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Capital Structure on Firm Profitability: perspectives from non-financial listed Firms in Egypt

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Abstract

The primary goal of this study is to determine how capital structure (debt-equity) and profitability are related. The Financial information was gathered between 2003 and 2020.This research study investigates the intricate relationship between a firm's debt ratio and its profitability, aiming to shed light on the complex dynamics that exist within the financial structure of businesses. The debt ratio, often represented as the proportion of a company's debt to its total assets, is a crucial determinant of financial risk and leverage, and the variable of Profitability, on the other hand, is a fundamental measure of a firm's ability to generate earnings relative to its investments and operational costs as firm size The capital structure of a company is strongly influenced by its size, Larger companies have more access to different sources of money, whereas smaller companies may depend entirely on equity funding and other factor like industry type and other factors and Profitability variables serve as key performance indicators, reflecting the efficacy of a firm's operational and financial strategies. This section discusses return on equity (ROE) as popular metric for profitability. Through a comprehensive analysis, it underscores the importance of these variables in assessing financial health and driving value creation.

And The Achieving an optimal capital structure entails balancing risk and return considerations while aligning with organizational objectives. This section delineates the factors influencing capital structure decisions, ranging from market conditions and regulatory constraints to firm-specific characteristics. By exploring models and methodologies for optimization, it equips practitioners with tools for effective financial management and value creation.

Key Words: Capital Structure, Leverage , Profitability , Debit Ratio .

1.1 Overview

One of the main objectives of financial statement analysis is to determine firm value. Research suggests that a firm's value is a function of the expected future growth and profitability of the firm's capital structure, defined as the mix of debt and equity that the firm uses in its operations. A firm's judicious use of debt and equity is a key indicator of a strong balance sheet. A healthy capital structure that reflects a low level of debt and a high amount of equity is a positive sign of investment quality. The ability of firms to determine what they should concentrate on moving forward is mostly dependent on profitability analysis. Profitability can be examined in a variety of methods, from future prediction modelling to trend analyses that look backward in time. There are numerous theories about the best technique to analyze profitability. The idea behind profitability costing is to allocate all expenditures generated by a business to the numerous goods or relationships the organization maintains in an effort to identify which is the most profitable.

Many articles incorporate empirical studies and data analysis to examine the relationship between different measures of capital structure (such as debt-to-equity ratio, leverage ratio) and profitability metrics (such as return on assets, return on equity). By analyzing real-world data, researchers aim to uncover patterns, correlations, and causal relationships between capital structure decisions and firm profitability and Articles often focus on the impact of debt financing on firm profitability. They explore how the use of debt affects a company's risk profile, cost of capital, and overall financial health. Additionally, researchers investigate whether high levels of debt lead to financial distress or bankruptcy, and how this impacts profitability in the short and long term and Research often aims to identify the optimal capital structure that maximizes firm profitability. This involves balancing the benefits of debt financing (such as tax shields and leverage) with the costs (such as interest payments and financial risk). Articles discuss various methodologies for determining the

optimal capital structure and examine how deviations from this optimal level can affect profitability. Overall, the relationship between capital structure and profitability provides a comprehensive understanding of this complex and multifaceted topic, drawing on theoretical frameworks, empirical evidence, and practical implications for financial decision-making.

1.2 Importance of the Thesis

One of a company's and its manager's primary priorities is corporate profitability. A business simply has to maximize profits in order to survive over the long run; sustainability comes later. The cause of the shift in the business profitability pattern over time is one of the most significant issues that has been extensively researched in the literature. We also note how profitability is impacted by both internal and external factors. Analyzing its factors is not a unique research; in fact, a large number of studies have been conducted to determine how various firm- and industry-specific factors affect corporate profitability, So The current library of literature related to accounting and finance provides endogenous explanations for intra-industry variance in the profitability of companies such as Age, size, growth, leverage, capital intensity, and liquidity are some of these internal variables specific to the firm.

1.3 Objective of the Thesis

The objective of this research is to test factors that affect firm profitability, and to create an effective model, which when used by prospective companies in the market could help to increase and improve profitability.

1.4 Contribution of the Thesis

To the best of the researcher's knowledge, the following are the ways in which this thesis adds to the body of recent literature. The impact of capital structure on profitability, debt ratio and equity that leads to the firm's highest value.

Chapter Two

Relationship between debt ratio and profitability

2.1 Optimal Capital Structure

The capital structure of a corporation is a description of the financial proportions of the firm, that is, the ratio of long-term loan capital to own capital (equity). "Enterprises with high profitability levels have minimal debt, since companies with high profitability have plentiful internal funding resources," according to the Pecking Order Theory. There is no optimal capital structure in this pecking order theory (Myers, 1977), and the corporation has a hierarchy of preferences (hierarchy) in the usage of cash. According to Megginson et al. (2007)'s pecking order hypothesis, there is a hierarchy of possibilities in picking financing sources, with companies preferring internal funding above external investment. The pecking order hypothesis explains why enterprises with strong profit margins have low debt levels.

