to the above, the fourth theory of capital structure is Agency Costs theory. The theory discusses that managers will maximize their own wealth, Jensen & Meckling, (1976). One of the determinants of the top manager's compensation is a stable cash flow. Therefore, a manager maybe inclined to achieve a stable cash flow through the control of systematic risk over time rather than an increased cash flow with greater variability. Furthermore, the stabilization of cash flows grants the assurance to maintain the managers in their positions; which still encourage the manager to pursue control of the systematic risk of the enterprise (Ahmed and Wang, 2013).

As the theories are mixed and contradicting, the firm's financing decisions affected by several factors, therefore, depending on one theory will not provide a complete analysis of that decision (Myers, 2001; Eldomiaty, 2007). Furthermore, all these theories have several critical assumptions, whereas the real society is multifaceted and diversified (Ardalan, 2017).

In corporate finance and accounting literature, the capital structure and its impact on the firm's performance has been a puzzling issue, yet very crucial for several reasons (Kinsman and Newman, 1999). Among these reasons: first, the average debt level of the firm has increased significantly over the previous periods, the investigation of the impact of debt level on firm's performance is required to reach an appropriate debt level decision. Second, as of the conflict of interest between managers and investors, the relative emphasis of any effects of debt on firm's performance must be identified. Third and most vital reason is to investigate the relationship between debt level and shareholder's wealth, since the main goal of firm's managers is to maximize the market value of the shareholder's wealth.

3-2 Capital Structure

The capital structure refers to the specific mix of debt and equity the firm uses in financing their operations. In corporate finance, the most important concern is to determine about the mixture of capital structure to finance their investments and operations that will maximize the value of the firm. This is

the capital structure problem. Capital structure is considered as one of the main factors that has an impact on firm performance (Woldemariam, 2016).

3-3 Financial Performance

Financial performance is the firm's level of profitability as measured by different financial ratios. Using one factor would not reflect every side of a firm performance hence, using several factors allow for a better evaluation of the financial performance of firms (Elvin and Abdul Hamid, 2016). The useful financial performance ratios in the literature include return on asset (ROA); return on equity (ROE) (Zouari and Taktak, 2014), Tobin's Q was used as a market performance measure in many studies (Ahmed and Wang, 2013; Bhayani and Ajmera, 2018; Sadeghian et al., 2012; Lin and Chang, 2011).

3-4 Capital Structure and Firm Performance

The literature on the relationship between capital structure and firm performance is enormous and mainly conducted in the developed countries. The empirical researches illustrated opposing and inconsistent results (Berger and Bonaccorsi di Patti, 2006; Chathoth and Olsen, 2007; Margaritis and Psillaki, 2010; Phillips and Sipahioglu, 2004; Singh and Faircloth, 2005). On the other hand, there are few studies conducted in the developing countries to investigate the relationship between capital structure and performance (Abor, 2007; Ebid, 2009; Kyerboah–Coleman, 2007; Lin and Chang, 2011).

Recently, in the developing and transition countries the capital structure and the firm performance has become a research topic. The previous studies have examined the relationship between capital structure mix as an independent variable and specific corporate characteristics as dependent variables (Shaker and Hassan, 2015).

In 2014, Empirical study applied in Indian firms to investigate the influence of the capital structure on the accounting performance (ROA and ROE), showed that a negative impact between the above mentioned variables (Dawar, 2014).

A study was conducted in Pakistan to investigate the impact of capital structure on performance during 2004–2009. The results showed that an inverse relationship between the debt ratios and return on assets (ROA). In addition, the researchers found a negative relationship between both variables total debt ratio, long-term debt ratio and Tobin's Q. Furthermore, there is a positive insignificant relationship between Short-term and Tobin's Q (Ahmed and Wang, 2013).

In addition to the above, another study in Tehran context using both accounting (ROA, ROE) and market measures (Tobin's Q) examined the impact of previous mentioned measures on capital structure, the researchers found an indirect relationship between capital structure and firm's financial performance (Sadeghian et al., 2012).

In Nigeria, other researchers study the effect of capital structure on firm's financial performance measured by ROA and ROE using sample of 30 firms. The results found a negative impact on firm's profitability (Onaolapo and Kajola, 2010).

Additionally, a study conducted in Ghana and South Africa studying a sample of small and medium-sized enterprises showed that long-term and short-term debt are negatively related with both variables return on assets (ROA) and Tobin's Q (Abor, 2007).

Moreover, studying the impact of accounting and market measures of performance on capital structure in 167 Jordanian companies over fifteen-year period (1989 – 2003), the results indicated that there is an inverse relationship between capital structure and firm performance (Zeitun and Tian, 2007).

