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AN EMPIRICAL STUDY ON EGYPTIAN FIRMS FROM 2010 T0 2021

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Abstract

The purpose of this study is to carry out empirical testing, using panel data methodology for the period of 2010 to 2021 using data of nun financial organizations in EGX30 with 228 observations, to examine the impact of firm's characteristics and Macro on the corporate capital structure decisions of Egyptian firms.

This study deploys five independent variables that represent firm's characteristics - tangibility of assets, profitability, growth Opportunities, size, and Liquidity. In addition to five moderating variables that represent country's specific factors- net foreign direct investment, nominal gross domestic product, interest rate corridor, inflation and Brent crude oil prices,

the results indicate that liquidity, profitability and tangibility are important determinants of capital structure with negative effect on leverage on other hand the size has significant positive effect on leverage. And no significant relation between growth opportunity and leverage

The study reveals that GDP has moderation effect on the relation between liquidity and the leverage and no moderation effect on the tangibility, size, profitability margin, and growth opportunity with leverage.

FDI is found to have a significant moderating effect on the relationship between tangibility, profitability margin, liquidity, and growth opportunity with leverage. FDI does not significantly moderate the relationship between Size and leverage.

The inflation rate does not significantly moderate the relations with any of the micro and Leverage
Interest rate is found to have a significant moderating effect on the relationship between, profitability margin and liquidity with leverage. And found no significant moderating effect on the relationship between size, tangibility and growth opportunity with leverage
Brent Crude does not significantly moderate the relationship between Tangibility, Size, and Profitability margin with leverage, it does moderate the relationship between Liquidity and leverage, as well as the relationship between Growth Opportunity and leverage.

Keywords: Capital Structure mix, Capital Structure, Financial Structure, Leverage, Capital structure theories, Firm's characteristics, Macro-economic variables, Micro economic variables, pecking order theory, Trade off theory, Information asymmetry, Agency theory, corporate governance, Credit rating, Capital structure in developing countries, Capital structure in developed countries, Investment decision

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1. Introduction

The development of capital structure studies can be traced back to the late 1950s and early 1960s when researchers began to explore the relationship between firm financing decisions and its value. The seminal study in this area is considered to be the Modigliani and Miller (MM) theorem.

In 1958, Franco Modigliani and Merton Miller published a paper titled "The Cost of Capital, Corporation Finance, and the Theory of Investment," which laid the foundation for modern capital structure theory. They argued that, under certain assumptions, the capital structure of a firm is irrelevant in determining its value. According to MM, in a perfect market with no taxes, no transaction costs, and no information asymmetry, the value of a firm is determined solely by its cash flows and the riskiness of its investments.

This work spurred a flurry of research in the following decades, with scholars attempting to refine and expand upon the MM theorem. Researchers considered various factors that might influence a firm's optimal capital

structure, such as taxes, bankruptcy costs, agency costs, and information asymmetry.

One of the most influential extensions of the MM theorem was the introduction of the trade-off theory of capital structure. Proposed by Stewart Myers in 1977, the trade-off theory suggests that firms have an optimal capital structure that balances the tax benefits of debt with the costs of financial distress. Under this framework, firms choose an optimal level of debt that maximizes their value.

Another important development in capital structure studies was the pecking order theory, proposed by Myers and Majluf (1984). This theory suggests that firms prioritize their sources of financing, with internal funds being the preferred choice, followed by debt, and finally equity. According to the pecking order theory, firms resort to debt or equity issuance only when internal funds are insufficient. This theory implies that firms' capital structure is largely determined by their financing needs, rather than specific target debt-to-equity ratios.

In recent years, researchers have also explored the role of market timing in firms' capital structure decisions. Market timing theory suggests that firms tend to issue equity when stock prices are high and repurchase shares when prices are low. This behavior reflects firms' attempts to take advantage of favorable market conditions to optimize their capital structure.

Overall, the development of capital structure studies has significantly advanced our understanding of how firms make financing choices and how these decisions impact firm value. Researchers continue to explore this area, considering new factors and refining existing theories to provide more insights into firms' capital structure decisions

1.2 PROBLEM DIFINATION

To reach to the optimal mix of debt and equity that maximizing the return on the company's value, which leads to expansion, increasing the state's tax revenue, and adding many job opportunities to Egypt economy

1.3 RESEARCH OBJECTIVES

This study aims to identify how business factors, such as profitability, growth potential, size, and liquidity, affect the capital structure of Egyptian companies that are listed on the Egypt Exchange (EGX30) to 2010 through 2021 Additionally, it makes an effort to understand how some national characteristics, including as net foreign direct investment (FDI), nominal growth domestic product (GDP), the interest rate corridor, the inflation rate, and Brent crude oil prices, may affect the capital structure decision .

