

THE INFLUENCE OF CAPITAL STRUCTURE ON COMPANY PERFORMANCE: EVIDENCE FROM EGYPT

Amani Hussein *

* Business Department, The British University in Egypt, Egypt
Contact details: The British University in Egypt, Suez Desert Road El Sherouk City 11837, Egypt



Abstract

How to cite this paper: Hussein, A. (2020). The influence of capital structure on company performance: Evidence from Egypt. *Corporate Ownership & Control*, 18(1), 8-21.
<http://doi.org/10.22495/cocv18i1art1>

Copyright © 2020 The Author

This work is licensed under a Creative Commons Attribution 4.0 International License (CC BY 4.0).
<https://creativecommons.org/licenses/by/4.0/>

ISSN Online: 1810-3057
ISSN Print: 1727-9232

Received: 18.06.2020
Accepted: 07.09.2020

JEL Classification: M41, G32, C33
DOI: 10.22495/cocv18i1art1

The capital structure decision is crucial for any company to maximize shareholders' wealth and deal with its competitive environment. The research aims to examine the capital structure influence on company performance in Egypt. This research uses a sample of 168 Egyptian companies during 2012-2016 and applies panel data techniques. Eight hypotheses are proposed to test the influence of both the short-term debt and the long-term debt (as proxies of capital structure) on four performance measures (ROA, ROE, EPS, and Tobin's Q). The research results indicate that short-term debt to assets significantly negatively affects all performance measures except for Tobin's Q. Short-term debt to assets significantly positively affects the value of Tobin's Q. On the other hand, the results show that long-term debt to assets affects significantly negatively return on assets but positively affects the return on equity. Therefore, the research concludes that the relevance of the capital structure theory to Egyptian companies' behaviour is influenced by both debt and performance measures utilized.

Keywords: Capital Structure, Company Performance, Trade-Off Theory, Tobin's Q, Egypt

Authors' individual contribution: The Author is responsible for all the contributions to the paper according to CRediT (Contributor Roles Taxonomy) standards.

Declaration of conflicting interests: The Author declares that there is no conflict of interest.

1. INTRODUCTION

Several changes across the world take place through the globalization of economic policies, expanded investment opportunities, diverse financing choices, and increasing dependence on capital markets. Capital is used by the companies to finance their assets, which in turn will generate revenue for the companies, resulting in profits earned. Capital is important for the setting of a new company or for the continuing operations of an existing one (Chakrabarti & Chakrabarti, 2019). The capital structure represents a variety of ways through which enable a company to finance its activities (Olaniyi, Elelu, & Abdulsalam, 2015).

The capital structure decision is very crucial for any company to make for its survival. The company has to decide if it should use the external or internal resources of financing or both to fulfil the company's objective. Moreover, this decision is of great importance for other users of financial information, such as to shareholders, creditors, investors, regulators, analysts, and other stakeholders (Hamid, Abdullah, & Kamaruzzaman, 2015).

The capital structure of any company is broadly classified into two major categories: the first category is the equity finance holders who own a portion of the company's shares. Moreover, the shareholders of a company are eligible to assigned profits of the company called the dividend and they

are the risk bearers. However, the company may retain the profits for financing expansion of its operations in the form of retained earnings. The second category is debt financing that refers to the funds provided to the company, which have to be repaid. They do not directly run the company and have minor control over. They are normally protected by contractual obligations and earn a fixed rate of return. The contractual obligations declare that the return will be paid to them before equity shareholders. Debt financing can be a short-term debt, which can be repaid within a one year, or a long-term debt, can be repaid in a period longer than one year (Kyissima, Xue, Yapatake Kossele, & Abeid, 2019).

A number of theories such as trade-off theory, pecking order theory (information asymmetry), and agency cost theory (free cash flow) have been developed to explain the optimal capital structure choices since the influential studies of Modigliani and Miller "capital structure irrelevancy" (Modigliani & Miller, 1958; Modigliani & Miller, 1963). However, a common conclusion was the inability of one theory to provide a sufficient explanation (Allini, Rakha, McMillan, & Caldarelli, 2018).

A substantial body of literature on determinants of capital structure has investigated the effects of company characteristics such as growth, size, profitability, asset tangibility, tax shields, liquidity, and inside ownership. Moreover, a number of studies have examined the impacts of country-specific factors such as economic growth, interest rate, inflation rate, money supply, market return, and stock market indicator (Moradi & Paulet, 2019). The focus of most researches was on the most important factors that may result in the optimal mix of capital structure (Bandyopadhyay & Barua, 2016).

The optimal capital structure exists only when the debt and equity combine to reduce the cost of capital and enhance the companies' performance (Singh & Bagga, 2019). Company performance allows investors to realize how efficiently a company employs its fund for its operational activities to earn a higher profit (Mangesti Rahayu, Suhadak, & Saifi, 2019). Company performance is significantly affected by various factors and capital structure is one of the most important factors (Salim & Yadav, 2012). Moreover, wrong capital structure decisions can have significant negative impacts if there are excessive debts and financial risks in case the company is unable to pay its due debts (Mangesti Rahayu et al., 2019).

Several empirical studies have been conducted to investigate if there is any (positive, negative, or no) relation between the company's performance and capital structure; however, the results are still inconclusive and mixed (Ahmed & Afza, 2019; Salim & Yadav, 2012). Therefore, it is important to understand the relationship between capital structure and company performance and measure the main attribute of capital structure that could influence the company performance because the long-term survivability of the company heavily depends on its performance and sound capital structure decision (Hamid et al., 2015).

Egypt started the stock market activity in 1881. An essential economic improvement programme occurred from 1991 and ever since there has been

a rise in stock market activity, the number of traded companies and the stock market have become more competitive (Omran & Pointon, 2009). However, capital and stock markets in emerging markets are relatively less efficient and incomplete than their developed markets. This affects capital structure decisions to be imperfect and inappropriate (Eldomiaty, 2007). Moreover, with the less efficient equity market, poor bond market, and a semi bank-oriented financial system, the profitability role becomes vital, either in the short-run to meet dividends and current needs, or in the long-run as retained earnings to meet investments needs (Allini et al., 2018).

Some studies (Eldomiaty, 2007; Omran & Pointon, 2009; Youssef & El-ghonamie, 2015; Sakr & Bedeir, 2019) are conducted in Egypt to examine capital structure determinates in Egypt; however, up to the author's best knowledge, there is only one study (El-Sayed Ebaid, 2009) using small sample 64 that has been conducted during 1997-2005 within the Egyptian context that focused on the impact of capital structure on company performance. Recently, studies on emerging markets have gained in popularity and a need for more investigation. Therefore, it is necessary to conduct a recent research applying panel data techniques and using a large sample of 168 Egyptian companies during 2012-2016 as an example of emerging economies in order to fill the gap and contribute to literature through a better understanding of how capital structure influences the company performance in Egypt. Therefore, fulfilling the research aim will be achieved by answering the main research question: *What is the influence of capital structure on the company performance of the Egyptian companies?*

The research is organized as follows: Section 2 is devoted to the literature review, Section 3 to research methodology, Section 4 to findings and discussions, and the last section for a conclusion.

2. LITERATURE REVIEW

2.1. The theoretical framework

Capital structure and its effect on the company performance are core issues in finance and there are a number of theories explaining this relationship (Le & Phan, 2017). However, Ardalan (2017) claims that all these theories are based on different critical assumptions, while the real society is complicated and diversified.

2.1.1. Modigliani-Miller (MM) theory

This theory is also known as "capital structure irrelevance" and established by Modigliani and Miller (1958), is considered as the cornerstone theory. The theory assumes that the choice between debt and equity financing has no significant effect on the company's value. It was based on very limited assumptions that do not apply in the real world. The assumption that capital markets are perfect where stakeholders share free access to information, there are no taxes and no transaction costs. However, Modigliani and Miller in 1963 reviewed their

previous assumptions by incorporating tax benefits as determinants of the capital structure of the company.