Conversely, a research applied using accounting measures of financial performance on a sample of Egyptian listed firms during the period (1997–2005). The research results showed that there is insignificant relationship between capital structure and return on equity. There is also insignificant relationship with gross profit margin (Ebaid, 2009).

Another study was conducted to examine the effect of capital structure decision on the performance of firms listed on the Karachi Stock Exchange (the engineering sector) for the duration of 2003–2009 in Pakistan. The results demonstrate that capital structure measured by short–term debt and total debt has insignificant relationship with firm performance measured by the return on equity. Nevertheless, the results showed a significant inverse relationship with the firm performance. In the study, firm performance was measured by Return on Assets, Gross Profit Margin and Tobin's Q (Khan, 2012).

Conversely, some studies showed a positive relationship between capital structure and performance. In the Ghanian firms during the period 1998–2002, the research reported a positive relation between capital structure and performance (Abor, 2005).

In Iranian listed firms (from 2001 to 2007) indicated that there is a positive relationship between short–term and total debts with profitability (ROE) (Arbiyan and Safari, 2009). In addition, other studies confirm a positive relationship was between capital structure and firm performance (Eldomiaty and Azim, 2008; Hadlock and James, 2002).

Moreover, in Palestine stock exchange during the period 2006–2010, 28 companies were selected to investigate the effect of capital structure on firm performance. The result showed a positive relation between previous mentioned variables (Aburub, 2012).

In addition, another study examined 272 firms listed on New York Stock Exchange during (2005–2007). The results revealed a positive relationship between debt to total assets in the short–run, long–term debt to total assets, and total debt to total assets and profitability in the manufacturing industry (Gill, et al., 2011).

Furthermore, a study applied in Malaysia for the period from 1997 to 2008 on publicly listed government–linked companies and non–government–linked companies. The results revealed a negative relationship between debt

ratio and profitability for both government–linked and nongovernment–linked companies (Ting and Lean, 2011).

The following hypotheses are formulated:
H1:– There is a significant relationship between long–term debt and financial performance variables (ROE, ROA and Tobin's Q).
H2:– There is a significant relationship between short–term debt and financial performance variables (ROE, ROA and Tobin's Q).

4- **Research methodology**
4-1 Sample and data

This research studies the effect of capital structure on the financial performance in Egypt amongst the top 50 most active traded companies listed in the Egyptian Stock Exchange (ESE) during the period of 2003–2015. The data have been collected from the annual reports and the market data of the top 50 companies over a period of thirteen years (2003 to 2015).

4-2 Variables measurement

The main objective of this study is to empirically present an evidence of the effect of capital structure on financial performance. In order to achieve this; the model proposes an estimation that uses different measures of performance as dependent variables and capital structure as the independent variable this study applies different control variables.

In this study, the dependent variable is the firm performance, which include, accounting based ratios such as return on assets (ROA), return on equity (ROE) and Tobin's q ($QRatio$) applied to measures the Market–to–book value (Abor, 2005; Ebaid, 2009; Sadeghian et al., 2012; Abor, 2007; Zeitun and Tian, 2007). Moreover, the independent variable is capital Structure. Two ratios were applied short–term debt (SDR) and long–term debt (LDR) to evaluate financial leverage (Abor, 2005; Abor, 2007).

In addition to the above-mentioned variables, this study included some control variables such as firm size (*Size*), firm age (*Age)*, asset tangibility (*ATNG*), and growth (*Grow*). The firm size is measured by the log of the firm's total assets (Rajan and Zingales, 1995; Frank and Goyal, 2009; Ebaid, 2009) Several research found that size and firm leverage are positively related (Deesomsak et al., 2004; Rajan and Zingales,1995). On the other hand, other studies found that that size and firm leverage are negatively related (Chen, 2004; Ooi, 1999).

Moreover, Firm age is measured by the logarithm of the number of years between the firm observation year and firm establishment year. The previous studies showed that as a result of the experience-based economies, the older firms avoid the liabilities rather than the newness. Another research indicated that the firm age is positively related to long-term debt, but negatively related to short-term debt (Hall et al, 2004). Conversely, other studies exhibited a negative relationship to both short term and long-term debt and the firm age (Esperanca et al, 2003).

Assets tangibility calculated by the ratio of net fixed assets to total assets. The asset tangibility of a firm plays an important role in determining the firm's capital structure. Previous studies revealed that tangibility have contradictory effects on profitability. Some studies indicated that there is a positive relation-ship between asset tangibility and leverage (long term debt) for the firms (Es-peranca et al, 2003). On the other hand, other studies showed that there is a negative relationship between assets tangibility and profitability (Zeitun and Tian, 2007; Weill, 2008, Nunes et al., 2009).