In another study, the cost of the capital structure must be decreased to the lowest level possible to optimize the firm's intrinsic worth. When you get to this point, you've found the best capital structure. Parmasivan & Subramanian (2009) define "optimal capital structure" as the capital structure or combination of debt and equity that leads to the firm's highest value. The optimal capital structure is one in which the Weighted Average Cost of Capital (WACC) is the lowest and the firm's value is the highest. The appropriate capital structure is a crucial choice for financial management since it is linked to the firm's worth. The capital structure of a corporation refers to the company's long-term debt and equity funding. According to Asaf (2004), "having the proper mix of debt and equity financing in the firm" is the "optimal capital structure." Most companies must weigh the number of tradeoffs when deciding on debt financing, including cost, liquidity, maturity, and the basis and frequency of interest rate resets.

2.2 Leverage and profitability

According to Ong (2011), a company's capital structure is crucial to how it finances its entire operations and expansion through various sources of funding. According to Khalid (2012), the source of money used by corporations to conduct their businesses is determined by events through various sources of funding. According to Khalid (2012), the source of money used by corporations to conduct their businesses is determined by events. Leverage, which is determined by the ratio of total liabilities to equity, refers to how much a business leverages its debt funding to boost profitability. Businesses that take out significant loans during a downturn in the economy are more likely to fail on their obligations when they mature, creating high leverage and an increased risk of bankruptcy. In contrast, the smaller the firm's borrowings, the lower its leverage and the risk of bankruptcy, implying that the company will continue to operate.

The link between leverage and profitability is explained in two distinct ways by the pecking order theory and the trade-off hypothesis. Leverage and profitability are negatively linked, according to the pecking order theory of capital structure (Myers and Majluf, 1984). Empirical evidence supported the existence of an inverse relationship between the leverage ratio and profitability in the books of Kester (1986), Titman and Wessels (1988), Rajan and Zingales (1995), Booth et al. (2001), and Khaled Al-Jafari and Samman (2015). According to Lalith (1999), there is a negative relationship between profitability and leverage, indicating that successful businesses use less of it. However, it is expected that there is a positive relationship between profitability and leverage based on the trade-off, signaling, and agency theories. According to the free cash flow theory (Jensen, 1986), debt reduces the agency cost of free cash flow and suggests that leverage and profitability are related positively, which is supported by a number of studies, including those by Frank and Goyal and Sangeetha and

Sivathaasan (2013). According to Nunes et al.'s (2009) analysis of profitability, Portuguese service firms are more successful when they maintain lower levels of debt and fixed assets. Burja (2011) and Mistry(2012) looked into how using debt affected profitability . Based on the above-mentioned literature, we examined the null hypothesis, which claims that there is a negative link between leverage and profitability in line with the pecking order theory. If this relationship were rejected, the trade-off theory would eventually win out.

2.3 Debt Financing

Debt capital in a company's capital structure refers to money that has been borrowed and put to use in the firm. According to Nawaz et al (2011), the safest form is long-term debt since the corporation has years, if not decades, to come up with the principal while simply paying interest in the interim. Debenture capital is a type of loaned capital that is held by the company's creditors, who are known as debenture holders. For the convenience of investors, many types of debentures are offered. Banks and financial institutions can also provide businesses with long- and medium-term loans. A public deposit is any money received as a deposit or loan from the general public, including workers, customers, and shareholders, other than in the form of shares or debentures, by a non-banking corporation. When a company decides to use debt financing to fund its operations, it takes on a financial risk and is classified as a leveraged company. According to Ehrhardt and Brigham (2011), financial risk is the additional risk imposed on common stockholders as a result of the decision to finance with debt. The likelihood that the firm's earnings will not be as expected due to the manner of financing is known as financial risk. Also, because debt carries a set financing requirement, generally in the form of interest, that must be satisfied when the obligation is due before the shareholders may partake in the retained earnings, there is a financial risk. Because various sectors and lines of business have distinct

operational characteristics, the degree of debt (financial leverage) that is acceptable in one industry or line of business might be extremely dangerous in another (Gitman & Zutter, 2012).

2.4 Firm Profitability

The main goal of every commercial firm is to make a profit (Nimalathasan, 2009). All business enterprises require significant financial investment to succeed. Profit is often a long-term goal that assesses not only the performance of the product and business but also the growth of the market for it. It is calculated by comparing revenues to related costs. Only expenses that directly contributed to the creation of the income are offset against it. A business has to make a profit to grow and expand over time.

The words "profit" and "profitability" are also used synonymously. There is, however, a distinction between the two in reality. Profit is an absolute term, whereas profitability is a relative concept. They do, however, play different functions in business and are tightly connected and dependent on one another. Profit refers to the total revenue generated by the business over a defined time period, whereas profitability relates to the business's operational effectiveness. It is the company's capacity to generate a profit from its sales as well as its capacity to obtain a satisfactory rate of return on the capital and labour put into the operation of the firm (Harward& Upton, 2007).