Therefore, to account for an imperfect market, other theories have been suggested as alternatives to MM theory namely: trade-off theory, pecking order theory, agency theory, and market timing theory.

2.1.2. Trade-off theory (TOT)

Originally introduced by Kraus and Litzenberger (1973) as one of the most influential theories of capital structure, focuses on the trade-off between debt tax-saving and bankruptcy costs. It assumes an optimal capital structure exists when the net tax advantage of debt financing is balanced with bankruptcy costs (Sakr & Bedeir, 2019). Under the trade-off theory framework, it is suggested that the company is setting a target debt to equity level and gradually is trying to reach it (Youssef & El-ghonamie, 2015). Profitable companies are more likely to issue debt over equity. The issuance of debt is likely to add pressure on management to generate cash flows toward the repayment of the debt, otherwise, it faces bankruptcy (Obay, 2018).

The trade-off theory suggests a positive relationship between profits earned and capital structure. Increased usage of debt will lead to higher profits due to tax saving (Chakrabarti & Chakrabarti, 2019). However, using large amounts of debt will reduce profitability due to increasing the cost of debt. Thus, the trade-off theory suggests using debt beyond the risky level (Chandra et al., 2019).

2.1.3. Pecking order theory (POT)

This theory is also referred to as the theory of information asymmetry and was proposed by Myers (1984). The theory pointed out that information asymmetry between managers and investors could support managers to become well informed about their own company's predictions than are outside investors. Myers and Majluf (1984) claimed that companies with high profitability have sufficient internal funding resources "retained earning", therefore, will use it rather than external sources of funds. Moreover, this theory suggests that in case the company needs funds it will use debt, and finally, it will issue equity if it is still in need of additional capital. The use of external sources of funds will only lead to information asymmetry, which will increase the cost of capital and ultimately reduce the profitability and company value (Chandra et al., 2019). Thus, suggesting a negative relationship between profitability and capital structure (Chakrabarti & Chakrabarti, 2019). Therefore, it can be concluded that the pecking order theory hypothesis that companies that are profitable are expected to use less debt capital than those that are not profitable.

2.1.4. Agency theory

Agency theory also referred to as "free cash flow theory", developed by Jensen and Meckling (1976), who claimed that there are two kinds of agency

costs. The agency cost of equity caused by the conflict between shareholders and managers, and the agency cost of debt caused by the conflict of debt holders and equity holders. The conflict between managers and shareholders implies that managers try to achieve their personal aims instead of maximising the company's value and shareholders' returns. For example, with excess free cash flow, managers have opportunities to invest in non-profitable projects for personal goals (Jensen & Meckling, 1976, as cited in Olaniyi et al., 2015). The Agency theory assumes that debt presents fixed obligations (debt interests and principals to pay) that must be paid by the company (Eldomiaty, 2007). It increases the pressure on managers, encouraging them to perform more efficiently (Yazdanfar & Öhman, 2015). Therefore, through reducing agency costs relating to managers and shareholders, debt can have a positive effect on company value (Le & Phan, 2017). As such, it should be expected that a positive relationship will exist between corporate performance and company capital structure under agency theory (Olaniyi et al., 2015).

Whereas debt is an efficient means to reduce shareholder-manager conflict, it increases shareholder-debt holder conflict. In addition, higher interest rates will be required when debt is high to compensate for the higher risk of liquidation. Accordingly, debt will have a negative effect on a company's value (Le & Phan, 2017).

2.1.5. The market timing theory

Introduced by Baker and Wurgler (2002) who argue that company managers will use the low-priced sources of funds at that time. The use of debt or equity depends on which one is the cheapest at that time. If the debt is cheaper than equity at that time, the source of debt will be used. Conversely, if equity is cheaper, the equity will be used (Baker & Wurgler, 2002, as cited in Chandra et al., 2019). As a result, differences in stock prices influence a company's capital structures (Singh & Bagga, 2019).

2.2. Previous studies

2.2.1. Company characteristics determinates studies

Previous studies revealed that the capital structure of the companies is influenced by various factors such as company characteristics factors, industry factors, and country factors. The most common studied company characteristics factors of capital structure determinants are the profitability of the company, size, tangibility, liquidity, growth, business risk, and financial flexibility (Sakr & Bedeir, 2019). Table 1 shows some of these studies that covered the capital structure determinates.

Table 1. Capital structure determinate studies

<i>Author & year</i>	<i>Country, sample & period</i>	<i>Determinates examined</i>	<i>Significant determinates</i>
Ooi (1999)	UK 83 property companies 1989-1996	<i>Dependent variable:</i> total debt ratios (TDR); <i>Independent (10) variables:</i> property asset intensity (PAI), level of trading (TRD) and development (DVT) activities, company size (SZE), growth rate (GRW), profitability (PRF) systematic risk (RSK), effective tax rates (TAX), risk-free interest rate (INT), and performance of property stocks (MKT).	Property asset intensity ratio, trading activity, development undertaking, company size, systematic risk, interest rate and performance of property stocks.
Eldomiaty (2007)	Egypt 99 Companies 1998-2004	<i>Dependent variable:</i> long-term debt and short-term debt; <i>Independent variables:</i> examined a comprehensive number of determinants of capital structure to cover the three theories of capital structure.	Trade-off-related determinants: taxes, debt/equity ratio, and bankruptcy risk. Pecking order-related determinants: growth and profitability; Free cash flow: no determinants.
Omran and Pointon (2009)	Egypt 122 companies 1998-1999	<i>Dependent variables:</i> financial leverage, long-term capital structure, the short-term debt financing ratio, and the interest ratio; <i>Independent variables:</i> liquidity, asset structure, growth, size, taxation, and stock market activity.	Size, asset growth, liquidity, and taxation.
Youssef and El-ghonamie (2015)	Egypt: 18 companies 2003-2012	<i>Dependent variables:</i> the debt ratio and long-term debt ratio; <i>Independent variables:</i> company's profitability, size, tangibility growth, non-debt tax shields, and liquidity.	Company's profitability, size, and tangibility.
Chipeta and Deressa (2016)	12 countries within Sub-Saharan Africa 412 companies 2008-2012.	<i>Dependent variables:</i> total debt, long debt; <i>Independent variables:</i> company's profitability, size, tangibility, growth, tax, and risk.	Company's profitability and asset tangibility.
Bandyopadhyay and Barua (2016)	India 1594 companies 1998-2011	<i>Dependent variable:</i> long term debt; <i>Independent variables:</i> company size, age, and company quality, tangibility, growth option, liquidity, retained earnings, and ownership structure.	Size, age, and company quality, tangibility of its assets, growth option, liquidity, retained earnings, and ownership structure.
Shambor (2017)	346 companies of the Global Oil and Gas Index 2000-2015	<i>Dependent variable:</i> total debt to total assets; <i>Independent variables:</i> liquidity, profitability, growth, non-debt tax shield, tangibility, and size.	Company's profitability, tangibility, size, liquidity, and non-debt tax shield.
Obay (2018)	Arab countries GCC 150 companies 2000-2009	<i>Dependent variable:</i> total debt, long-term debt, short-term debt, and total debt to total equity. <i>Independent variables:</i> profitability, growth, size, non-debt tax shield, tangibility, and risk.	Company's profitability, non-tax-shield, size, and tangibility.
Sakr and Bedeir (2019)	Egypt 62 companies 2003-2016.	<i>Dependent variable:</i> total debt, long-term debt, and short-term debt; <i>Independent variables:</i> profitability, growth, size, tangibility, liquidity, business risk, and financial flexibility.	Company's profitability, size, tangibility, liquidity, growth, business risk, and financial flexibility.