Growth of sales, measured as rate of change in sales between the observa-tion year and the preceding years, some studies found that there is a positive relationship between sales growth and firm financial performance (Margaritis and Psillaki, 2010; Nunes et al., 2009; King and Santor, 2008; Zeitun and Tian, 2007; Brush et al., 2000; Gleason et al., 2000).

Marsh (1982) explained that firms with high growth would capture relatively higher debt ratios. Higher growth firms require more external financing and higher leverage. These firms will have a smaller proportion of debt in their capital structure. On the other hand, with small firms, there should be concentrated ownership (Heshmati, 2002).

This paper uses panel data since the data includes 50 firms over the sample period 2003–2015. There are two approaches used to analyze panel data, which are fixed effects model and random effects model. The Hausman test is performed to determine whether to use fixed or random effects. The results of the Hausman test assesses whether the random effects are uncorrelated with the explanatory variables, and strongly rejected. The outcome of this test suggest that the fixed effects model is more appropriate.

After going through the literature review, financial performance of firm's indicators, ROE, ROA, and Q ratio are being termed as dependent variables and capital Structure as the independent variable for the research model. Moreover, this study applied different control variables, which are, firm size, firm age, asset tangibility, growth of sales. The Relationship among leverage and performance was investigated by the following regression model.

$$ROE_{it} = \alpha_{it} + \beta_1 LDR_{it} + \beta_2 SDR_{it} + \beta_3 Size_{it} + \beta_4 Age_{it} + \beta_5 ATNG_{it} + \beta_6 Grow_{it} + \varepsilon_{it}$$

(1)

$$ROA_{it} = \alpha_{it} + \beta_1 LDR_{it} + \beta_2 SDR_{it} + \beta_3 Size_{it} + \beta_4 Age_{it} + \beta_5 ATNG_{it} + \beta_6 Grow_{it} + \varepsilon_{it}$$

(2)

$$QRatio_{it} = \alpha_{it} + \beta_1 LDR_{it} + \beta_2 SDR_{it} + \beta_3 Size_{it} + \beta_4 Age_{it} + \beta_5 ATNG_{it} + \beta_6 Grow_{it} + \varepsilon_{it}$$

(3)

Table 1 Variables used in this study.

Variable	Definition
Dependent variables	
Return on assets (ROA)	Ratio of net profit to total assets
Return on equity (ROE)	Ratio of net profit to total equity
Market–to–book value (Tobin's q)	the market value of equity plus the market value of debt divided by the replacement cost of all assets.
Independent variables	
Long–term debt (LDR)	Ratio of long–term debt to total assets
Short–term debt (SDR)	Ratio of short–term debt to total assets
Control variables	
Firm size (Size)	Natural logarithm of total assets
Firm age (Age)	Number of years since inception to the date of observation
Asset tangibility (ATNG)	Ratio of net fixed assets to total assets
Growth of sales (Grow)	$sales_{it} - sales_{i(t-1)}/sales_{i(t-1)}$

5- Results and Findings

This section outlines the empirical part and displays the results obtained from the analysis conducted using the research variables as mentioned in the literature review.

Table 2 presents the summary statistics of the variables used in the analysis, including the means, maximum, minimum and standard deviations. It was found that LDR ranges from 0 to 2.107109 with a mean value of 0.1369155. Similarly, SDR mean value is 0.3592723 on average, which means that the proportion of total assets financed with long and short–term debt is 13.7 and 35.9 percent, respectively. Furthermore, the greater dependence of Egyptian firms on short–term debt is consisted with the results of research applied in developing countries demonstrating that firms have substantially lower amounts of long–term debt (Demirguc–Kunt and Maksimovic, 1999). Accordingly, this could significantly affect the Egyptian firm's performance relying on short–term financing to a higher liquidity and refinancing risks.

In addition to the above, Size, Age, ATNG and Grow control variables mean values are 5.946355, .3661918, .3661918 and 1.590514 respectively. Furthermore, regarding the firm performance proxies presented by ROA, ROE and Tobin Q in Table 2, the average values of Q Ratio a proxy for market performance is 1.729324 ranges from .2346083 to 17.73243. The mean returns on assets and equity for the whole sample are 6.3% and 13.9% respectively. The ROA of the firms listed in the Egyptian stock exchange varies from –.5689297 to .4042084 and the ROE varies from –1.034063 to 1.237697, which demonstrates a great spread in their value. Consequently, these wide ranges indicate that during this period, a significant gap exist in the firm performance among Egyptian firms.