According to Almajali, Alamro, and Al-Soub (2012), there are several ways to measure financial performance. For example, return on sales tells how much a business makes in relation to sales , return on assets explains how well a business uses its assets, and return on equity exposes the profit investors expect to get from their investments and there are Three main dimensions can be used to evaluate a company's success. The first factor is the productivity of the business, or how effectively inputs are converted into outputs. The second factor is profitability, or the extent to

which a company's profits exceed its expenses. The market premium, often known as the point at which a company's market value exceeds its book value, is the third dimension. A company's owners and management, among others, are concerned about its financial stability. The owners put their cash into the company with the hope of getting a reasonable return, if not a big return. Similar to this, a company's management will naturally want to increase operational effectiveness. The profitability of the company ultimately determines how well it operates and what a suitable rate of return on the owner's cash should be. Therefore, it is necessary to overstate the critical importance of a company's earnings. Profits are required for a business to operate successfully and to protect itself from competitors. A company's or organization's ability to turn a profit will depend on the structural composition of its capital (Reddy,2012)

Profitability refers to a company's ability to make a profit and measures how efficiently a company uses its assets. According to Sucuahi & Cambarihan (2016), profitability is a term used for performance management in managing a firm. One of the factors that influence a company's value is its profitability. Because this ratio is clearly linked to the capital structure utilized by the firm, whether affected by the amount of long-term debt or own capital, the ratio of return on equity (ROE) was chosen as the measure of profitability in this study (Sucuahi & Cambarihan, 2016, Manoppo & Arie, 2016) .Profitability refers to a company's ability to make money and assess its own operational efficiency value and efficiency in using its own assets. Chen (2004) Profitability, according to Petronila and Mukhlasin (2003), is a picture of management's ability to run the business. Operational profit, net income, the amount of return on investment/assets, and the level of the capitalist's return on equity are all ways to measure profitability. According to Ang (1997), profitability and rentability ratios indicate a company's ability to generate profit. The ability of a company to profit from its operational activities is the primary focus of its

achievement measurement. Profit is an important factor in determining the firm's value, as well as an indicator of a company's capacity to meet its commitments to its shareholders. The effectiveness of a company is determined by comparing its net income to its assets in the form of a ratio, such as the profitability ratio. Profitability analysis focuses on a company's capacity to utilize its assets to generate profit over a set period of time, as evaluated by profitability ratios (Riyanto, 1999). Other proxies include Gross Profit Margin, Net Profit Margin, Return on Investment (ROI), Return on Equity, and Earning Power (Brigham and Houston, 2001).

According to Sarkar and Zapatero (2003), leverage and profitability have a positive relationship. Firms that are profitable and generate high earnings are expected to use less debt capital compared to firms that do not generate high earnings, according to Myers and Majluf (1984).

In 1958, Modigliani and Miller's research on the tension between capital structure and profitability was published. Several studies have concluded that profitability is favorably connected to capital structure, whereas others have discovered a strong negative association between profitability and capital structure. Because high-profit corporations are less likely to go bankrupt, it is assumed that they will have more leverage and debt.

The trade-off theory and the pecking order theory, two important capital structure theories, anticipate opposite directions of connection between leverage and profitability. Profitability should be positively connected to leverage, according to classical trade-off theory, because profitable businesses should borrow more to protect their revenue. Furthermore, debt is a control mechanism that prevents wasteful investment, according to Jensen (1986). In this aspect, the higher a company's profitability or free cash flow, the higher its leverage ratio should be. As a result, agency-based theories also relate profitability positively with the leverage. On the other hand, the Pecking-order theory predicts that corporations will first use internal funds, then debt,

and finally new equity when necessary, Therefore, pecking order theory suggests that there is a negative relationship between debt and profitability which is a source of internal funds.

As predicted by pecking order theory, most empirical studies find a negative relationship between profitability and leverage (Bauer, 2004; Booth et al., 2001; Chen, 2004; Friend & Lang, 1998; Huang & Song, 2006; Jong et al., 2008; Kester, 1986; Rajan & Zingales, 1995; Serrasqueiro & Rogao, 2009; Titman & Wessels, 1988; Tong & Green, 2005; Toy et al., 1974; Wald, 1999; Wiwattanakantang, 1999; Zou & Xiao, 2006). According to empirical research (Bayrakdaroglu et al., 2013; Durukan, 1997; Gonenc, 2003; Karadeniz et al., 2009; Saylgan et al., 2006), profitability and leverage have a negative relationship for Turkish companies. The proxies used for measuring profitability are generally EBIT scaled by ROE. Because of the tax shield in the theory, profits before taxes are most important when examining the Trade-off Theory. Since our study is primarily concerned with capital structures, determining profit should be independent of the firm's choice of financing strategy. Neither the cost of debt nor taxes are considered when using earnings before taxes and interest (EBIT or operational profit).

2.5 Relationship between Debt Ratio and Return on Equity.

According to Ong (2011), there is no connection between the debt equity ratio and return on assets. According to Ahmad (2012), only overall debt and short-term debt have a meaningful link ROE has a significant relationship with each level of debt. Additionally, Mohamad et al. (2012) observed that the debt-to-equity ratio had a weak negative correlation with return on equity (ROE). This suggests that any improvement in ROE. According to the regression analysis, ROE has have a negative correlation with the debt asset ratio. This suggests that changes in the debt level, whether positive or negative, will have a large impact on the firm's performance, therefore lowering the debt level will result in much higher ROE.

Ong (2011), however, discovered that there is no connection between the debt equity ratio and return on equity. This fact, which is corroborated by Shubita (2012), that the total debt has a strongly negative regression coefficient suggests that an increase in the debt position is related to a decline in profitability; hence, the greater the debt, the lower the profitability. The financial performance, growth, and size of the firms are all positively correlated with leverage, according to Javed and Akhtar's (2012) research.