2.2.2. Capital structure and performance studies

According to the capital structure determinates studies shown in Table 1, the majority of these studies were in line with Ahmad and Abdul Rahim's (2013) conclusion that it is not sufficient to use one measure of the capital structure. Alternatively, the studies use more than one measurement such as a combination of total debt to total assets (TD), short-term debt to total assets (STD), and long-term debt to total assets (LTD) as the proxies for the capital structure of the company. Moreover, in the majority of the studies, the profitability is one of the most significant determinates. Profitability is also known as financial performance, and the way companies raise their funds has an impact on both the performance and the value of the company (Obay, 2018). Company performance reflects how effectively companies manage their resources (Abor, 2005).

Furthermore, the empirical literature employs different measures of company performance to test its relationship with capital structure Weill (2008). examined various studies in this context and found that "different conclusions can result from the differences in performance measures" (Weill, 2008, p. 251, as cited in Wahba, 2014).

Several studies were conducted to test the company's performance from two different perspectives: the company perspective using accounting-based measures and the market perspective using market-based measures (Abor, 2005; Salim & Yadav, 2012; Dawar, 2014; Tifow & Sayilir, 2015; Le & Phan, 2017). The accounting-based measures calculated from the company's financial statements such as return on assets (ROA) as net income to total assets, and return on equity (ROE), the ratio of net income to shareholders' equity. These refer to how much profit companies earn based on their asset investments, and how effective managers use investors' funds (Abor, 2005; Vátavu, 2015). While Tobin's Q and earning per share (EPS) were used to capture the company's market performance. The EPS is measured as net income divided by a number of shares outstanding. Tobin's Q is calculated by dividing a company's total market value by its total asset value. The company's market value contains the market value of debt and market value of equity (Dawar, 2014; Tifow & Sayilir, 2015; Le & Phan, 2017). Table 2 reveals the studies that covered the relationship between capital structure and company performance.

Table 2. Capital structure and company performance studies

Author & year	Country, sample & period	Performance variables	Capital structure variables	Finding and the main conclusion
Abor (2005)	Ghana 22 companies 1998-2002	ROE	STD, LTD, and TD	A significant <i>positive</i> relation between STD, TD, and ROE. A significant <i>negative</i> relationship between the LTD and ROE. <i>Main conclusion:</i> the profitable companies depend more on debt as their main financing option.
El-Sayed Ebaïd (2009)	Egypt 64 companies 1997-2005	ROE, ROA, and Gross profit (GM)	STD, LTD, and TD	There is a <i>negatively</i> significant influence of STD and (TD) on ROA. There is <i>no significant influence</i> (STD, LTD, and TD) on both ROE and GM. <i>Main conclusion:</i> the capital structure choice decision has a weak-to-no impact on the company's performance.
Salim and Yadav (2012)	Malaysia 237 companies 1995-2011	ROA, ROE, Tobin's Q, and Earning per share (EPS)	STD, LTD, and TD	The three performance ROA, ROE, and EPS have a negative relationship with STD, LTD, and TD. Tobin's Q has a significant positive relationship with STD and LTD. <i>Main conclusion:</i> company performance is positively or even negatively related to capital structure.
Dawar (2014)	India 78 companies 2003-2012	ROA and ROE	STD and LTD	A significant negative relationship between debt both short term and long term and company's performance ROA and ROE. <i>Main conclusion:</i> capital structure negatively impacts the company's performance.
Hamid et al. (2015)	Malaysia 276 companies 2009-2011	ROE	STD, LTD, and TD	A significant negative relationship between capital structure and performance in all three capital structure measurements except for the STA in family companies. <i>Main conclusion:</i> results were consistent with the pecking order theory.
Vătavu (2015)	Romania 196 companies 2003-2010	ROA and ROE	STD, LTD, TD, and Equity ratio	Shareholders' Equity ratio has a positive impact on performance indicators, while TD and STD have negative relationships with ROA and ROE. <i>Main conclusion:</i> the companies prefer debt when they face financial difficulties and high business risks.
Tifow and Sayilir (2015)	Turkey 130 Companies 2008-2013	ROE, ROA, EPS, and Tobin's Q	STD and LTD	<i>STD</i> has a significant negative relationship with ROA, EPS, and Tobin's Q. <i>LTD</i> has a significant negative relationship with ROE, EPS, Tobin's Q, and a significant positive relationship with ROA. <i>Main conclusion:</i> using debt financing may lead to lower company's performance.
Olaniyi et al. (2015)	US 200 companies 2003-2012	ROE, ROA, Price per share (P/E ratio), EPS, and Tobin's Q	Debt to equity ratio (DE)	Only ROE has a negative relationship with capital structure while other performance measures showed an insignificant relationship. <i>Main conclusion:</i> the capital structure is not a major determinant of the company's performance.
Le and Phan (2017)	Vietnam all listed companies 2007-2012	ROA, ROE, and Tobin's Q	STD, LTD, and TD	All debt ratios have a significantly negative relation to company performance <i>Main conclusion:</i> the results support that in a typical developing market like Vietnam, the benefits of debt from tax saving may be less than financial distress cost.
Forte and Tavares (2019)	Nine European countries 48,840 companies 2008-2013	ROA and ROE	STD, LTD, and TD	The impact of debt on a company's performance depends on the measure of debt. STD positively affects a company's performance, whereas LTD shows a negative relationship. <i>Main conclusion:</i> a positive effect of debt on a company's performance tends to be higher the greater the "efficiency of the legal system" and the "credit market regulation."
Ahmed and Afza (2019)	Pakistan 396 companies 2006-2013	ROA, ROE, and Tobin's Q	STD, LTD, and TD	The capital structure negatively affects the ROA and ROE but positively impacts Tobin's Q. <i>Main conclusion:</i> capital structure is significantly harmful for the financial performance of the companies in the presence of competitive intensity.

2.3. Hypotheses development

A number of empirical studies have been conducted in different countries as shown in Table 2 to investigate if there is any (positive, negative, or no) relation between company performance and capital structure, however, the results are still inconclusive and mixed (Ahmed & Afza, 2019; Tifow & Sayilir, 2015; Dawar, 2014; Salim & Yadav, 2012; El-Sayed Ebaid, 2009). According to Vätavu (2015) and Olaniyi et al. (2015) who suggested future research that applies different performance indicators for a better understanding of how capital structure influences the company performance. Therefore, this research adopted this suggestion by examining the influence of capital structure on company performance using four performance measures. Accordingly, eight hypotheses are proposed. These hypotheses aim to test the influence of both the short-term debt and long-term debt (as they serve as proxies of capital structure) on every one of the accounting performances measures (ROA and ROE) and the market performances measures (EPS and TQ) as follows:

H1: There is a significant influence of the short-term debt to assets on the earnings per share.

H2: There is a significant influence of the long-term debt to assets on the earnings per share.

H3: There is a significant influence of the short-term debt to assets on the return on assets.

H4: There is a significant influence of the long-term debt to assets on the return on assets.

H5: There is a significant influence of the short-term debt to assets on the return on equity.

H6: There is a significant influence of the long-term debt to assets on the return on equity.

H7: There is a significant influence of the short-term debt to assets on the value of Tobin's Q.

H8: There is a significant influence of the long-term debt to assets on the value of Tobin's Q.

3. RESEARCH METHODOLOGY

3.1. Sample and data collection

Several studies investigated the relationship between capital structure and company financial performance in different countries, little is empirically known about Egypt. Thus, the Egyptian stock market is a good example of emerging economies that need more investigation. Initially, a total of 222 listed companies represent 11 different industry sectors such as Telecommunications, Food and Beverage, Chemicals, and Household and Personal Products. The final sample size includes 168 non-financial companies that are listed on the Egyptian Stock Exchange and represents almost all the industry sectors except companies in the financial industry classification, including banks, insurance, and financial services that were excluded because of their unique government capital structure, their strict legal requirements, and their quite different operations (Allini et al., 2018; Le & Phan, 2017; Wahba, 2014). The research data was based on secondary data obtained from the Thomson Reuters database. The data consists of accounting and financial information of 168 companies during the period 2012 to 2016 providing 777 observations as a unit of analysis.