Table 2: Descriptive Analysis

	Mean	**Std. Deviation**	**Minimum**	**Maximum**
LDR	.1369155	.2118581	0	2.107109
SDR	.3592723	.2469617	.0060314	2.307861
Size	5.946355	.7478703	3.988068	7.977504
Age	1.445026	.3264355	.60206	2.206826
ATNG	.3661918	.3158491	.0007554	3.246601
GROW	1.590514	21.65185	–1	472.5
ROE	.1392184	.2073185	–1.034063	1.237697
ROA	.0632724	.1092341	–.5689297	.4042084
Q ratio	1.729324	1.430725	.2346083	17.73243

5-1 Testing the Effect of the Research Variables on ROA, RE, and Q Ratio

Generally, pooled OLS, FE and RE estimation techniques are applied to estimate panel data. In this sub section, to conclude which model is appropriate, an F–test for the FE model, the Breusch–Pagan Lagrange Multiplier (LM) test for RE and the Hausman test for both fixed and random effects models were conducted. As shown in table 3, the appropriate models for this study are selected based the results of the previously mentioned tests.

Moreover, to ensure the validity of the inferences obtained from the tests employed in this study, tests for group-wise heteroskedasticity, using the Wald test, and for autocorrelation, using the Wooldridge test, were performed. The results of these tests prove the existence of heteroskedasticity and autocorrelation problems. Thus, all the t-tests reported in this study are calculated using Heteroskedasticity and Autocorrelation Consistent (HAC) standard errors.

Table 3 Tests and models used in this study

F-test	Breusch-Pagan Test	Hausman test	The model is chosen	Results
Ho is not rejected			Pool OLS	ROE F test = 6.59 (0.000)
Ho is rejected			Fixed effect model	ROA F test = 14.81 (0.000) Q Ratio F test = 12.14 (0.000)
	Ho is not rejected		Pool OLS	ROE chi bar2 = 244.32 (0.000) ROA chi bar2 = 741.96 (0.000)
	Ho is rejected		Random effect model	Q Ratio chi bar2 = 243.81 (0.000)
		Ho is not rejected	Random effect model	ROE chi2 = 63.39 (0.000)
		Ho is rejected	Fixed effect model	ROA chi2 = 40.51 (0.000) Q Ratio chi2 = 10.95 (0.089)

5-2 Testing the Effect on ROE

Table 4 shows the results of the fixed effects model that test the relationship between the ROE and capital structure ratio. LDR, SDR, Size, Age, ATNG, Grow on ROE. It illustrates that there is a significant positive effect of Grow on the ROE at the 1% level, as the regression coefficient is.0006302. Also, there is an insignificant effect of LDR, SDR, Size, Age and ATNG on ROE. Therefore, both hypotheses that short-term and long-term debts have a significant relation with firm performance (ROE) are rejected.

The insignificant relationship between Long term, Short- term and firm performance (ROE) had been supported by previous studies which showed an insignificant effect of capital structure on ROE (Abdul Ghafoor, 2012; Ebaid, 2009). Moreover, another study showed an insignificant relationship of SDR with ROE in the emerging market economies (Bokpin, 2009). On the other hand, other studies found that there is a significant negative relationship (Dawar, 2014; Sadeghian et al., 2012; Ting and Lean, 2011; Onaolapo and Kajola, 2010; Zeitun and Tian, 2007). Moreover, there is a positive relationship between total debts with profitability (ROE) (Aburub, 2012; Gill, et al., 2011; Arbiyan and Safari, 2009; Abor, 2005; Eldomiaty and Azim, 2008; Hadlock and James, 2002).

5-3 Testing the Effect on ROA

Table 4 also presents the results of the fixed effects model that tests the relationship between the ROA and the capital structure ratio. Unlike the ROE, there is a strongly significant negative relationship between the ROA and long- and short-term debt ratios at the 1% level. Therefore, both LDR and SDR have a negative impact on the ROA which implies that long-term and short- term debt financing decrease the firm's performance. This inverse relationship is clarified by the higher cost of debt and strong covenants associated with the use of debt (Ebaid, 2009; Bokpin and Arko 2010; Ahmed and Wang, 2013). This may be due to the undervaluing of bankruptcy costs of liquidation or reorganization which lead firms to borrow more than the appropriate level;

consequently, result in an inverse relationship between debt ratio and firm performance (ROA) (Milton and Raviv, 1991). Additionally, large cash flow resulting from debt could induce managers to pursue discretionary behavior, hence negatively impact the firm's performance (ROA) ((Le and Phan, 2017). As a result, both hypotheses that short-term and long-term debts have a significant relation with firm performance (ROA) are accepted.