2.6 Variables of Profitability

2.6.1 Firm Size

The capital structure of a company is strongly influenced by its size. Larger companies have more access to different sources of money, whereas smaller companies may depend entirely on equity funding. According to Titman and Wessels (1988), the debt-to-equity ratio should have a positive connection with company size since large companies tend to be well-diversified and have low earnings variation, allowing them to take on more debt. According to Marsh (1982), large firms, on the other hand, have more access to equity investment than small businesses do. Several studies have found that capital structure is positively related to firm size (Yu and Aquino, 2009; Du and Dai, 2005; Huang and Song, 2006; Ezeoha, 2011; Hovakimian et al., 2004; Agrawal and Nagarajan, 1990).

According to the trade-off theory, larger organizations leverage more since there is a negative relation between size and bankruptcy costs or a decreased risk of financial difficulty. Size is used as a measure of information asymmetry between the company and the capital markets in the pecking order theory (Frank and Goyal, 2009). As a result, the larger the organization, the more information is shared with employees outside the company. The natural log of total assets is used to determine the company's size. The majority of studies have found a positive relationship

between a corporation's size and debt raising, which is consistent with the tradeoff theory (Bauer, 2004; Deesomsak et al., 2004; Kayo, E. and Kimura, H. 2011; Al-Najjar and Hussainey, 2011; Ogbulu and Emeni, 2012; Forte et al., 2013; Chen et al., 2014; Handoo and Sharma, 2014; Serghiescu and Vaidean, 2014; Köksal and Orman, 2014; Chang et al., 2014; Oino and Ukaegbu, 2015; Müller, 2015; M'ng et al., 2017; and Moradi and Paulet, 2019).

Firm bankruptcy costs are inversely related to their size, with larger firms having lower bankruptcy costs than smaller ones and vice versa. To elaborate, the cost of bankruptcy may be incurred in both a direct and indirect way. A direct bankruptcy cost might be the liquidation return, while an indirect cost could be the stakeholders' loss of trust in the company's long-term viability. On the other hand, Deloof and Overfelt (2008); Rajagopal (2011) discovered a negative relationship between capital structure and firm size. This could be due to the fact that a larger company can get financed through the issuance of stocks instead of debt, so a large-sized firm uses the minimum amount of debt in its capital.

Other research has found that size does not always determine capital structure decisions (Kamierska-Jówiak et al., 2015), and that there is no impact or a negligible connection between size and debt (Salameh et al., 2012; Malini et al., 2013; and Chipeta and Deressa, 2016). As a result, we predict a positive relationship between size and capital structure.

Different conclusions have been drawn from empirical evidence about the connection between firm size and profitability. Demsetz provided an alternate explanation for the relationship between firm size and profitability by suggesting that large companies generate huge profits with little to no reliance on conventional scale efficiencies. This study also shows that in highly concentrated markets, large firms produce larger profits, whereas small firms only generate average returns. According to research by Fukao (2006), Nunes et al. (2009), Asimakopoulos et

al. (2009), Stierwald (2010), Yazdanfar (2013), Pratheepan (2014), and Zaid et al.(2014), the size of the company has a positive effect on profitability . The relationship between business size and profitability was determined to be negative by Goddard et al. in (2005). However, in our analysis, we used neoclassical viewpoints, which explain the link through economies of scale. Empirical literature has demonstrated that there is both a negative and a positive association between business size and profitability. The benefit of economies of scale may be found in several situations. First, economies of scale may exist in several financial areas, allowing large businesses to benefit from lower interest rates and better discount rates because of their large quantity. Second, organizational structure may allow for economies of scale, allowing businesses to benefit from significant specialization and labor division. Third, economies of scale may be affected by technological factors, such as the ease with which a large number of units may be divided into small ones with high fixed costs.

2.6.2 (TIER)Time Interest Earned Ratio

The Time Interest Earned Ratio (TIER), also known as the coverage ratio, gauges how much income may drop off without compromising the business' ability to pay interest expenses. The greater the company's debt, the greater the interest on its debt, which reduces its profitability. The value of the company will be affected by declining profitability. On the other hand, if the cost of interest on the loan is not significant, the business can afford it.

This shows the demonstrates how the profitability and value of the company are impacted by the Time Interest Earned Ratio. Results from Agum Sulistio and Muhammad Saifi (2017), Suandini and Suzan (2015), and others showed the impact of TIER on corporate profitability .

The resultant interest rate ratio, known as the Time Interest Earned Ratio (TIER), shows how much or how many times the corporation can afford to pay interest. The quantity of earnings

before interest and tax serves as a measure for the company's capacity in this situation (Hery, 2016). The formula below can be used to compute the time interest income ratio (TIER).

TIER= Earnings before interest tax / interest expenses

This ratio calculates the amount of guaranteed earnings required to pay the interest on long-term debt. The ratio determines how much profit is left over after taxes, interest, and other expenses. As there are more resources available to cover interest payments, a high percentage indicates a secure condition.

Return on Equity (ROE)

A firm's net income is divided by its equity. It shows the ability of the firm's equity to generate profits. The ROE ratio is another metric that shows the overall financial health of a company. It is a ratio that analysts use to evaluate a company's performance. The return on equity (ROE), which represents the finance given by the shareholders, shows the revenue produced for the shareholders. The ROE measures the return earned on the stockholders' investment in the firm.