The market capitalization of the listed stocks in the main market was LE 601 billion, LE 430 billion, and LE 500 billion for the years 2016, 2015, and 2014 respectively. However, market capitalization for the sample sectors in the year 2016 was LE 385, in the year 2015 was LE 305 billion and in the year 2014 was LE 375 billion, representing 64%, 71%, and 75% of the total companies listed (The Egyptian Exchange, 2016, 2015, 2014).

3.2. Measurement of variables

3.2.1. Capital structure variables (independent variables)

The capital structure be measured in different ways, including the long-term debt to total assets (LTD), the short-term debt to total assets (STD), and total debts to total assets (TD) (Forte & Tavares, 2019; Le & Phan, 2017; Vätavu, 2015). In this research, capital structure measures focus on long-term debt and short-term debt in order to cover the total duration of debt. The STD ratio is defined as debt repayable within one year, as a percentage of total assets, while the LTD ratio is defined as debt repayable beyond one year, as a percentage of total assets (Yazdanfar, Öhman, & Homayoun, 2019, p. 929).

3.2.2. Company performance variables (dependent variables)

This research aims to examine the capital structure's influence on company performance by applying two different measures. The accounting measures include return on assets (ROA) as net income to total assets and return on equity (ROE), the ratio of net income to shareholders' equity. While the market performance measures include EPS net income divided by a number of shares outstanding and Tobin's ratio calculated by dividing a company's total market value by its total asset value.

3.2.3. Control variables

The company size and sales growth are included as control variables to account for company-related factors and also to minimize specification bias in the model. Some researchers suggest that the size of the company may have an influence on its performance owing to differences in the operating environment, access to the markets, diversification of business, and information asymmetry (Dawar, 2014; El-Sayed Ebaid, 2009; Wahba, 2014). Moreover, company size may also act as a proxy for the company's reputation. Lenders will be willing to lend larger firms than smaller ones especially in emerging markets, where risk aversion is common. Additionally, larger Egyptian firms might have more access ability to the capital market, and a better negotiation position with banks (Allini et al., 2018). The size control variable is measured in most researches as the natural logarithm of the company's total assets (Salim & Yadav, 2012).

In addition, sales growth is one of the capital structure determinants. It is hypothesised that a company with a more growth opportunity will have a better performance because it generates additional income from new investment projects (Zeitun & Saleh, 2015). The rate of change in sales or

sales growth, used before in (Tifow & Sayilir, 2015), is calculated as the difference between sales at the time (t) and sales at the time ($t-1$) divided by sales at the time (t).

3.3. Research model

Four models are built for each one of the dependent performance variables, which include: *earnings per share*, *return on assets*, *return on equity*, and *Tobin's Q*. The independent variables in each of the four models are the *short-term debt to assets* and the *long-term debt to assets*, in addition to the two control variables that include company size log (*total assets*) and *sales growth*. The two control variables, which were used before in similar models by the

literature, are indicators that could affect its profitability or performance.

This research employs the panel data analysis to build the four models of interest. The use of panel or longitudinal data allows detecting patterns that cannot be observed in only cross-sectional or time-series data. Panel data help increase the sample size, usually, show more variability than pure cross-section or pure time-series data do, decrease collinearity, and allow to control for individual or time heterogeneity (Abor, 2005, pp. 441-442; Park, 2011, p. 1; Pillai, 2016, p. 6). This paper adopts a methodology similar to that used in Salim and Yadav (2012), Tifow and Sayilir (2015).

The general forms of the four models used for each of the dependent profitability measures are as follows:

Model 1

$$EPS_{it} = \beta_{0i} + \beta_1(STDTA)_{it} + \beta_2(LTDTA)_{it} + \beta_3 \ln(TA)_{it} + \beta_4(Growth)_{it} + u_{it} \quad (1)$$

Model 2

$$ROA_{it} = \beta_{0i} + \beta_1(STDTA)_{it} + \beta_2(LTDTA)_{it} + \beta_3 \ln(TA)_{it} + \beta_4(Growth)_{it} + u_{it} \quad (2)$$

Model 3

$$ROE_{it} = \beta_{0i} + \beta_1(STDTA)_{it} + \beta_2(LTDTA)_{it} + \beta_3 \ln(TA)_{it} + \beta_4(Growth)_{it} + u_{it} \quad (3)$$

Model 4

$$TQ_{it} = \beta_{0i} + \beta_1(STDTA)_{it} + \beta_2(LTDTA)_{it} + \beta_3 \ln(TA)_{it} + \beta_4(Growth)_{it} + u_{it} \quad (4)$$

where:

EPS_{it} is earnings per share for company i at time t ;
 ROA_{it} is return on assets for company i at time t ;
 ROE_{it} is return on equity for company i at time t ;
 TQ_{it} is Tobin's Q for company i at time t ;
 $STDTA_{it}$ is short-term debt to assets for company i at time t ;
 $LTDTA_{it}$ is long-term debt to assets for company i at time t ;
 $\ln(TA)_{it}$ is the natural logarithm of total assets for company i at time t ;
 $Growth_{it}$ is sales growth for company i at time t ;
 $\beta_{0i}, \beta_1, \beta_2, \beta_3, \beta_4$ are the coefficients of the model and u_{it} is the error term.

There are three models that can be tested for use with panel data. These models are the Pooled OLS Regression, Fixed Effects, and Random Effects Models. The research runs the three models and uses statistical tests to choose the most appropriate one among them for each of the four performance variables. The F-test is used to choose between the Pooled OLS and Fixed Effects Models; Breusch-Pagan Lagrange multiplier (LM) test is used to choose between the Pooled OLS and Random Effects Models; and Hausman test is used to choose between the Fixed and Random Effects Models.

4. RESULTS AND DISCUSSION

A substantial research in developed and developing countries examined the relationship between capital structure and company performance; however, these researches reached contradictory results with regard to the influence of capital structure on company performance. Therefore, this research examined this

issue using a sample of 168 listed companies during 2012-2016 period in one of the developing countries, namely Egypt.

The research begins with a descriptive analysis of the variables used to measure the company's performance and capital structure. Table 3 presents a summary of the descriptive statistics for these variables. The table shows that mean earnings per share (EPS) are 1.26 LE per share, while its standard deviation indicates a big dispersion among companies in this measure of performance. Companies are close to each other in terms of their return on assets (ROA), whereas their return on equity (ROE) varies a lot. On the other hand, the averages of the return on asset and the return on equity are almost the same with values of 4% and 3% respectively. This suggests a low performance during the period under research. The values of Tobin's Q also indicate high variations among companies.

The descriptive statistics of the capital structure measures show that the percentages of short-term debt and long-term debt to assets are close to each other with large differences, or standard deviations, among companies. The Egyptian companies are financed with 8% short-term debt and 7% long-term debt. This indicate minor dependence of Egyptian companies on either short- or long-term debt. This means that the studied companies generally depend on internal financial sources. During the entire period of research, sales of all different companies grew by an average of 77% annually. Companies are more similar to each other in the values of their total assets compared to sales growth.