Conversely, similar to the ROE, there is a significant positive relationship between the ROA and the Growth. Overall, the results of the ROA show that there is a significant relation between capital structure and firms' financial performance. Moreover, the R squared is 0.1287, which means that 12.8% of the variation in the ROA can be explained by the LDR, SDR and Grow. Therefore, the results of this study are consistent with previous studies (Dawar, 2014; Ahmed and Wang, 2013; Sadeghian et al., 2012; Ting and Lean, 2011; Onaolapo and Kajola, 2010; Abor, 2007; Zeitun and Tian, 2007). On the other hand, other studies revealed that there is insignificant relationship between Long term, short term and firm performance (ROA) had been supported by the previous studies (Ebaid, 2009; Bhayani and Ajmera, 2018). Moreover, additional researches showed that there is a positive relationship between capital structure with profitability (ROA) (Aburub, 2012; Gill, et al., 2011; Abor, 2005; Eldomiaty and Azim, 2008; Hadlock and James, 2002).

5-4 Testing the Whole Model for the Effect on Q Ratio

Table 4 illustrates the results of the fixed effects model that tests the relationship between the Q Ratio and the capital structure ratio. There is a strongly significant positive relationship between the Q Ratio and short-term debt ratio and Grow at the 5% level and 1% respectively. Interestingly, the positive significant relationship between SDR and Q Ratio shows that the higher the SDR in the capital structure the higher Tobin's Q ratio. While, there is a significant negative effect of Size on Q Ratio. Moreover, the R squared is 0.1002, which means that 10% of the variation in the Q Ratio can

be explained by the SDR, Size and Grow. This result had been supported by the previous study (Lin and Chang, 2011). On the other hand, other studies found that there is a significant negative relationship (Sadeghian et al., 2012; Abor, 2007; Joshua, 2007). In addition, other studies showed that an insignificant relationship between Long term, short term and firm performance (Q Ratio) (Ahmed and Wang, 2013; Bhayani and Ajmera, 2018).

Consequently, the first hypothesis that long–term debt has a significant relation with firm performance (Q Ratio) is rejected. While the second hypothesis, that the short–term debt has a significant relation with firm performance (Q Ratio) is accepted.

Table 4: Regression Model Fitted for Research Variables Effect on ROA, ROE, and Q Ratio

Variable	ROE			ROA			Q Ratio		
	Coefficient	t–stat	Sig	Coefficient	t–stat	Sig	Coefficient	t–stat	Sig
Constant	.7739419	1.72	0.092	.4440497	2.59	0.013	5.997404	3.71	0.001
LDR	-.090227	-1.30	0.198	-.1065879	-3.12	0.003	2.19907	1.54	0.129
SDR	.1244597	1.56	0.125	-.1289433	-3.24	0.002	.811908	2.18	0.034
Size	-.0530678	-0.58	0.568	-.0250315	-0.73	0.471	-.7373294	-2.19	0.034
Age	-.228432	-1.27	0.210	-.1172754	-1.58	0.120	-.2622302	-0.35	0.727
ATNG	-.0678003	-0.95	0.346	-.0084013	-0.14	0.888	-.3171784	-0.61	0.545
GROW	.0006302	3.96	0.000	.0001413	3.05	0.004	.0019981	3.19	0.003
R^2	0.0013			.128			0.1002		

6- Conclusions

One of the vital financial decisions facing the firms is the capital structure choice, since this decision will affect the value of the firm. The aim of this paper is to investigate the effect of capital structure on the financial performance of Egyptian listed firms during the period 2003 to 2015.

The result of the research can be useful to Egyptian managers and users who are concerned about high quality financial reports and performance of capital structure, moreover the result may greatly influence the decision-making process of businesses and government officials in setting policies for Egyptian companies. The finding can assist Egyptian managers to avoid a higher debt level proportion in their capital structure than appropriate levels.

The capital structure has significant effects on firm performance as designated by empirical results. Before altering the debt levels, the corporate managers should reflect the effect of leverage on firm performance. Moreover, the investors and the lenders should take into consideration the firm's debt level before making decisions. The overleveraging may increase the power of lenders, which in turn affects the firm's performance negatively. Additionally, when setting the debt covenants, lenders should kindly consider their effect on the firm's performance.

The empirical results show that the capital structure impacts negatively the firm's performance measured by ROA. On the other hand, capital structure (SDR and LDR) has no significant impact on firm's performance measured by ROE. Moreover, the results illustrate a negative relationship between capital structure (SDR and LDR) and ROA, which indicate that higher level of leverage lead to lower firm performance (ROA). Finally, the results demonstrate a significant positive relationship between capital structure (especially SDR) and the firm's performance measured by Q Ratio.