According to Gitman and Zutter (2012), Ehrhardt & Brigham (2011), and Ross et al. (2011), the simplest way to determine ROE is to take net income that has been recorded for a period and divide it by shareholders equity . On the other hand, other experts, like Lindow(2013), divide EBIT over shareholders' equity . This is a purely objective measurement of a company's ability to generate returns on equity, unaffected by management financing choices. According to Malm & Roslund (2013), the ROE might indicate if a company is able to locate profitable investment possibilities, which is important for companies that wish to remain competitive. Return on equity (ROE) is a factor that can impact on a company's value. The ability of a corporation to make a profit after taxes through the use of its capital is measured by its return on equity (ROE) (Sudana, 2015). The share price of the firm will rise in parallel with an increase in ROE. The profitability

enjoyed by shareholders will rise as a result. ROE factors' effects on their value are partially significant, according to research by Cahyanto et al. (2014). Agustiani (2016) and Rosikah et al. (2018) came to the opposite conclusion, claiming that return on equity (ROE) had no effect on the company's value.

The Return on Equity ratio may be used by shareholders to calculate the returns on each investment. According to Kasmir (2016), ROE is a ratio that compares net profit after tax to capital. Growth in ROE indicates that the company's prospects are improving as a result of its ability to increase profits. ROE illustrates how well one's own money is used. Net ratio and own capital are compared using return on equity (ROE). This ratio represents the share of profit derived from (or being the right) of the capital itself and is often used by investors to purchase shares of a company. The Return on Equity (ROE) calculation formula is as follows:

$$ROE = (\text{Net Profit after Tax} / \text{Total Equity}) \times 100$$

Industry Type

A firm's debt ratio is reported to be strongly correlated with the industry to which it belongs. Drugs, instruments, electronics, and the food business are said to have low leverage, but the paper, textile mill, products, steel, airline, and cement industries are said to have high leverage (Harris et al., 1991). Significant attention has been given to the relationship between capital structure and membership in industrial firms. As a result, it is generally accepted that companies within a particular industry have similar leverage ratios and that these ratios differ throughout industries. On Bowen, Daly, and Huber (1982), Bradley, Jarrell, and Kim (1984), Long and Malitz (1985), and Kester (1986), Hatfield et al. (1994), Schwartz and Aronson (1967), Harris and Raviv (1991), all discovered that certain industries have a typical leverage ratio that is stable over time.

Data and Variables

The data are obtained from Egypt for Information Dissemination (EGID) including the non-financial firm that are listed in Egypt Stock Exchange. The data covers 24 non-financial firms listed in EGX30 using annual data for 10 years 2013 – 2022.

Variables

The influence of capital structure on corporate profitability is the topic of this study. The dependent variable is the ROE. They relate to how much profit a company makes from its asset investments and how well managers handle investors' money. The independent variables are the ratios of total liabilities to total assets (TLTA) and total equity to total assets (TETA).

More capital structure determinants are employed as performance indicators as control variables. It includes asset tangibility (TANG), which is defined as the ratio of fixed assets to total assets; tax (TAX), which is defined as the ratio of tax to earnings before interest and tax; business risk (BR), which is defined as the ratio of percentage change in EBIT to percentage change in net sales; **ROE** Return on equity is the measure of the amount of net income returned as a percentage of shareholders' equity. It measures a firm's profitability by revealing how much profit a company generates with the money that shareholders have invested.

TANG: Asset tangibility is defined as the ratio of fixed assets to total assets:

TANG=Fixed assets/Total assets

TAX: Tax is described by the ratio of tax to earnings before interest and tax:

TAX=Tax/EBIT

LIQ: Liquidity is the ratio of current assets to current liabilities:

LIQ=Current assets/Current Liabilities

BR: Business risk is measured with the help of degree of operating leverage, which is calculated by the ratio of percentage change in EBIT and percentage change in net sales:

BR=%change in EBIT%/change in net sales

TLTA: It is defined as the ratio of total liabilities to total assets:

TLTA=Total liabilities/Total assets

TETA: It is defined as the ratio of total equity to total assets:

TETA=Total equity/Total assets

IR: Consumer Price Index (CPI) is used as the inflation rate.

Descriptive Statistics.

In this subsection, descriptive statistics such as mean, standard deviation, minimum, and maximum are presented for all the variables of the study.

Table

Variables	Min	Max	Mean	Standard Deviation
Debt/Equity Ratio	0.782	13.44	8.19	5.1971
Net Profit Margin	-0.05410	0.73200	0.01560	0.03810
Times Interest Earned	0.91200	2.71200	1.72400	22.91000
Gross Profits/Total Assets	-0.71900	0.62400	0.05100	0.03810
Net Operating Profits/Total Assets	-0.06720	0.71890	0.00250	0.02500
Net Income/Earnings Before Taxes	-0.70340	0.63960	0.06660	0.05370
EBIT Per Share	4.01000	7.11000	0.89100	0.62900
Growth Of EBIT Per Share	0.03460	4.32000	1.39000	1.06200
Net Income Percentage Change	0.57482	0.91274	0.71481	0.43578
Dividend Yield	0.03532	0.43125	0.16307	0.14087
Basic Resources	0	1	0.2300	0.3162
Health Care & Pharmaceuticals	0	1	0.1588	0.5395
Industrial Goods , Services and Automobiles	0	1	0.5479	0.8266
Real Estate	0	1	0.0996	0.6365
Travel & Leisure	0	1	0.6487	0.7512