Table 3. Descriptive statistics

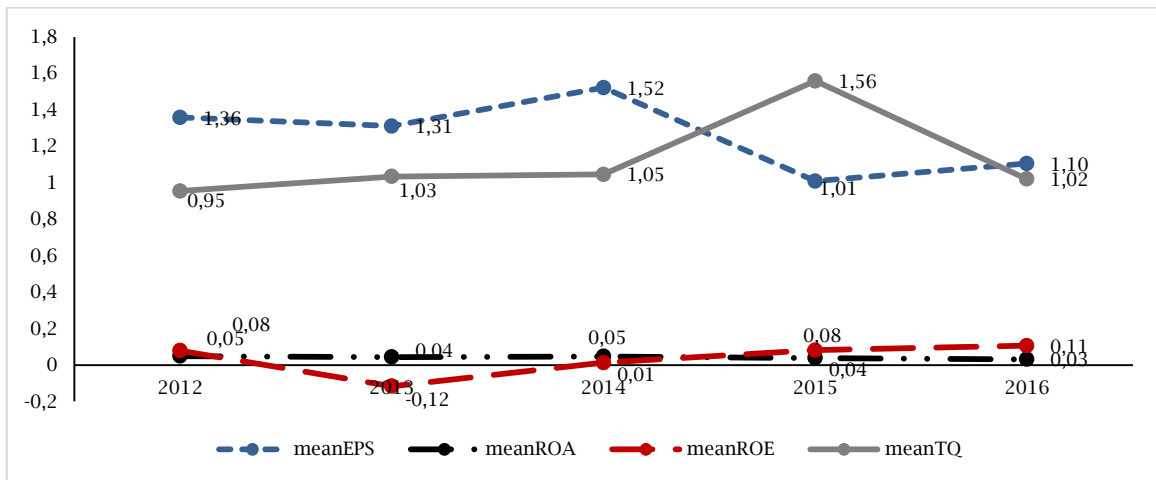
Variable	N	Mean	Standard deviation	Minimum	Maximum
<i>Profitability measures</i>					
Earnings per share	777	1.26	4.97	-27.50	72.23
Return on assets	772	0.04	0.11	-0.69	0.57
Return on equity	759	0.03	1.02	-22.36	2.43
Tobin's Q	744	1.13	2.95	0.01	65.62
<i>Capital structure measures</i>					
Short-term debt to assets	777	0.08	0.13	0.00	1.09
Long-term debt to assets	777	0.07	0.14	0.00	1.71
<i>Control variables</i>					
ln (Total assets)	777	5.63	0.98	0.00	6.62
Sales growth	777	0.77	17.01	-6.05	472.50

Source: calculated by the researcher.

Figures 1, 2, and 3 illustrate the time trend of annual averages for the financial performance, capital structure, and control variables respectively. The annual average percentage of return on equity started to rise noticeably above the return on assets in 2015 and 2016. In addition, the annual mean values for Tobin's Q were witnessing an increasing trend till 2016 where it sharply declined.

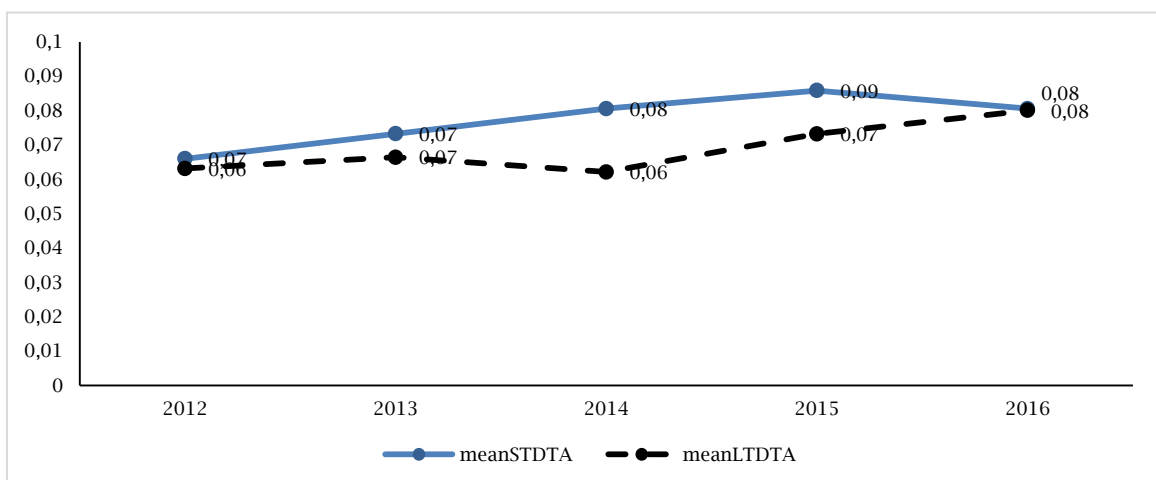
Figure 2 shows that the percentages of short-term debt and long-term debt to assets and are very close to each other. The trend of assets owned by all companies during the entire period of research is relatively stable compared to sales growth which steadily increased from 2012 until reaching its highest value in 2014; afterwards it declined sharply in 2015 and then rebounded in 2016.

Figure 1. Time trends of annual averages for the performance variables



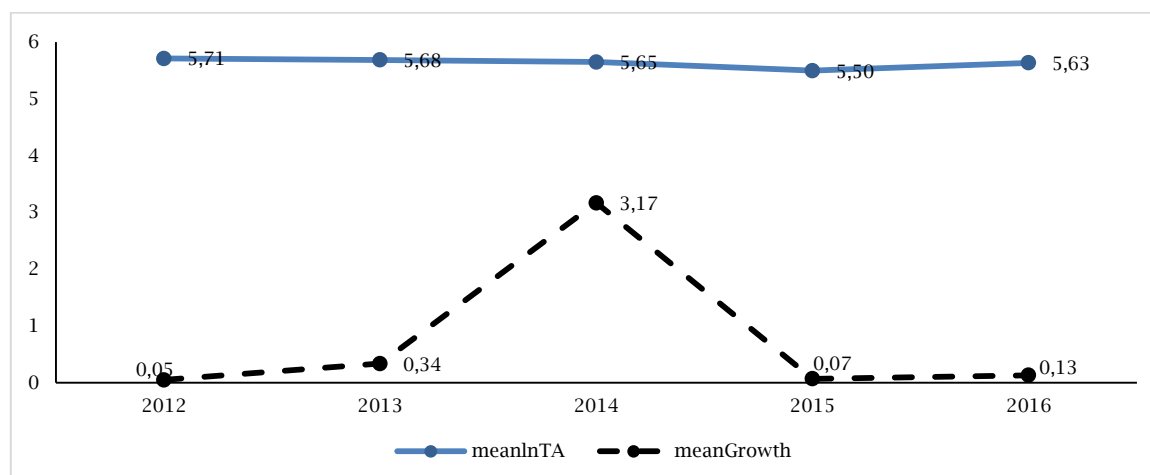
Source: calculated by the researcher.

Figure 2. Time trends of annual averages for the capital structure variables



Source: calculated by the researcher.

Figure 3. Time trends of annual averages for the control variables



Source: calculated by the researcher.

The next step in the analysis is to build the panel data models for each of the four performance-dependent variables. The research uses the STATA software package in the analysis. Before building the models, the relationships between the four dependent variables and each of the independent

variables are analysed using the scatter diagrams that indicate linear relationships, which means that the variables do not need transformations to be entered in the models. In addition to correlation coefficients as shown in Table 4.

Table 4. The correlation coefficients

	<i>lnTA</i>	<i>STDTA</i>	<i>LTDTA</i>	<i>Growth</i>
EPS	-0.039	-0.118***	-0.067*	-0.007
ROA	-0.042	-0.398***	-0.256***	-0.007
ROE	0.003	-0.105***	-0.027	0.001
TQ	0.026	0.183***	-0.033	0.002

Notes: *** Significant at 1%; ** Significant at 5%; * Significant at 10%.

As shown in Table 4 all the performance measures are negatively and significantly related to all short-term debts except TQ is positively significantly correlated. In addition, only two company performance measures EPS and ROA are negatively significantly correlated to long term debts.

Therefore, the research results for OLS, fixed-effects, and random-effects are done, the F-test reveals that the fixed-effects method is better than the OLS because the F-test is significant.