The insignificant relationship between all the capital structure variables in this research and ROE implies that shareholders who are concerned with ROE should be indifferent to any level of debt pursued by the firms as the level of debt in the firm's capital structure does not affect the firm' ROE.

The resulted negative relationship between capital structure (SDR and LDR) and firm performance (ROA) may be due to Egypt being considered as a transitional and emerging market. In the 1991 Egypt well-tailored economic reform program was initiated, which dramatically changed Egypt's eco-

nomic environment following objectives set by the International Monetary Fund (Omran and Pointon, 2009). Beginning fiscal year 2004, major structural reforms were applied, such as a comprehensive renovation of the tax system, trade liberalization and privatization of some State-owned Enterprises (SOEs) and banks (Herrera and Youssef, 2013). The Egyptian financial market is controlled by the banking sector which in return underwent main reforms to protect Egypt from severe drawbacks of the global financial crisis of 2008-2009. It was contended that state-owned financial institutions are not influenced by wrong loan decisions made by their principals as privately owned companies are, because their owner, the government, hypothetically constantly has deep pockets (Majumdar and Chhibber, 1999). Hence, due to the debt monitoring inefficiency managers may increase the use of debt to undertake discretionary investments, which inversely impact firm performance (Le and Phan, 2017).

As far as control variables, the study showed evidence that there is a significant positive relationship between Grow and ROA, ROE and Q Ratio as measures of performance. This result indicates that Growth of sales is one of the major determining factors of firm's performance in the three proxies. The positive relationship between Grow and Grow and ROA, ROE and Q Ratio indicates that firms with a high growth rate are able to create more value and profit from current investment opportunities.

On the other hand, the results showed that firm size has negative relationship with firm performance measured by Q Ratio, and no significant relationship with firm performance measured by ROA and ROE. Moreover, this study shows an insignificant relationship between firm size, age and ATNG with ROA and ROE. Thus, this indicates that the internal firm characteristic factor of Egyptian listed companies does not influence the Egyptian firm's performance. Consequently, in this case, the results indicate that the firm's characteristics such as size, age and ATNG have no role in the investors choice.

7- Limitations and Future Research

There are few limitations of this research. Firstly, the study was applied on one emerging market; therefore, the results may not be generalized to all emerging markets, as each emerging market may be subject to different characteristics, rule and regulations. Second major limitation of this research the size of the sample was conducted on the listed company in the stock exchange; a more consistent result may be calculated by using other companies rather than only listed companies.

For further research could investigate the impact of both capital structure and ownership structure on firm's performance, also other control variables could be included business risk, tax, liquidity and the annual inflation rate.

References

Abdul Ghafoor, K. (2012). The relationship of capital structure decisions with firm performance, a study of the engineering sector of Pakistan. *International Journal of Accounting and Financial Reporting,* 2(1), 245–262.

Abor, J. (2007). Debt policy and performance of SMEs: evidence from Ghanaian and South Africa firms. *Journal of Risk Finance*, 8(4), 364–379.

Abor, J. (2005). The effect of capital structure on profitability: an empirical analysis of listed firms in Ghana. *Journal of Risk Finance*, 6(5), 438–447.

Aburub, N. (2012). Capital structure and firm performance: evidence from Palestine stock exchange. *Journal of money, investment and banking*, 23, 109–117.

Ahmed, N. and Wang, Z. (2013). The impact of capital structure on performance: An empirical study of non–financial listed firms in Pakistan International. *Journal of Commerce and Management,* 23(4), 354–368.

Akintoye, I. (2009). Sensitivity of Performance to Capital Structure, Banking and Finance Letters, 1(1), 29–35.

Aleves, P. and Miguel, A. (2007). Capital Structure and Law around the World. *14th Annual Conference of the Multinational Finance Society.*

Ardalan, K. (2017). Capital structure theory: reconsidered. *Research in International Business and Finance*, 39 (B), 696–710.

Arbabiyan, A. and Safari, M. (2009). The effects of capital structure and profitability in the listed firms in Tehran Stock Exchange. *Journal of Management Perspective,* 33, 159–175.

Berger, A. and Bonaccorsi di Patti, E. (2006). Capital structure and firm performance: a new approach to testing agency theory and an application to banking industry. *Journal of Banking & Finance*, 30, 1065–1102.

Bhayani, S. and Ajmera, B. (2018). An Empirical Study on Effect of Financial Leverage on Firm's Performance and Valuation of Selected Pharmaceutical Companies in India. *Indian Journal of Accounting,* 50(2), 101–110.