Utilities	0	1	0.1945	0.4920
IT , Media & Communication Services	0	1	0.1340	0.6890
Food, Beverages and Tobacco	0	1	0.7871	0.6553
Energy & Support Services	0	1	0.8045	0.0871
Trade & Distributors	0	1	0.3376	0.9810
Shipping & Transportation Services	0	1	0.9463	0.0960
Education Services	0	1	0.1422	0.3388
Contracting & Construction Engineering	0	1	0.7939	0.5505
Textile & Durables	0	1	0.4063	0.8664
Building Materials	0	1	0.9351	0.8310
Paper & Packaging	0	1	0.2173	0.6581

Variance Inflation Factor (VIF)

Mixed effect model is used to assess the independent variables against the dependent variable.

Table

Variables	VIF	1 / VIF
Debt/Equity Ratio	1.740252	0.57463
Net Profit Margin	2.415447	0.414002
Times Interest Earned	3.180562	0.31441
Gross Profits/Total Assets	0.29569	3.381917
Net Operating Profits/Total Assets	2.731716	0.36607
Net Income/Earnings Before Taxes	3.917485	0.255266
EBIT Per Share	3.844635	0.260103
Growth Of EBIT Per Share	1.887042	0.52993
Net Income Percentage Change	0.145595	6.86835
Dividend Yield	1.596279	0.626457

Hausman test

Table

Test:	Ho: difference in coefficients not systematic
	chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
	= 3.51

	Prob>chi2 = 0.189

From the above table, we can conclude that the best model for fitting the first model is random effect model as the p-value associated with the test is larger than 5%.

RESET test

Ramsey RESET test using powers of the fitted values of ROE.

Ho: model has no omitted variables

F(3, 240) = 0.771

Prob > F = 0.511

From the above we can conclude that at 95% confident we fail to reject the null hypothesis of the Reset test which means that the linear model is appropriate.

Heteroskedasticity test.

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of ROE

chi2(1) = 63.21

Prob > chi2 = 0.0000

From the above table we can conclude that the null-hypothesis of the Breusch-Pagan / Cook-Weisberg test for heteroskedasticity is rejected and this with confident 95%, this mean that variances of residuals are not constant, this means that we will use the robust estimation in order to estimate the parameters of the model.

Summary of the model.

In the following table the results are summarized in the following table According to the listed results, The p-value equals 0.000 which is significant (less than 0.05). This means that there is at least 1 variable of the independent variables that has significant effect on ROE. Also, from the value of overall R^2 value of 0.533 indicates the fit of the model. The proposed model could infer 53.3% of the total variance in the ROE.

Table: Summary of the model

Random-effects GLS regression	Number of observations	=	240
Group variable: ID	Number of groups	=	24
R-sq:	Observations per group:		
within = 0.105	Min	=	1
between = 0.514	Avg	=	5.5
overall = 0.335	Max	=	10

Mixed effect regression model.

The mixed effects model can be defined as:

$$Y_i = X_i\beta + Z_i b_i + \varepsilon_i,$$

where Y_i is an $t_i \times 1$ vector of observations for ith market takes the form $[y_{i1}, \quad y_{i2}, \ldots\ldots \quad y_{it}]^T$, X is an $t_i \times p$ matrix of covariates, and β is vector of covariates, and $Z_i, a\ t_i \times q$ (number of unknown variables) is a subset of X_i, modeling how the response evolves over time for the i^{th} Market. Furthermore $b_i = [b_{io}, b_{i1}, \ldots\ldots\ldots\ldots, b_{i(q-1)}]^T$ is a $q \times 1$ vector of random effects for the i^{th} Market describing unknown market characteristics. ε_i is a vector of residual components, it is usually assumed that the errors $\varepsilon_i's$ are independent and normally distributed with mean vector 0 and covariance matrix $\sigma_\varepsilon^2\ I_{m_i}$, and the random effects $b_i's$ are independent of $\varepsilon_i's$, and normally distributed with mean vector 0 and covariance matrix V_b. any model, regression model has assumption, which are:

a- No Multicollinearity: Multicollinearity is defined as a linear relation between explanatory variables and can be checked through Variance Inflation Factor (VIF). Multicollinearity is suspected if the VIF value is greater than 10.

b- Linearity is also one of the assumptions of regression model. The linearity can be checked using RESET test.

c- The homogeneity of the residuals will be also checked and if the residuals is not homogeneous then, robust estimation will be used.

Choosing between fixed effect and random effect model is done according to the results of Hausman test. Five models will be estimated using the general structure that follows.

$$y = b_o + \sum_i b_i * X_i + \varepsilon$$

Where: β_0 : is the constant term; β_i : is the regression coefficient for independent variable I

ε: is the regression residual term; For each model we will first present the Hausman to test to choose between fixed and random model , and the reset test to check if the linear forum is appropriate for estimating the model or not, and heteroscedasticity test to show if residuals is homogenous or not, and if we find that residuals is not homogeneous then a robust estimation is used.