Alternatively, the LM test is significant, except for ROE, thus the random-effects method is preferred to the OLS. Finally, the Hausman test is made to choose between the fixed- or random-effects methods. The results show that the most appropriate model for all measures of performance expected earnings per share is the fixed-effects model. The random-effects model is selected for earnings per share. Table 5 shows a summary of the results of the tests and the selected models.

Table 5. Summary of the results of the F-test, the Breusch-Pagan Lagrange multiplier (LM) test, the Hausman test, and the selected models

Variable	F-test (p-values)	Breusch-Pagan (LM) test (p-values)	Hausman test (p-values)	Selected model
Earnings per share	0.0000	0.0000	0.2716	Random effects
Return on assets	0.0000	0.0000	0.0095	Fixed effects
Return on equity	0.0000	0.4448	0.0013	Fixed effects
Tobin's Q	0.0000	0.0000	0.0000	Fixed effects

Source: calculated by the researcher.

The results of the models are shown in Table 6. The models selected to represent the relationship

between the performance and capital structure measures. Detailed results are shown in Appendix.

Table 6. Summary of the models' results - Beta coefficients

Variable	Earnings per share	Return on assets	Return on equity	Tobin's Q
Short-term debt to assets	-6.32***	-0.52***	-3.46***	19.88***
Long-term debt to assets	-2.30	-0.16***	2.29***	1.36
Company size (lnTA)	-0.07	0.00	0.02	-0.04
Growth	-0.00	0.00	0.00	0.00

Notes: *** Significant at 1%; ** Significant at 5%; * Significant at 10%.

Source: calculated by the researcher.

The results indicate that short-term debt to assets (STD) significantly negatively affects all ROA, ROE, and EPS. In terms of the company's performance, ROA result is consistent with El-Sayed Ebaid (2009), Salim and Yadav (2012), Dawar (2014), Le and Phan (2017). However, for ROE result, it is in line with Salim and Yadav (2012), Dawar (2014), Le and Phan (2017) and inconsistent with other studies that indicate a significant positive relation between ROE and STD (Abor, 2005) with no significant relationship (El-Sayed Ebaid, 2009; Tifow & Sayilir, 2015). Moreover, EPS results are consistent with some studies (Salim & Yadav, 2012; Tifow & Sayilir, 2015). Furthermore, this result highlighted the relationship of STD with three of the performance measures that are consistent with pecking order theory which assumes a negative relationship between performance and capital structure and that companies that are profitable are expected to use less debt capital than those that are not profitable.

However, Tobin's Q results indicate a significant positive relationship with that short-term debt to assets. This result is in line with Salim and Yadav (2012) and inconsistent with Le and Phan (2017), Tifow and Sayilir (2015). This result agrees with trade-off theory and agency theory that assume a positive relationship with performance since increased usage of debt will lead to higher profits due to tax saving (Chakrabarti & Chakrabarti, 2019). To summarise, short term debt has a significant relationship with all performance measures ROA, ROE, EPS, and Tobin's Q which indicate accepting the four hypotheses related to short term debt *H1*, *H3*, *H5*, and *H7*.

On the other hand, long-term debt to assets significantly negatively affects return on assets ROA consistent with Le and Phan (2017), Salim and Yadav (2012), and inconsistent with Tifow and Sayilir (2015). In addition, the results show that long-term debt to assets significantly positively affects the return on equity ROE consistent with Tifow and Sayilir (2015), inconsistent with Abor (2005), Salim and Yadav (2012), and without significant relation with El-Sayed Ebaid (2009). Moreover, the results reveal an insignificant impact of LTD on either EPS or Tobin's Q. Additionally, the long-term debt significant relationship with ROA and ROE can support the research hypotheses *H4*, *H6*. Alternatively, the long-term debt insignificant relationship with EPS and Tobin's Q confirms rejecting *H2* and *H8*. The results indicate that long term debt relationship can be in line with either trade-off theory or pecking order theory based on the performance measure.

Furthermore, the results indicate that sales growth rate and company size have no significant relation with company's performance that is consistent with Tifow and Sayilir (2015). However, other studies pointed out that company size has a positive influence on performance (Abor, 2005; El-Sayed Ebaid, 2009; Dawar, 2014; Yazdanfar & Öhman, 2015) and some argue a negative relationship (Forte & Tavares, 2019). Moreover, the research results are inconsistent with most studies which indicated that growth is positively related to company performance (Dawar, 2014; Hamid et al., 2015; Le & Phan, 2017).

It is important to shed light on a specific point that may interpret these results. As indicated by Delmar, Davidsson, and Gartner (2003), that a company's growth profile is related to its size and industry. Therefore, the relationship between growth and company performance should take into consideration the industry effects. Industry effects arise from the differences in the average performance of the individual company within each different industry that reflects industry-specific factors such as competitive behavior and asset utilization rate (Chi, Lieu, Hung, & Cheng, 2016). Thus, it is logical to consider that companies, operating in a competitive industry, are more expected to have lower performance. On the other hand, companies, in established industries, are linked with lower levels of growth opportunity (Li & Islam, 2019). Moreover, Pouraghajan, Malekian, Emamgholipour, Lotfollahpour, and Bagheri (2012), in their research results, show that companies, belonging to some industries, have a negative and significant effect; whereas, other companies, belonging to other industries have positive and significant effects on the financial performance. Therefore, it can be inferred that including industry effects on companies' performance may indicate more well-defined results.

To sum up, the research findings are consistent with Weill (2008) who pointed out that adopting different company's performance measures to test its relationship with capital structure can result in different conclusions. It can be concluded that the majority of the performance measures are negatively related to either short- or long-term debt and this inverse relationship can be interpreted consistently with (Chakrabarti & Chakrabarti, 2019), who claim that increasing debt can reduce and extinguish profitability through interest payment and principal payment obligations. Moreover, it is in line with Le and Phan (2017) who argue that the role of debt, as a monitoring tool to improve company performance, is not substantial in emerging markets. Accordingly, this research agrees with Allini et al. (2018) who pointed out that internal resources' funds are the preferred selection for the Egyptian companies.

5. CONCLUSION

The capital structure decision is crucial for any company to maximize shareholder's wealth and deal with its competitive environment. It is one of the important factors that affect company performance. Although there were alternative capital structure theories that have been developed during past decades so as to resolve the optimal capital structure puzzle. Both the theoretical perceptions and the empirical studies reached diverse results concerning the influence of capital structure on company performance. Moreover, the empirical studies reveal that the impact of capital structure on a company performance depends on the measure of debt (Forte & Tavares, 2019).

Egypt is one of the most important countries in the Middle East, and one of the emerging markets, up to the researcher's best knowledge only one research (El-Sayed Ebaid, 2009) studied the relationship of capital structure and company performance. Therefore, this research fills the gap in

such a vital country like Egypt by conducting more recent research and using larger sample 168 Egyptian companies during 2012-2016 and panel methodology to examine the influence of capital structure on company performance measures.

The research results indicate that short-term debt to assets significantly negatively affects all performance measures except for Tobin's Q. Short-term debt to assets significantly positively affects the value of Tobin's Q. On the other hand, the results show that long-term debt to assets affects significantly negatively return on assets but positively affects the return on equity. The results finding was in agreement with other studies (Eldomiaty, 2007; Sakr & Bedeir, 2019) that show the relevance of both the trade-off and pecking-order theories to Egyptian capital structure behaviour. However, no one theory can provide all the explanation (Allini et al., 2018). Therefore, the research concludes that the relevance of the capital structure theory to Egyptian companies' behaviour is influenced by both debt and performance measures utilized.

According to Allini et al. (2018), who pointed out that Egypt has a less efficient equity market and poor bond market therefore, the research recommends that government and regulatory authorities to develop the bond market to support companies to acquire funds by issuing company bonds.

Similar to any academic research, this research is subject to some limitations; first: limitations due to data availability, only five-year data. Second: the research sample is composed of companies from different industries without considering the differences and specific characteristics across industries. Third: the results are limited to a single country, Egypt and cannot be generalized to other developing countries.