1.4 CONCEPTUAL FRAMEWORK

The conceptual framework under study is shown in **figure 1** and consists of the following dependent and independent and variables:

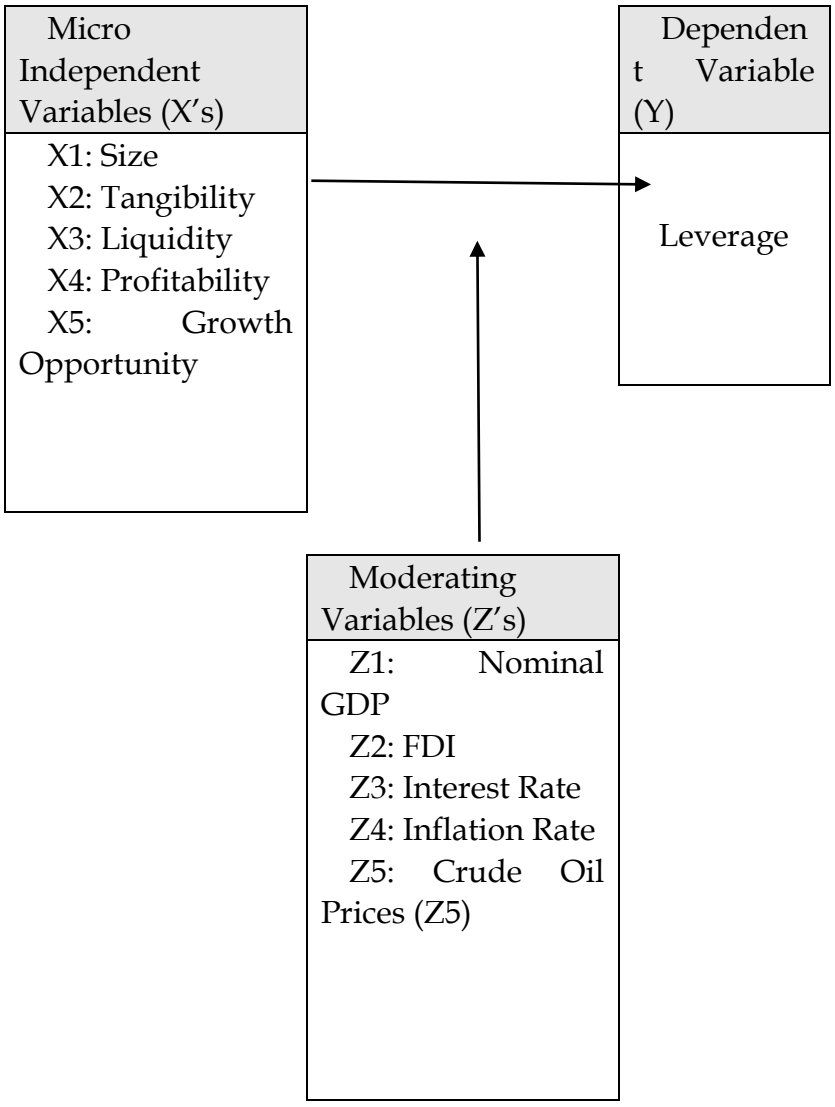

Figure1: TheConceptual Framework

1.4.1 Research Limitations

L1: The research is conducted on 19 companies after eliminate the financial institutions according the special financing for them and also other companies that join the EGX 30 from years less than 12 years that the research covered

1.5 WHAT ARE THE MAIOR RESEARCH QUESTIONS & HAPOTHESIS

1.5.1 Major Research Question

What is the impact of the micro variables demonstrated in firm's characteristics on the capital structure for EGX30 companies?

1.5.2 Mainor Research Questions

- What is the relationship between tangibility of the assets and the capital structure for EGX30 companies?

- What is the relationship between profitability and the capital structure for EGX30 companies?
  What is the relationship between growth opportunities and the capital structure for EGX30 companies?
  What is the relationship between size and the capital structure for EGX30 companies?
  What is the relationship between earning volatility and the capital structure for EGX30 companies?

- To what extent FDI could moderate the relationship between the independent variables
  and the capital structure for EGX30 companies?

- To what extent GDP could moderate the relationship between the independent variables and the capital structure for EGX30 companies?

- To what extent interest rate corridor could moderate the relationship between the independent variables and the capital structure for EGX30 companies?

- To what extent inflation rate could moderate the relationship between the independent variables and the capital structure for EGX30 companies?

- To what extent Brent-crude oil prices could moderate the relationship between the independent variables and the capital structure for EGX30 companies?