Discussion of the Results

Table Dependent Variable: Debt/Equity Ratio

Independent Variables	Model 1	Model 2	Model 3
Net Profit Margin	0.134*** (5.62)	4.13E-19 (0.543)	1.79E-19 (1.04)
Times Interest Earned	-0.0215*** (-4.91)	0.951*** (6.99)	0.825*** (6.35)
Gross Profits/Total Assets	-11.39*** (-6.93)		
Net Operating Profits/Total Assets	-2.458*** (-3.11)		

Net Income/Earnings Before Taxes		0.961*** (7.91)	0.356*** (5.53)
EBIT Per Share	-7.51E-06 (1.21)		
Growth Of Ebit Per Share	0.000123*** (4.33)	-0.361*** (-3.01)	-0.176*** (-2.89)
Net Income Percentage Change		-0.0105*** (-2.99)	-0.0369*** (-3.74)
Dividend Yield	-4.36e-05** (-1.87)	-1.08E-05 (-0.032)	2.38E-07 (0.044)
Industry Type		Yes	
Size Effect			yes
Constant	3.243*** (2.88)	2.100*** (3.52)	0.398 (0.992)
Adjusted R Square	0.113	0.127	0.134
F stat	34.75***	78.45***	893.99***
Observations	240	240	240
Number of ID	24	24	24
T stat in parentheses; *** p<0.01, ** p<0.05, * p<0.1			

Discussion of the Results

Firm Size , Capital structure, which is shown in the company's financial accounts at the end of the year, is the ratio of a company's debt to its own capital. Debt to Equity Ratio (DER) is a tool that may be used to evaluate capital structure . If the DER rises, the firm's value will rise so long as has not reached its optimum point in accordance with the trade-off theory. According to the trade-off hypothesis, one may increase profitability by raising DER value (the amount of debt), but only if the debt is raised and used correctly. Rahman (2014) performed research on this topic and came to the conclusion that profitability can mediate the effect of capital structure on firm value. The size significant effect and same results in aspen reported in Ullah (2012), Shamshur (2010) and Cuong (2012) ,Javed & Akhtar (2012).

Times interest earned , more company's borrows money higher amount of interest so the smaller number of times , when debt/equity ratio increase the interest increase so the time decrease so the negative relationship between time interest earned and interest expenses in observed profitability indicators (Kraus & Litzenberg 1973, Brealey *et al.* 2008, Ross *et al.* 2008, Ross *et al.* 2013).

Growth of EBIT per share , the higher of debt equity ratio therefore the higher of growth rate the company's is using the debt financing very efficiency Javed & Akhtar (2012) , Ebadi (2011) but the growth rate of EBIT decreasing because the increasing not the same for debt equity ratio, Shah (2007).

profit margin , in some results the debt equity is significant negatively with profit margin Eriotis, N. P., Frangouli, Z., & Ventoura-Neokosmides, Z. (2002) , Abdul (2012) but in optimal profitability indicators is positive relationship when debt equity ratio increases the profit margin increase when the company using the loan very efficient .

According to Abor (2005) when the global economic downturn leading to the negative connection between profitability and total debt, the high cost of debt, which is mostly due to the usage of long term in particular, has resulted in significant decreases in profit margins , significant positive relationship between profitability and short-term debt for the banking & finance, distribution like in optimal profitability indicators.

ROE

According to Abor (2005) ,the negative relationship between long-term debt and ROE, total assets and profitability in the manufacturing industry because long-term debt is relatively expensive because the use of it is associated with falling profits , and like the optimal profitability indicators significantly positive relation between the ratio of short-term debt to total

assets and ROE. In Ching et al (2011) research, it was found that the debt asset ratio had an impact on the return on assets. Additionally, Mohamad et al. (2012) found that the debt equity ratio had a negative correlation with return on equity (ROE). The debt asset ratio was associated negatively with ROE according to the regression results. As a result, lowering the debt level will significantly increase ROE since it is indicated that changes in the debt level, whether positive or negative, will have a considerable impact on the firm's performance, like observed profitability indicator has negative relationship with debt ratio.

Conclusion

It appears difficult to reach agreement on the appropriate, or optimum, level of debt to use in order to maximize value for firm owners. This is because capital structure policy plays a significant role in determining a firm's competitiveness and ability to continue as a going concern, as our study demonstrates the understanding how capital structure decisions affect profitability is essential for firms seeking sustainable growth and long-term success. A well-structured capital mix can optimize the cost of capital, leading to improved profitability through efficient allocation of resources and reduced financial risk , and analyzing the relationship between capital structure and debt ratio is vital for managing financial risk and ensuring liquidity. Excessive debt levels can increase the firm's vulnerability to economic downturns and limit its ability to invest in profitable opportunities. By examining the optimal debt-to-equity ratio, firms can strike a balance between leveraging financial leverage for growth and maintaining financial flexibility to withstand adverse market conditions ,and investigating the impact of capital structure on equity and its role in maximizing firm value is crucial for shareholders and investors. Equity represents ownership in the firm and is a key determinant of shareholder wealth. Understanding how capital structure decisions influence equity value can help investors assess the firm's risk-return profile and make

informed investment decisions. Overall, studying the effect of capital structure on profitability, debt ratio, and equity, and its implications for firm value, provides valuable insights for managers, investors, and policymakers. By optimizing capital structure decisions, firms can enhance their competitiveness, improve financial performance, and create sustainable value for stakeholders in the long run.