There is a deficiency of research validating, the importance of industry effects on companies' performance specifically in emerging economies (Matyjas, 2014). Therefore, future research may consider industry effects.

According to a review of literature conducted by Kumar, Colombage, and Rao (2017) that revealed the nonexistence of studies that covered the relationship of managerial characteristics such as age, education, experience, gender with capital structure. Therefore, this research suggests studying these characteristics relationships with the capital structure in future research. Moreover, small and medium-size companies (SMEs) are one of the major contributors to growth in developing countries. Thus, research examining the capital structure determinants of SMEs is a good future research. Furthermore, this research second the recommendation of El-Sayed Ebaid (2009) to study the joint impact of both capital structure and ownership structure on a company's performance.

REFERENCES

1. Abor, J. (2005). The effect of capital structure on profitability: An empirical analysis of listed firms in Ghana. *Journal of Risk Finance*, 6(5), 438-445. <https://doi.org/10.1108/15265940510633505>
2. Ahmad, N., & Abdul Rahim, F. (2013). Theoretical investigation on determinants of government-linked companies capital structure. *Journal of Accounting, Finance and Economics*, 3(2), 72-85. Retrieved from https://www.academia.edu/32132095/Theoretical_Investigation_on_Determinants_of_Government_Linked_Companies_Capital_Structure
3. Ahmed, N., & Afza, T. (2019). Capital structure, competitive intensity and firm performance: Evidence from Pakistan. *Journal of Advances in Management Research*, 16(5), 796-813. <https://doi.org/10.1108/JAMR-02-2019-0018>
4. Allini, A., Rakha, S., McMillan, D. G., & Caldarelli, A. (2018). Pecking order and market timing theory in emerging markets: The case of Egyptian firms. *Research in International Business and Finance*, 44, 297-308. <https://doi.org/10.1016/j.ribaf.2017.07.098>
5. Ardalan, K. (2017). Capital structure theory: Reconsidered. *Research in International Business and Finance*, 39(Part B), 696-710. <https://doi.org/10.1016/j.ribaf.2015.11.010>
6. Baker, M., & Wurgler, J. (2002). Market timing and capital structure. *Journal of Finance*, 57(1), 1-32. <https://doi.org/10.1111/1540-6261.00414>
7. Bandyopadhyay, A., & Barua, N. M. (2016). Factors determining capital structure and corporate performance in India: Studying the business cycle effects. *Quarterly Review of Economics and Finance*, 61, 160-172. <https://doi.org/10.1016/j.qref.2016.01.004>
8. Chakrabarti, A., & Chakrabarti, A. (2019). The capital structure puzzle - Evidence from Indian energy sector. *International Journal of Energy Sector Management*, 13(1), 2-23. <https://doi.org/10.1108/IJESM-03-2018-0001>
9. Chandra, T., Junaedi, A. T., Wijaya, E., Suharti, S., Mimelientesa, I., & Ng, M. (2019). The effect of capital structure on profitability and stock returns: Empirical analysis of firms listed in Kompas 100. *Journal of Chinese Economic and Foreign Trade Studies*, 12(2), 74-89. <https://doi.org/10.1108/jcefts-11-2018-0042>
10. Chi, C. W., Lieu, T. P., Hung, K., & Cheng, W. H. (2016). Do industry or firm effects drive performance in Taiwanese knowledge-intensive industries? *Asia Pacific Management Review*, 21(3), 170-179. <https://doi.org/10.1016/j.apmr.2016.05.001>
11. Chipeta, C., & Deressa, C. (2016). Firm and country specific determinants of capital structure in Sub Saharan Africa. *International Journal of Emerging Markets*, 11(4), 649-673. <https://doi.org/10.1108/IJoEM-04-2015-0082>
12. Dawar, V. (2014). Agency theory, capital structure and firm performance: Some Indian evidence. *Managerial Finance*, 40(12), 1190-1206. <https://doi.org/10.1108/MF-10-2013-0275>
13. Delmar, F., Davidsson, P., & Gartner, W. B. (2003). Arriving at the high-growth firm. *Journal of Business Venturing*, 18(2), 189-216. [https://doi.org/10.1016/S0883-9026\(02\)00080-0](https://doi.org/10.1016/S0883-9026(02)00080-0)
14. Eldomiaty, T. I. (2007). Determinants of corporate capital structure: Evidence from an emerging economy. *International Journal of Commerce and Management*, 17(1/2), 25-43. <https://doi.org/10.1108/10569210710774730>
15. El-Sayed Ebaid, I. (2009). The impact of capital-structure choice on firm performance: Empirical evidence from Egypt. *Journal of Risk Finance*, 10(5), 477-487. <https://doi.org/10.1108/15265940911001385>
16. Forte, R., & Tavares, J. M. (2019). The relationship between debt and a firm's performance: The impact of institutional factors. *Managerial Finance*, 45(9), 1272-1291. <https://doi.org/10.1108/MF-04-2018-0169>