LITREATURE REVIEW

2.CAPITAL STRUCTURE Theories

This literature review aims to provide an overview of the various factors that influence a firm's capital structure decisions. It explores empirical studies and theoretical frameworks that have examined factors such as profitability, asset structure, firm size, growth opportunities, taxation, bankruptcy costs, agency problems, and market conditions. The review identifies key findings, discusses areas of agreement and disagreement among researchers, and suggests avenues for future research.

The development of capital structure studies can be traced back to the late 1950s and early 1960s when researchers began to explore the relationship between firm financing decisions and its value. The seminal study in this area is considered to be the Modigliani and Miller (MM) theorem.

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capital structure, such as taxes, bankruptcy costs, agency costs, and information asymmetry.

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In recent years, researchers have also explored the role of market timing in firms' capital structure decisions. Market timing theory suggests that firms tend to issue equity when stock prices are high and repurchase shares when prices are low. This behavior reflects firms' attempts to take advantage of favorable market conditions to optimize their capital structure.

Overall, the development of capital structure studies has significantly advanced our understanding of how firms make financing choices and how these decisions impact firm value. Researchers continue to explore this area, considering new factors and refining existing theories to provide more insights into firms' capital structure decisions.

2.1. Dependent Variables

- DEP VAR (Y): Financial Leverage

Financial leverage refers to the use of borrowed funds (debt) to finance the acquisition of assets or investments. It involves utilizing debt to amplify the potential returns of an investment or business operation. This concept is often measured by the ratio of debt to equity in a company's capital structure.

2.2 Independent Variables (X's)

The independent factors utilized in this study are tangibility of assets, profitability, expansion potential, size, and liquidity, which have been shown in several studies to be important

2.3 Moderating Variables (*Z*'s)

As demonstrated above, the moderating variable under this study are FDI, GDP, interest rate corridor, inflation rate and Brent-crude oil prices

3.Research Methodology

3.1 Research Design

The purpose of a research design is to provide a logical arrangement that guides the collection and investigation of data to answer the previously stated research questions. A research design is a comprehensive plan for conducting a research study that operationalizes variables so that they can be measured, collects data to test hypotheses, and evaluates the outcomes. This will help the researcher choose the most appropriate and relevant approach for this study. The relevant issues required for the design of the research process are evaluated and are arranged into as follows: the measurement of the dependent variables (capital structure), and the independent variables (firm-specific factors, industry-specific factors, and country-specific factors). Then we will discuss the sample selection and data-collection process.

Several studies have examined the concept of capital structure, highlighting the need for appropriate measures to empirically analyze its determinants. Traditionally, three leverage measures have been used to express capital structure: total debt to total assets, long-term debt to total assets, and short-term debt to total assets (Modigliani & Miller, 1958; Booth et al., 2001; Shumway, 2001; Fama and French, 2002; Chung, 1993; Colombo, 2001; Bevan and Danbolt, 2002).

As evident in the previous review of the literature, many academic and professional observers have extensively examined the extent to which capital structure is affected by firms' characteristic, Cespedes, et al. (2008), Bebczuk and Galindo (2010), Achy (2009), Murray and Vidhan (2009). While, others have devoted their effort to address the influence of country's specific factors on capital structure Gajurel (2006) Mahmud, et al. (2009), Bas, et al. (2009) and de Jong et al. (2007).

In this research, the researcher adapts some of those variables that have repeatedly and systematically confirmed to greatly influence the capital structure, in which the dependent variable is the capital structure EGX 30 companies. Firm's characteristics are the independent variables, and country's specific factors are the moderating variables that expected to moderate the relationship between the dependent variable (capital structure) and the independent variables (micro determinates factors).

In this particular study, the researcher follows the approach of Ferri and Jones (1979) by using financial leverage as the measure of capital structure, which is defined as the ratio of total debt to total assets. Due to data limitations, the researcher adopts the use of book values instead of market values when measuring leverage, in line with Titman and Wessels (1988).

3.2 Population and Sample

The population is the audited financial statements for the Egyptian firms traded in Egyptian Exchange (EGX) in Cairo A sample of audited financial of entire thirty companies that are traded in Egyptian Exchange (EGX30), that represent the majority of sectors in the Egyptian market. However, Data on financial companies are not included as these companies are totally different from non-financial companies

Data was compared across the 19 companies from 2010 to 2021. Both a longitudinal and cross-sectional analysis of the listed EGX30 companies were done hence constituting panel data analysis. The data that was utilized for this research was secondary data and an archival research strategy was applied. The data spans the period from 2010-2020 as the availability of data. The samples of companies are selected based on the accessibility of data.