Bokpin, G. and Arko, A. (2010). Ownership structure, corporate governance and capital structure decisions of firms: Empirical evidence from Ghana. *Studies in Economics and Finance*, 26(4) 246–256.

Bodie, Zvi, Robert C. Merton, and David L. Cleeton (2009). Financial Economics, 2nd. Edition, Pearson.

Bokpin, G. (2009). Macroeconomic development and capital structure decisions of firms: Evidence from emerging market economies. *Studies in Economics and Finance,* 26(2) 129–142.

Booth, L., Aivazian, V., Demirg̈uç-Kunt, A. and Maksimovic, V. (2001). Capital Structures in Developing Countries. *Journal of Finance*, 56, 87– 130.

Brush, T., Bromiley, P. and Hendrickx, M. (2000). The free cash flow hypothesis forsales growth and firm performance. *Strategic Management Journal*, 21(4), 455–472.

Chathoth, P. and Olsen, M. (2007). The effect of environment risk, corporate strategy, and capital structure on firm performance: an empirical

investigation of restaurant firms. *Hospitality Management*, 26, 502–516.

Chen, J. (2004). Determinants of capital structure of Chinese listed companies. *Journal of Business Research*, 57(12), 1341–1351.

Chechet, I., and Olayiwola, A. (2014). Capital Structure and Profitability of Nigerian Quoted Firms: The Agency Cost Theory Perspective. *American International Journal of Social Science,* 3(1), 139–158.

Dawar, V. (2014). Agency theory, capital structure and firm performance: some Indian evidence. *Managerial Finance,* 40(12), 1190–1206.

Demirguc–Kunt, A. and Maksimovic, V. (1999). Institutions, financial markets and firm debt

Maturity. *Journal of Financial Economics*, 54(3), 295–336.

Deesomsak, R., Paudyal, K., and Pescetto, G. (2004). The determinants of capitalstructure: Evidence from the Asia Pacific region. *Journal of Multinational Financial Management*, 14(4–5), 387–405.

Dimitris, M. and Psillaki, M. (2010). Capital Structure, Equity Ownership and Firm Performance. *Journal of Banking and Finance* 34(3), 621–632.

Ebaid, I. (2009). The impact of capital–structure choice on firm performance: empirical evidence from Egypt. *The Journal of Risk Finance*, 10(5), 477–487.

Eldomiaty, T. and Azim, M. (2008). The dynamics of capital structure and heterogeneous systematic risk classes in Egypt. *International Journal of Emerging Markets,* 3 (1), 7–37.

Eldomiaty, T. (2007). Determinants of corporate capital structure: evidence from an emerging economy. *International Journal of Commerce and*

Management, 17, 25–43.

Elvin, P. and Abdul Hamid, N. (2016). Ownership Structure, Corporate Governance and Firm Performance. *International Journal of Economics and Financial Issues* 6 (S3) 99–108.

Esperança, J., Gama, A. and Azzim, M. (2003). Corporate debt policy of small firms: an empirical (re)examination. *Journal of Small Business and Enterprise Development*, 10, 62–80.

Frank, M. and Goyal, V. (2009). Capital structure decisions: Which factors are reliably important? *Financial Management*, 38(1), 1–37.

Gill, A., Nahum, B. and Neil, M. (2011). The effect of capital structure on profitability: Evidence from the United States. *International Journal of Management,* 28 (4), pp. 3–15.

Gleason, K., Mathur, L.and Mathur, I., (2000). The interrelationship between culture, capital structure, and performance: evidence from European retailers, *Journal of Business Research*, 50 (2), 185–191.

Hadlock, C. and James, C. (2002). Do banks provide financial slack? *Journal of Finance*, 57 (9), 20–34.

Hall, G., Hutchinson, P. and Michaelas, N. (2004). Determinants of the capital structures of European SMEs. *Journal of Business Finance & Accounting*, 31, 711–728.

Herrera, S. and Youssef, H. (2013). Macroeconomic Shocks and Banking Sector Developments in Egypt. *World Bank Policy Research Working Paper*, No. 6314.

Heshmati, A. (2002). The dynamics of capital structure: Evidence from Swedish micro and small firms. *Research in Banking and Finance*, 2,199–241.

Kajananthan R (2012). Effect of Corporate Governance on Capital Structure, Case of the Sri Lankan Listed Manufacturing Companies: *Journal of Arts, Science and Commerce*, 3 (4), 63–71.

Khan, A. (2012). The Relationship of Capital Structure Decisions with Firm Performance: A Study of the Engineering Sector of Pakistan. *International Journal of Accounting and Financial Reporting*, 2(1), 245–262.