17. Hamid, M. A., Abdullah, A., & Kamaruzzaman, N. A. (2015). Capital structure and profitability in family and non-family firms: Malaysian evidence. *Procedia Economics and Finance*, 31, 44-55. [https://doi.org/10.1016/s2212-5671\(15\)01130-2](https://doi.org/10.1016/s2212-5671(15)01130-2)
18. Jensen, M., & Meckling, W. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305-60. [https://doi.org/10.1016/0304-405X\(76\)90026-X](https://doi.org/10.1016/0304-405X(76)90026-X)
19. Kraus, A., & Litzenger, R. H. (1973). A state-preference model of optimal financial leverage. *The Journal of Finance*, 28(4), 911-922. <https://doi.org/10.1111/j.1540-6261.1973.tb01415.x>
20. Kumar, S., Colombage, S., & Rao, P. (2017). Research on capital structure determinants: A review and future directions. *International Journal of Managerial Finance*, 13(2), 106-132. <https://doi.org/10.1108/IJMF-09-2014-0135>
21. Kyissima, K. H., Xue, G. Z., Yapatake Kosselle, T. P., & Abeid, A. R. (2019). Analysis of capital structure stability of listed firms in China. *China Finance Review International*, 10(2), 213-228. <https://doi.org/10.1108/CFRI-05-2018-0044>
22. Le, T. P. V., & Phan, T. B. N. (2017). Capital structure and firm performance: Empirical evidence from a small transition country. *Research in International Business and Finance*, 42, 710-726. <https://doi.org/10.1016/j.ribaf.2017.07.012>
23. Li, L., & Islam, S. Z. (2019). Firm and industry specific determinants of capital structure: Evidence from the Australian market. *International Review of Economics and Finance*, 59, 425-437. <https://doi.org/10.1016/j.iref.2018.10.007>
24. Mangesti Rahayu, S., Suhadak, & Saifi, M. (2019). The reciprocal relationship between profitability and capital structure and its impacts on the corporate values of manufacturing companies in Indonesia. *International Journal of Productivity and Performance Management*, 69(2), 236-251. <https://doi.org/10.1108/IJPPM-05-2018-0196>
25. Matyjas, Z. (2014). Industry and firm influences on performance: Evidence from Polish public firms. *Journal of Management Policy and Practice*, 15(2), 88-96. Retrieved from http://www.digitalcommons.www.nabusinesspress.com/JMPP/MatyjasZ_Web15_2_.pdf
26. Modigliani, F., & Miller, M. (1958). The cost of capital, corporation finance and theory of investment. *The American Economic Review*, 48(3), 261-297. Retrieved from <https://www.jstor.org/stable/1809766>
27. Modigliani, F., & Miller, M. H. (1963). Corporate income taxes and the cost of capital: A correction. *American Economic Review*, 53(3), 433-443. Retrieved from <https://epge.fgv.br/we/MFEE/FinancasCorporativas/2012?action=AttachFile&do=get&target=Paper8.pdf>
28. Moradi, A., & Paulet, E. (2019). The firm-specific determinants of capital structure - An empirical analysis of firms before and during the Euro Crisis. *Research in International Business and Finance*, 47, 150-161. <https://doi.org/10.1016/j.ribaf.2018.07.007>
29. Myers, S. C. (1984). The capital structure puzzle. *Journal of Finance*, 39(3), 575-592. <https://doi.org/10.2307/2327916>
30. Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information the investors do not have. *Journal of Financial Economics* 13, 187-221. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.334.7154&rep=rep1&type=pdf>
31. Obay, L. A. (2018). The capital structure choice: Evidence of debt maturity substitution by GCC firms. *Asian Economic and Financial Review*, 8(11), 1298-1312. <https://doi.org/10.18488/journal.aefr.2018.811.1298.1312>
32. Olaniyi, T. A., Elelu, M. O., & Abdulsalam, T. S. (2015). Impact of capital structure on corporate performance: A pre and post crisis evaluation of selected companies in US. *International Journal of Accounting Research*, 2(8), 1-20. <https://doi.org/10.12816/0017352>
33. Omran, M. M., & Pointon, J. (2009). Capital structure and firm characteristics: An empirical analysis from Egypt. *Review of Accounting and Finance*, 8(4), 454-474. <https://doi.org/10.1108/14757700911006976>
34. Ooi, J. (1999). The determinants of capital structure Evidence on UK property companies. *Journal of Property Investment & Finance*, 17(5), 464-480. <https://doi.org/10.1108/14635789910294886>
35. Park, H. M. (2011). *Practical guides to panel data modeling: A step by step analysis using stata* (Tutorial Working Paper, Graduate School of International Relations, International University of Japan). Retrieved from https://www.academia.edu/28505133/Practical_Guides_To_Panel_Data_Modeling_A_Step_by_Step
36. Pillai, V. (2016). *Panel data analysis with stata part 1 fixed effects and random effects models* (MPRA Paper No. 76869, pp. 1-56). Retrieved from <https://mpa.ub.uni-muenchen.de/76869/>
37. Pouraghajan, A., Malekian, E., Emamgholipour, M., Lotfollahpour, V., & Bagheri, M. M. (2012). The relationship between capital structure and firm performance: Evidence from Jordan. *International Journal of Business and Commerce*, 1(9), 166-181. Retrieved from <https://ijbcnet.com/1-9/IJBC-12-1915.pdf>
38. Sakr, A., & Bedeir, A. (2019). Firm level determinants of capital structure: Evidence from Egypt. *International Journal of Financial Research*, 10(1), 68-87. <https://doi.org/10.5430/ijfr.v10n1p68>
39. Salim, M., & Yadav, R. (2012). Capital structure and firm performance: Evidence from Malaysian listed companies. *Procedia - Social and Behavioral Sciences*, 65, 156-166. <https://doi.org/10.1016/j.sbspro.2012.11.105>
40. Shambor, A. Y. (2017). The determinants of capital structure: Empirical analysis of oil and gas firms during 2000-2015. *Asian Journal of Finance & Accounting*, 9(1), 1-34. <https://doi.org/10.5296/ajfa.v9i1.9359>
41. Singh, N. P., & Bagga, M. (2019). The effect of capital structure on profitability: An empirical panel data study. *Jindal Journal of Business Research*, 8(1), 65-77. <https://doi.org/10.1177/2278682118823312>
42. The Egyptian Exchange. (2014). *Annual Report (2014)*. Retrieved from https://www.egx.com.eg/en/Services_Reports.aspx
43. The Egyptian Exchange. (2015). *Annual Report (2015)*. Retrieved from https://www.egx.com.eg/en/Services_Reports.aspx
44. The Egyptian Exchange. (2016). *Annual Report (2016)*. Retrieved from https://www.egx.com.eg/en/Services_Reports.aspx
45. Tifow, A. A., & Sayilir, O. (2015). Capital structure and firm performance: An analysis of manufacturing firms in Turkey. *Eurasian Journal of Business and Management*, 3(4), 13-22. <https://doi.org/10.15604/ejbm.2015.03.04.002>
46. Vătavu, S. (2015). The impact of capital structure on financial performance in Romanian listed companies. *Procedia Economics and Finance*, 32, 1314-1322. [https://doi.org/10.1016/s2212-5671\(15\)01508-7](https://doi.org/10.1016/s2212-5671(15)01508-7)
47. Wahba, H. (2014). Capital structure, managerial ownership and firm performance: Evidence from Egypt. *Journal of Management and Governance*, 18, 1041-1061. <https://doi.org/10.1007/s10997-013-9271-8>
48. Weill, L. (2008). Leverage and corporate performance: Does institutional environment matter? *Small Business Economics*, 30, 251-265. <https://doi.org/10.1007/s11187-006-9045-7>
49. Yazdanfar, D., & Öhman, P. (2015). Debt financing and firm performance: An empirical study based on Swedish data. *Journal of Risk Finance*, 16(1), 102-118. <https://doi.org/10.1108/JRF-06-2014-0085>

50. Yazdanfar, D., Öhman, P., & Homayoun, S. (2019). Financial crisis and SME capital structure: Swedish empirical evidence. *Journal of Economic Studies*, 46(4), 925-941. <https://doi.org/10.1108/JES-04-2018-0147>
51. Youssef, A., & El-ghonamie, A. (2015). Factors that determine capital structure in building material and construction listed firms: Egypt case. *International Journal of Financial Research*, 6(4), 46-59. <https://doi.org/10.5430/ijfr.v6n4p46>
52. Zeitun, R., & Saleh, A. S. (2015). Dynamic performance, financial leverage and financial crisis: Evidence from GCC countries. *EuroMed Journal of Business*, 10(2), 147-162. <https://doi.org/10.1108/EMJB-08-2014-0022>

APPENDIX

Table A.1. EPS: Random-effects model

Random-effects GLS regression	Number of obs	=	777
Group variable: company1	Number of groups	=	168
R-sq: within = 0.0216	Obs per group: min	=	1
between = 0.0148	avg	=	4.6
overall = 0.0192	max	=	5
corr(u_i, X) = 0 (assumed)	Wald chi2(4)	=	13.08
	Prob > chi2	=	0.0109

EPS	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
STDTA	-6.321797	1.883183	-3.36	0.001	-10.01277	-2.630826
LTDTA	-2.29877	1.597117	-1.44	0.150	-5.429061	.8315219
lnTA	-.0744037	.1979851	-0.38	0.707	-.4624474	.31364
Growth	-.0008022	.0092139	-0.09	0.931	-.0188611	.0172568
_cons	2.245353	1.160359	1.94	0.053	-.028908	4.519614
sigma_u	3.2307673					
sigma_e	3.972506					
rho	.39810795	(fraction of variance due to u_i)				

Table A.2. Output (ROA): Fixed-effects model

Fixed-effects (within) regression	Number of obs	=	772
Group variable: company1	Number of groups	=	168
R-sq: within = 0.2041	Obs per group: min	=	1
between = 0.1875	avg	=	4.6
overall = 0.2153	max	=	5
corr(u_i, Xb) = -0.2549	F(4,600)	=	38.46
	Prob > F	=	0.0000

ROA	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
STDTA	-.523397	.0448071	-11.68	0.000	-.6113947	-.4353993
LTDTA	-.1563003	.0317568	-4.92	0.000	-.2186683	-.0939324
lnTA	.0000516	.0031932	0.02	0.987	-.0062195	.0063228
Growth	.0000271	.0001318	0.21	0.837	-.0002317	.000286
_cons	.0930148	.018411	5.05	0.000	.056857	.1291727
sigma_u	.08891778					
sigma_e	.05390449					
rho	.73125449	(fraction of variance due to u_i)				

F test that all u_i=0: F(167, 600) = 10.53 Prob > F = 0.0000