3.3 Empirical Research Models and Hypotheses

Six models are developed to test the research hypothesis. The research is separated into six models mainly due to investigate the effect of micro independent variables and effect of the moderator variables separately. By using six separate models in this research, we will be able to examine the effect of each of micro and macro determinates on capital structure separately. The first model will focus only on micro independent variables, the second model will focus on the industry-specific attributes, and the other five model will focus on effect of micro independent variables on leverage if it is moderated by one of the macro variables, separately. Each model will be regressed twice, one against total debt to total assets as a dependent variable

and another one against short-term debt to total assets as a dependent variable.

Hence, the practical models with the main variables of the research are formed as follows:

3.3.1 First Model

The first empirical model investigates the impact of micro factors on capital structure. The data collected shall was subjected to correlation analysis and Panel data analysis. Panel data analysis was incorporated in the data analysis stage.

$$Y_{it} = \alpha_{it} + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + U_{it}$$

Table 3.1: Micro determinants Hypotheses

Micro determinants Hypotheses	
H1-1	There is a positive relationship between size and leverage
H1-2	There is a positive relationship between tangibility and leverage
H1-3	There is a negative relationship between liquidity and leverage.
H1-4	There is a negative relationship between firms' profitability and leverage.
H1-5	There is a negative relationship between growth opportunities and leverage.

3.3.2 Second Model (GDP Moderator)

The second empirical model investigates to what extent GDP moderates the relationship between the independent variables and the leverage. Panel data analysis was incorporated in the data analysis stage and interaction term was created as effect of moderation.

$$Y_{it} = \alpha_{it} + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + \beta_6 Z_{1it} + \beta_7 X_{1it} Z_{1it} + \beta_8 X_{2it} Z_{1it} + \beta_9 X_{3it} Z_{1it} + \beta_{10} X_{4it} Z_{1it} + \beta_{11} X_{5it} Z_{1it} + U_{it}$$

Six main hypotheses will be formulated and tested. Table 3.7 shows these five statements.

Table 3.2: GDP Moderator Hypotheses

GDP Moderator Hypotheses	
H2-1	There is a relationship between GDP and leverage.
H2-2	There is a relationship between size and leverage is moderated by GDP
H2-3	There is a relationship between tangibility and leverage is moderated by GDP
H2-4	There is a relationship between liquidity and leverage is moderated by GDP
H2-5	There is a relationship between firms' profitability and leverage is moderated by GDP
H2-6	There is a negative relationship between growth opportunities and leverage is moderated by GDP

3.3.3 Third Model (FDI Moderator)

The third empirical model investigates to what extent FDI moderates the relationship between the independent variables and the leverage. Panel data analysis was incorporated in the data analysis stage and interaction term was created as an effect of moderation.

$$Y_{it} = \alpha_{it} + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + \beta_6 Z_{2it} + \beta_7 X_{1it} Z_{2it} + \beta_8 X_{2it} Z_{2it} + \beta_9 X_{3it} Z_{2it} + \beta_{10} X_{4it} Z_{2it} + \beta_{11} X_{5it} Z_{2it} + U_{it}$$

Table 3.3: FDI Moderator Hypotheses

FDP Moderator Hypotheses	
H3-1	There is a relationship between FDI and leverage.
H3-2	There is a relationship between size and leverage is moderated by FDI
H3-3	There is a relationship between tangibility and leverage is moderated by FDI
H3-4	There is a relationship between liquidity and leverage is moderated by FDI

H3-5	There is a relationship between firms' profitability and leverage is moderated by FDI
H3-6	There is a negative relationship between growth opportunities and leverage is moderated by FDI

3.3.4 Fourth Model (Interest Rate Moderator)

The fourth empirical model investigates to what extent interest rate moderates the relationship between the independent variables and the leverage. Panel data analysis was incorporated in the data analysis stage and interaction term was created as an effect of moderation.

$$Y_{it} = \alpha_{it} + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + \beta_6 Z_{3it} + \beta_7 X_{1it} Z_{3it} + \beta_8 X_{2it} Z_{3it} + \beta_9 X_{3it} Z_{3it} + \beta_{10} X_{4it} Z_{3it} + \beta_{11} X_{5it} Z_{3it} + U_{it}$$

Table 3.4: Interest Rate Moderator Hypotheses

Interest Rate Moderator Hypotheses	
H4-1	There is a relationship between Interest rate and leverage.
H4-2	There is a relationship between size and leverage is moderated by Interest rate
H4-3	There is a relationship between tangibility and leverage is moderated by Interest rate
H4-4	There is a relationship between liquidity and leverage is moderated by Interest rate
H4-5	There is a relationship between firms' profitability and leverage is moderated by Interest rate
H4-6	There is a negative relationship between growth opportunities and leverage is moderated by Interest rate