References

Abor, J., (2005). "The effect of capital structure on profitability: empirical analysis of listed firms in Ghana". Journal of Risk Finance, 6(5), pp. 438-45.

Alkhatib, Khalid. (2012). The Determinants of Leverage of Listed Companies. International Journal of Business and Social Science Vol. 3 No. 24, Special Issue – December 2012.

Ahmad, Zuraidah, Abdullah, Norhasniza Mohd Hasan & Roslan, Shashazrina. (2012). Capital Structure Effect on Firms Performance: Focusing on Consumers and Industrials Sectors on Malaysian Firms. International Review of Business Research Papers Vol. 8. No.5. July 2012. Pp. 137 – 155.

Agustiani, R. (2016). Pengaruh Good Corporate Governance, Return on Asset, Return on Equity, Bopo, Dan Capital Adequacy Ratio Terhadap Nilai Perusahaan Go Public Di Bursa Efek Indonesia. Jurnal Ilmiah Ekonomi Bisnis, 21(2), 178520.

Brigham, E.F. and Ehrhardt, M.C. (2011), Financial Management: Theory and Practice, (13thed). Mason: South-Western Cengage Learning.

Ching, Hong Yuh, Novazzi, Ayrton & Gerab, Fábio. (2011). Relationship between Working Capital Management and Profitability in Brazilian Listed Companies. Journal Of Global Business and Economics July 2011. Volume 3. Number 1.

Cahyanto, S. A., Darminto, & Topowijono. (2014). Pengaruh Struktur Modal Dan Profitabilitas Terhadap Nilai Perusahaan (Studi pada Perusahaan Otomotif dan Komponennya yang Terdaftar di Bursa Efek Indonesia Periode Tahun 2010-2013). Jurnal Administrasi Bisnis (JAB), 11(1).

Gitman, L.J. and Zutter, C.J. (2012), Principles of Managerial Finance, (13thed). Boston: Prentice Hall.

Hery. (2015). Analisis Laporan Keuangan (1st ed.). Center For. Academic Publishing Services.

Janice, J., & Toni, N. (2020). The Effect of Net Profit Margin, Debt to Equity Ratio, and Return on Equity against Company Value in Food and Beverage Manufacturing Sub-Sector Companies listed on the Indonesia Stock Exchange. Budapest International Research and Critics Institute (BIRCI-Journal) : Humanities and Social Sciences, 3(1), 494–510. https://doi.org/10.33258/birci.v3i1.799

Hanafi, M. M. (2010). Manajemen Keuangan (Pertama). BPFE.

Hery. (2016). Analisis Laporan Keuangan (Integrated and Comprehensive Edition). Jakarta: PT. Grasindo.

Javed, Benish & Akhtar, Shehla. (2012). Interrelationships between capital structure and financial performance, firm size, and growth: comparison of industrial sector in KSE. European Journal of Business and Management www.iiste.org ISSN 2222-1905 (Paper) ISSN 2222-2839 (Online) Vol 4, No.15.

Kasmir. (2016). Analisis Laporan Keuangan. Raja Grafindo. Maduretno Widowati, P. W. (2016). Analisis Roa Dan Roe Terhadap Nilai Perusahaan Dengan Corporate Social Responsibility Sebagai Variabel Moderating. Jurnal STIE Semarang, 8(3).

Lindow, C. M. (2013), A Strategic Fit Perspective on Family Firm Performance, Germany: Springer Fachmedien Wiesbaden

Malm, S. & Roslund, E. (2013), the Bond-to-Total Debt Ratio and its Impact on Firms' Performance. Master Thesis, Umea University, Sweden.

Mohamad, Nor Edi Azhar Bte, & Abdullah, Fatihah Norazami Bt. (2012). Reviewing Relationship between Capital Structure and Firm's Performance in Malaysia. International Journal of Advances in Management and Economics. ISSN: 2278-3369, July-Aug, Vol.1, Issue 4, 151- 156.

Rahman, S. 2014. The role of intellectual capital in determining differences between stock market and financial performance. International Research Journal of Finance and Economics, Vol. 89, 46-77

San, Ong Tze, Teh Boon Heng. (2011). Capital Structure and Corporate Performance of Malaysian Construction Sector. International Journal of Humanities and Social Science Vol. 1 No. 2; February.

Sudana, I. M. (2015). Manajemen Keuangan Perusahaan (Kedua). Erlangga.

Shubita, Mohammad Fawzi & Alsawalhah, Jaafer Maroof. (2012). The Relationship between Capital Structure and Profitability. International Journal of Business and Social Science Vol. 3 No. 16.

Rosikah et al. (2018). Effects of Return on Asset , Return On Equity , Earning Per Share on Corporate Value. The International Journal of Engineering and Science (IJES, 7(3), 6–14. https://doi.org/10.9790/1813-0703010614

Ross et al. (2003), Corporate Finance: Volume 1, (3 thed). United States of America: McGraw-Hill/Irwin.

San, Ong Tze, Teh Boon Heng. (2011). Capital Structure and Corporate Performance of Malaysian Construction Sector. International Journal of Humanities and Social Science Vol. 1 No. 2; February.