King, M. and Santor, E., 2008. Family values: ownership structure, performance and capital structure of Canadian firms. Journal of *Banking & Finance,* 32 (11), 2423–2432.

Kinsman, M. and Newman, J. (1999). Debt level and firm performance: an empirical evaluation. *Paper presented at 28th Annual Meeting of the Western Decision Science Institute*, Puerto Vallarta, Mexico.

Le,T. and Phan, T.(2017). Capital structure and firm performance: Empirical evidence from a small transition country. *Research in International Business and Finance* 42, 710–726.

Lin, F. and Chang, T. (2011). Does debt affect firm value in Taiwan? A panel threshold regression analysis. *Applied Economics*, 43, 117–128.

Madubuko U. (2016). The Effect of Capital Structure on the Financial Performance of Nigerian Quoted Conglomerates. *European Journal of Accounting, Auditing and Finance Research,* 4(6), 61–69.

Margaritis, D.and Psillaki, M., 2010. Capital structure, equity ownership and firm performance. *Journal of* Banking *&* Finance, 34 (3), 621–632.

Majumdar, S. and Chhibber, P. (1999). Capital structure and performance: evidence from a transition economy on an aspect of corporate governance. *Public Choice* 98 (3–4), 287–305.

Milton, H. and Raviv, A. (1991). The theory of capital structure. *Journal of Finance* 46 (1), 297–355.

Myers, S. (2001). Capital structure. *Journal of Economic Perspectives*, 15, 81–102.

Nirajini, A. and Priya, K. (2013). Impact of Capital Structure on Financial Performance of the Listed Trading Companies in Sri Lanka. *International Journal of Scientific and Research Publications,* 3(5), 1–9.

Nunes, P., Serrasqueiro, Z. and Sequeira, T. (2009). Profitability in Portuguese service industries: a panel data approach. *The Service Industries Journal,* 25 (5), 693–707.

Omran, M. and Pointon, J. (2009). Capital structure and firm characteristics: an empirical analysis from Egypt. *Review of Accounting and Finance*, 8 (4), 454–474.

Onaolapo, A. and Kajola, S. (2010). Capital structure and firm performance: evidence from Nigeria. *European Journal of Economics, Finance and Administrative Sciences*, 25, 70–82.

Ooi, J. (1999). The determinants of capital structure evidence on UK property companies. *Journal of Property Investment & Finance,* 17(5), 464–480.

Phillips, P. and Sipahioglu, M. (2004). Performance implications of capital structure: evidence from quoted UK organizations with hotel interests. *The Service Industries Journal*, 24 (5), 31–51.

Rajan, R. and Zingales, L. (1995). What do we know about capital structure? Some evidence from international data. *The Journal of Finance*, 50, 1421–1460.

Ross, S., Westerfield, R.and Jaffe, J. (2008). *Corporate Finance*, 8 th Edition, New York McGraw-Hill Irwin.

Sadeghian, N., Latifi, M., Soroush, S. and Aghabagher, Z. (2012). Debt policy and corporate performance: empirical evidence from Tehran Stock Exchange companies. *International Journal of Economics and Finance*, 4 (11), 217.

Shaker, A. and Hassan, M. (2015). The Effect of Capital Structure on Profitability: An Empirical Analysis of Listed Firms in Iraq. *European Journal of Accounting, Auditing and Finance Research,* 3(2) 61–78.

Singh, M. and Faircloth, S. (2005). The impact of corporate debt on long-term investment and firm performance. *Applied Economics*, 37 (8), 875–883.

Ting, I. and Lean, H. (2011). Capital Structure of Government-Linked Companies in Malaysia, *Asian Academy of Management Journal of Accounting and Finance*, 7 (2), 137–156.

Weill, L. (2008). Leverage and corporate performance: does institutional environment matter? *Small Business Economics*, 30(3), 251–265.

Woldemariam, M. (2016). The Impact of Capital Structure on Financial Performance of Commercial Banks in Ethiopia. *Global Journal of Management and Business Research*, 16 (8) 43–52.

Velnampy, T. (2005). A Study on Investment Appraisal and Profitability. *Journal of Business Studies,* 2, 23–35

Zeitun, R. and Tian, G. (2007). Capital structure and corporate performance: evidence from Jordan. *Australasian Accounting Business and Finance Journal,* 1 (4), 40–53.

Zouari, S. and Taktak, N. (2014). Ownership structure and financial performance in Islamic banks: Does bank Ownership matter? *International Journal of Islamic and Middle Eastern finance and management,* 7 (2), 145–160.