3.3.5 Fifth Model (Inflation Rate Moderator)

The fifth empirical model investigates to what extent

inflation rate moderates the relationship between the independent variables and the leverage. Panel data analysis was incorporated in the data analysis stage and interaction term was created as an effect of inflation rate moderation.

$$Y_{it} = \alpha_{it} + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + \beta_6 Z_{4it} + \beta_7 X_{1it} Z_{4it} + \beta_8 X_{2it} Z_{4it} + \beta_9 X_{3it} Z_{4it} + \beta_{10} X_{4it} Z_{4it} + \beta_{11} X_{5it} Z_{4it} + U_{it}$$

Table 3.5: Inflation Rate Moderator Hypotheses

inflation Rate Moderator Hypotheses	
H5-1	There is a relationship between inflation rate and leverage.
H5-2	There is a relationship between size and leverage is moderated by inflation rate
H5-3	There is a relationship between tangibility and leverage is moderated by inflation rate
H5-4	There is a relationship between liquidity and leverage is moderated by inflation rate
H5-5	There is a relationship between firms' profitability and leverage is moderated by inflation rate
H5-6	There is a negative relationship between growth opportunities and leverage is moderated by inflation rate

3.3.6 Sixth Model (Brent - Crude Oil Prices Moderator)

The fifth empirical model investigates to what extent Brent-crude oil prices moderate the relationship between the independent variables and the leverage. Panel data analysis was incorporated in the data analysis stage and interaction term was created as an effect of Brent-crude oil prices moderation.

$$Y_{it} = \alpha_{it} + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + \beta_6 Z_{5it} + \beta_7 X_{1it} Z_{5it} + \beta_8 X_{2it} Z_{5it} + \beta_9 X_{3it} Z_{5it} + \beta_{10} X_{4it} Z_{5it} + \beta_{11} X_{5it} Z_{5it} + U_{it}$$

Table3.6: Brent-Crude Oil Prices Moderator Hypotheses

Brent-Crude Oil Prices Hypotheses	
H6-1	There is a relationship between Brent-crude oil prices and leverage.
H6-2	There is a relationship between size and leverage is moderated by Brent-crude oil prices
H6-3	There is a relationship between tangibility and leverage is moderated by Brent-crude oil prices e

H6-4	There is a relationship between liquidity and leverage is moderated by Brent-crude oil prices
H6-5	There is a relationship between firms' profitability and leverage is moderated by Brent-crude oil prices
H6-6	There is a negative relationship between growth opportunities and leverage is moderated by Brent-crude oil prices

3.4 Panel Data Analysis

The data collected shall was subjected to correlation analysis and Panel data analysis. The analysis was done using both descriptive and inferential frameworks. We employ a panel data model to estimate the relationship between the dependent variable (capital structure) and the independent variables identified in section 3.2.

Panel data, also known as longitudinal or cross-sectional time-series data, combines both cross-sectional and time-series dimensions in a dataset. It consists of observations on multiple entities (such as firms) over multiple time periods. Panel data analysis is a statistical method that allows for the examination of both individual and time-related variations, making it well-suited for studying the determinants of capital structure in Egyptian firms. It offers numerous advantages over cross-sectional and time-series data, including the ability to control for individual heterogeneity, provide more informative and varied data, capture dynamics and adjustment processes, detect effects that may be missed in other approaches, accommodate complex behavioral models, and ensure accurate measurements at the micro-level. Panel data analysis was incorporated in the data analysis stage. Analysis of this study was done based on the model for which the micro and macro macroeconomic factors were analyzed as presented in section (3.4). The dataset selected for analysis in this study consists of 'micro panel data' characterized by a large number of cross-sections (N=19)

and a small time series length (T=12). By utilizing panel data in this study, we can effectively analyze data from different companies over a twelve-year period, while accounting for unobservable variables such as company policies and business practices. The method of panel data analysis to be considered is fixed effects after testing

The main purpose of Fixed Effects models is to control time-invariant characteristics that are specific to each firm. This model helps us control firm-specific characteristics that remain constant over time and might affect financial performance.

The Fixed Effects model is suitable because it recognizes that certain internal factors within a firm can have a significant impact on its financial performance. By accounting for these factors, we can accurately assess the

net effect of independent variables on capital structure (Wooldridge, 2003). Another important assumption of the Fixed Effects model is that the firm-specific characteristics that we're considering are unique to each firm and don't correlate with the characteristics of other firms in our sample. This assumption acknowledges the individuality of each firm and ensures that our analysis remains valid.

4.DATA ANALYSIS, FINDINGS AND DISCUSSION

4.1 Panel Data Analysis

In order to estimate the impact of capital structure on firm's performance, we use data obtained from EGX 30 listed non-financial firms in Egypt for the period 2010 to 2021. The initial data set is a balanced panel of 19 companies and 228 observations. To analyze the effect of firm-specific determinants on the capital structure of the firm panel data analysis is employed. Different models will be discussed. The first model is to use regression analysis for micron independent variables and other models investigate the effect of macro variables in moderating relation between leverage and micro independent variables.

Table 4.1: Fixed Effects (FE) Regression and FGLS method (Dependent Variable: Lev)

Independent variables	**Fixed effect model**				**FGLS model**			
	Coefficient	**S.e.**	**t-Stat.**	***p-value***	**Coefficient**	**S.e.**	**t-Stat.**	***p-value***
Intercept	-0.669	0.168	-3.98	< .001	.407	.029	14.27	< .001
Tangibility	0.070	0.056	1.26	.209	-.198	.019	-10.53	< .001

Size	0.135	0.018	7.31	< .001	.032	.003	10.74	< .001
Profitability margin	-0.003	0.004	-0.89	.374	-.004	.001	-3.55	< .001
Liquidity	-0.032	0.004	-7.97	< .001	-.016	.001	-18.34	< .001
Growth Opportunity	0.001	0.007	0.16	.872	.001	.001	0.48	.631
Overall test	F (11, 11) = 5944.49, *p-value* < .001				Wald χ^2 = 708.96, *p-value* < .001			
No. of obs.	**228**				**228**			

4.2Moderation analysis

Table 4.2: Fixed Effects (FE) Regression and FGLS model including GDP Moderator

Independent variables	**Fixed effect model**				**FGLS model**			
	Coefficient	**S.e.**	**t-Stat.**	***p-value***	**Coefficient**	**S.e.**	**t-Stat.**	***p-value***
Intercept	-0.265	.418	-0.63	.534	0.6465	0.0207	31.3	<.001
Tangibility	0.207	.224	0.92	.369	-0.1207	0.0145	-8.3	<.001
Size	0.107	.041	2.58	.019*	0.0128	0.0020	6.32	<.001
Profitability margin	-0.097	.074	-1.32	.202	-0.0056	0.0010	-5.8	<.001
Liquidity	-0.054	.034	-1.61	.124	-0.0149	0.0012	-12.48	<.001
Growth Opportunity	-0.07	.061	-1.14	.268	0.0004	0.0016	0.23	0.82
GDP	-0.001	.001	-0.60	.558	-0.0004	0.0005	-8.33	<.001
Tangibility*GDP	-0.001	.001	-0.79	.44	-0.0010	0.000408	-2.42	0.015
Size*GDP	0.0	0	0.09	.933	0.0001	.000394	2.28	0.023

Profitability margin*GDP	0	0	1.27	.221	-0.0001	0.000115	-0.96	0.338
Liquidity *GDP	0	0	0.75	.464	0.0001	0.000258	3.29	0.001
Growth Opportunity *GDP	0	0	1.12	.276	-0.0001	0.000134	-0.68	0.495
Overall F -test	F (11, 11) = 544.49, *p-value* < .001				**Wald chi2(11) = 357.30**			
No. of obs.	**228**				**228**			

4.3 Net foreign direct investment (FDI) Moderator

Table 4.3: Fixed Effects (FE) Regression and FGLS model including FDI Moderator

Independent variables	**Fixed effect model**				**FGLS model**			
	Coefficient	**S.e.**	**t-Stat.**	***p-value***	**Coefficient**	**S.e.**	**t-Stat.**	***p-value***
Intercept	**-0.159**	**0.243**	**-0.65**	**0.515**	**0.406**	**0.045**	**9.040**	**< .001**
Tangibility	**0.108**	**0.092**	**1.170**	**0.244**	**-0.082**	**0.014**	**-6.060**	**< .001**
Size	**0.085**	**0.025**	**3.380**	**0.001**	**0.011**	**0.005**	**2.110**	**0.035**
Profitability margin	**-0.105**	**0.033**	**-3.170**	**0.002**	**-0.059**	**0.009**	**-6.830**	**< .001**
Liquidity	**-0.041**	**0.009**	**-4.340**	**< .001**	**-0.024**	**0.004**	**-6.440**	**< .001**
Growth Opportunity	**0.053**	**0.067**	**0.800**	**0.427**	**0.130**	**0.016**	**7.960**	**< .001**
FDI	**0.018**	**0.017**	**1.070**	**0.287**	**0.020**	**0.007**	**2.870**	**0.004**
Tangibility* FDI	**-0.007**	**0.012**	**-0.630**	**0.527**	**-0.005**	**0.002**	**-2.330**	**0.020**
Size*FDI	**-0.003**	**0.002**	**-1.680**	**0.094**	**-0.001**	**0.001**	**-1.430**	**0.153**
Profitability margin*	**0.012**	**0.004**	**3.160**	**0.002**	**0.007**	**0.001**	**6.730**	**< .001**

FDI								
Liquidity * FDI	**0.002**	**0.002**	**1.080**	**0.282**	**0.001**	**0.001**	**2.190**	**0.028**
Growth Opportunity * FDI	**-0.007**	**0.008**	**-0.820**	**0.416**	**-0.016**	**0.002**	**-7.860**	**< .001**
Overall F -test	**F (11, 198) = 14.95, *p-value* < .001**				**Wald chi2(11) = 1302.57**			
No. of obs.	**228**				**228**			

4.4 Inflation Rate Moderator

Table 4.4: Fixed Effects (FE) Regression and FGLS model including Inflation Rate Moderator

	Fixed effect model				**FGLS model**			
	Coefficient	**S.e.**	**t-Stat.**	*p-value*	**Coefficient**	**S.e.**	**t-Stat.**	*p-value*
Intercept	-0.776	0.184	-4.220	< .001	0.6763	0.0666	10.150	< .001
Tangibility	0.0218	0.0691	0.3100	0.7530	-0.2136	0.0427	-5.010	< .001
Size	0.1467	0.0201	7.3000	0.0000	0.0125	0.0074	1.690	0.091
Profitability margin	0.0025	0.0173	0.1500	0.8840	-0.0138	0.0103	-1.340	0.180
Liquidity	-0.0308	0.0091	-3.390	0.0010	-0.0272	0.0071	-3.810	< .001
Growth Opportunity	0.0171	0.0288	0.5900	0.5530	-0.0160	0.0183	-0.870	0.382
Inflation Rate	0.0085	0.0062	1.3600	0.1750	-0.0103	0.0037	-2.780	0.005
Tangibility* Inflation Rate	0.0044	0.0042	1.0500	0.2950	0.0100	0.0023	4.340	< .001
Size* Inflation Rate	-0.0010	0.0006	-1.540	0.1260	0.0006	0.0003	1.640	0.100
Profitability margin* Inflation Rate	-0.0012	0.0031	-0.370	0.7080	0.0010	0.0017	0.570	0.569
Liquidity * Inflation Rate	-0.0002	0.0008	-0.210	0.8340	0.0003	0.0007	0.500	0.618
Growth Opportunity *Inflation Rate	-0.0010	0.0019	-0.560	0.5760	0.0008	0.0012	0.670	0.506
Overall F -test	F (11, 198) = 14.95, *p-value* < .001				**Wald chi2(11) = 319.14**			
No. of obs.	**228**				**228**			

4.5 Interest Rate Moderator

Table 4.5: Fixed Effects (FE) Regression and FGLS model including Interest Rate Moderator

Independent variables	Fixed effect model				FGLS model			
	Coefficient	S.e.	t-Stat.	*p-value*	Coefficient	S.e.	t-Stat.	*p-value*
Intercept	-0.5331	0.2414	-2.21	0.028	0.4609	0.0613	7.52	< .001
Tangibility	0.1565	0.1014	1.54	0.124	-0.0490	0.0460	-1.06	0.287
Size	0.1151	0.0266	4.32	< .001	0.0229	0.0057	3.99	0.000
Profitability margin	0.1168	0.0525	2.22	0.027	0.0627	0.0184	3.41	0.001
Liquidity	-0.0404	0.0174	-2.32	0.021	-0.0382	0.0061	-6.29	< .001
Growth Opportunity	-0.0175	0.0547	-0.32	0.750	-0.0637	0.0107	-5.93	< .001
Brent Crude	-0.0004	0.0015	-0.3	0.765	-0.0014	0.0006	-2.22	0.026
Tangibility* Brent Crude	-0.0005	0.0010	-0.5	0.616	-0.0008	0.0006	-1.22	0.224
Size* Brent Crude	0.0001	0.0001	0.65	0.515	0.0001	0.0001	0.89	0.375
Profitability margin* Brent Crude	-0.0017	0.0008	-2.27	0.025	-0.0009	0.0003	-3.56	< .001
Liquidity * Brent Crude	0.0001	0.0002	0.46	0.648	0.0003	0.0001	3.84	< .001
Growth Opportunity * Brent Crude	0.0003	0.0008	0.35	0.728	0.0009	0.0001	5.89	< .001
Overall F -test	F (11, 198) = 12.50, *p-value* < .001				Wald chi2(11) = 477.86			
No. of obs.	228				228			

In the FGLS model, we examined the moderating effect of Interest Rate on the relationship between independent variables and leverage as in table

4.6 Brent crude

Table 4.6: Fixed Effects (FE) Regression and FGLS model including Brent Crude Moderator

CONCLUSION, RECOMMENDATIONS AN FUTURE RESEARCH.

5.1 CONCLUSION

There are various factors that can impact a company's capital structure. In this essay, we have discussed several key factors, including profitability, Size, growth opportunities, liquidity and Tangibility as the independent variables. And as moderators oil price, interest rate, inflation, direct foreign investment and GDP

The findings reveal that

- Tangibility: The coefficient for tangibility is statistically significant, suggesting that it does have a negative significant impact on leverage (coefficient = -0.198, t-statistic = -10.53, p-value < .001).

- Size: The size variable shows a statistically significant positive relationship with leverage (coefficient = 0.032, t-statistic = 10.74, p-value < .001).

- Profitability Margin: The coefficient for profitability margin is statistically significant, indicating that it does have negative significantly influence leverage (coefficient = -0.004, t-statistic = -3.55, p-value < .001).

- Liquidity: The liquidity variable has a statistically significant negative relationship with leverage (coefficient = -0.016, t-statistic = -18.34, p-value < .001).

- Growth Opportunity: The growth opportunity variable is not statistically significant, suggesting that it does not have a significant impact on leverage (coefficient = 0.001, t-statistic = 0.48, p-value = 0.631**).**

Moderation Analysis results

GDP: GDP has a significant moderating effect on the relationship between liquidity, tangibility and size with leverage., however GDP does not significantly modify the relationships between profitability margin, and growth opportunity with leverage.

FDI: FDI has a significant moderating effect on the relationship between liquidity, Growth opportunity, profitability and size with leverage. However, GDP does not significantly modify the relationships between tangibility with leverage

Inflation Rate: Inflation rate has a significant moderating effect on the relationship between tangibility with Leverage. However, Inflation rate does not significantly modify the relationships between liquidity, Growth opportunity, profitability and size with leverage

Interest Rate: Interest rate has a significant moderating effect on the relationship between Profitability, Liquidity with Leverage. However, Interest rate does not significantly modify the relationships between size, tangibility and Growth opportunity with leverage

Brent Crude: Interest rate has a significant moderating effect on the relationship between Profitability, Liquidity and Growth Opportunity with Leverage. However, Interest rate does not significantly modify the relationships between size and tangibility with leverage Discussion

As per result Profitability and liquidity has a negative impact on leverage this give priority in Egypt to go more for picking order theory and companies prefer to use their money in capital structure finance also to avoid high interest rate especially in this period.

Size has positive effect on leverage support the easy way for big companies to get fund through the good relation and connections that make banking sector search for them to close their target of finance

For the tangibility with big amount reserved for depreciation may they can consider as liquidity so it will give us same when liquidity present will make the negative relation

Growth opportunity with no significant effect this consistent with Ariff, Chung, and Ghosh (2010) that the relationship is weaker in countries with

underdeveloped financial markets, where companies may face constraints in raising capital externally.

When GDP is high, suggests a strong economy with increased production and consumption. so, businesses may have higher sales and profits, which can improve their liquidity position. As a result, firms may find it easier to access additional funding or credit, On the other hand, during periods of low or negative GDP growth, businesses may face challenging economic conditions. A slowdown in economic activity can reduce sales and profits, impacting liquidity levels. So, the firms may find it more difficult to obtain financing or credit.

When also GDP is high it suggests good economic and give companies change for more profits but most of the time in Egypt companies moaned from the collection especially in big project which EGX 30 companies working mostly in this and according to Accrual principle in accounting there is profit but my no liquidity.

The link between tangibility and size with leverage is unaffected by GDP. In contrast to the relationship between tangibility and size with leverage, which focuses more precisely on the composition and nature of a firm's assets, GDP represents the general economic activity and growth in an economy.

The effect of FDI on leverage would depend on how the additional capital from FDI is utilized. If the FDI is primarily used to finance tangible assets, it may increase the level of leverage if debt is used to fund those investments. On the other hand, if the FDI is used to strengthen the equity base of the company or reduce existing debt, it could potentially lower leverage.

The effect of FDI on leverage would depend on how the additional capital from FDI is utilized. If the FDI is used to finance growth opportunities, invest in new projects, or enhance productivity, it may increase profitability. However, if the FDI is primarily used to fund debt servicing or interest payments, it could potentially increase leverage and impact profitability negatively.

the effect of FDI on leverage would depend on how the additional capital from FDI is utilized. If the FDI is primarily used to reduce existing debt or strengthen the equity base of the company, it could potentially lower leverage and have a positive impact on liquidity. However, if the FDI is used to finance growth opportunities or invest in assets, it may increase leverage and potentially impact liquidity negatively.

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