

# EVALUATE THE IMPACT OF CAPITAL STRUCTURE MODELING ON THE PERFORMANCE OF PRODUCTION PROCESSES

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## ABSTRACT

The research aims to explore the impact of capital structure modeling on production business performance in order to arrive at a conclusion. Data were collected based on input from six Turkish cement producing companies. Analysis of the collected data was then used to achieve the goal. In the first part of the study, the concept of capital structure was explained, and the theories, namely the irrelevance theory, the trade-off theory (TOT), and their types, were discussed. The determinants of all capital structures and company-specific and capital structure models were also identified. The second part of the study was the practical part, where data on Turkish companies was used to achieve the goal. An input analysis of the capital structure of the selected sector was performed in order to generalize and clarify the conclusions regarding the capital structure of the analyzed companies. Where the main problem lies in determining the indicators of the capital structure that affect the performance of productive businesses. Performance was evaluated using economic value added (EVA) scale, correlation matrix, Cohen's scale, and SPSS.

We have developed some capital structure measures to investigate the links between these indicators and the overall performance of the organization. Correlation research results have shown significant improvements using regression analysis and principal components analysis to study the impact of certain unrelated elements on the overall success of the company. As a result, we recommend developing a new option that is willing to bear the risks associated with both options. The results of this study will serve as the basis for further research, including the collection of more relevant data and a further set of analyses.

**Keywords :** Capital Structure, Business Performance, Capital Modeling, State of Turkey.



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\* بحث مستل من رسالة ماجستير .

## **INTRODUCTION**

The measuring of business success is indeed a relevant research area in the the present everchanging global markets. Different metrics are used to assess performance . In this study , we examine how capital structure modeling affects business performance , which allows people to differentiate themselves depending on the part of a company's financial health that they find most appealing .

In European Foundation for Quality Management should define performance (Gabriela-Livia, 2021) . People , organizations , groups , and processes' performance is described as "the degree of results attained by groups , people , institutions and procedures According to some authors , performance is tied to a company's success and survival through defining the fundamentals of its existence in the market environment . Performance is determined by the level of profit if we start with the ability of the business to recognize present resources . (Tedla, 2016).

Capital Structure Modelling is a technique used in investment banking to forecast the projected future financial performance of a company . This is done by making critical assumptions about how a company or a particular project will perform in the coming years , such as how much cash flow the project is anticipated to generate within five years of starting . It is possible to perform operations on various model regions without affecting the structure , making it feasible to prevent significant mistakes . When the input is unpredictable and liable to change as new information becomes available , it is helpful to adopt this method . Consequently , there is some leeway with the structure of the model when it comes to working on financial modelling so long as the system is plausible (Graham, 2022) .

## **1. CONCEPTUAL FRAMEWORK**

### **2.1 Capital Structure**

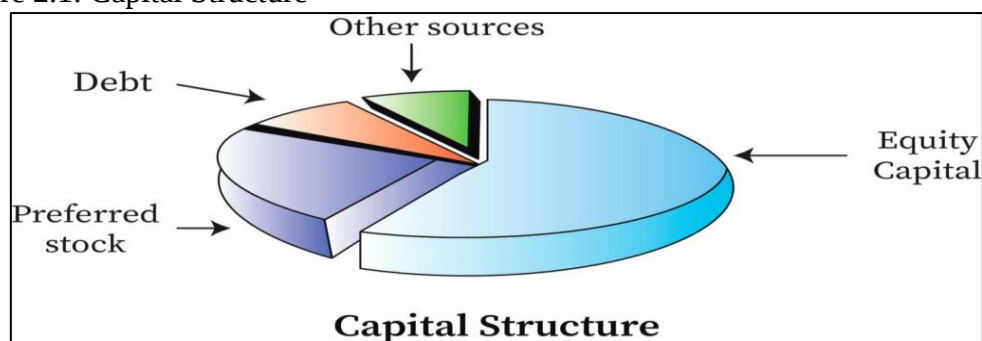
This chapter presents main concetps in organizational capital structure . The research that is presently accessible will be utilized to identify the factors of capital structure and their expected effects on capital structure . This will be done using the analysis that is already available . The use of the study that is now available to us will allow us to achieve this goal . The conclusions drawn from the outcomes of earlier studies served as the foundation for the hypotheses investigated in this study ( Lindkvist , 2020 )

The cash flow generated by a business's assets is often regarded as the principal source of revenue generated by the firm. When capital is contributed in shares , the recipients of subsequent cash flows are the investors . When an investment is undertaken with the help of debt , the people who hold the loan are entitled to a portion of the cash flows generated by the asset . According to research conducted by Brealey and colleagues in 2017 , the term "capital structure" refers to the combination of debt and equity financing used in a business's daily operations. There are many other definitions of capital structure, some of which include the following: funding the company through a variety of sources such as stock and debt; selecting various options to create money to support the organization's operating operations (Mujahid and Akhtar, 2014). The concept of capital structure incorporates both of these instances within its discussion (Lim, 2012). Every definition begins with the same base, which is the total amount of a company's debt and equity, the balance of each, and the proportional share that each contributes to the total. Finding the correct balance between a business's debt and the sources of cash it has available may be difficult when there are so many various ways in which a firm can mix the two.

On the other hand, the capital structure theory was formulated for the first time more than sixty years ago. It is generally agreed that Modigliani and Miller were the ones who came up with the concept of the original capital structure theory. This concept was the starting point for not just an ongoing conversation but also further research that tested and built upon the original notion. The premise of Modigliani and Miller's theory served as the foundation for the creation of other theories, including the pecking order theory, the trade-off theory, and the agency costs theory, all of which are covered in the following sentences. (Cerkovskis, 2022).

Figure 2.1 shows the components of capital structure. The pecking order theory is another theory that will be addressed in the following sections.

Figure 2.1: Capital Structure



Source: Dhoot (2021)

## 2.2 Capital Structure Theories

### 2.2.1 Irrelevance Theory

This concept, presented by Modigliani and Miller (1958) and is also known as the “capital structure irrelevance hypothesis,” is regarded as the cornerstone theory. It was named after the two economists who first developed it. If one accepts the assumption as accurate, then the decision of whether to raise capital via debt or equity seems to have no impact on the company’s value. It was established on very narrow presumptions that have zero relevance to the real world in any way, shape, or form. The notion is that financial markets are flawless because all information is readily available, there are no taxes, and there are no transaction costs. On the other hand, Modigliani and Miller modified their earlier assumptions in 1963 by considering the part that tax advantages play in shaping the capital structure of a firm. This was done to account for the function that tax benefits play in the process. As a direct result, various theories, such as the trade-off theory, the pecking order theory, the agency theory, and the market timing theory, have been proposed as alternatives to the (M and M) theory to account for an imperfect market. These ideas include:

M and M indicates that the value of a company is not impacted by the method in which the firm is funded, provided that certain assumptions are satisfied. This leads one to believe that the firm’s debt-to-equity ratio and the company’s capital structure do not affect the company’s value. This concept is known by a few different names, such as the Modigliani and Miller hypothesis and irrelevance theory. The results that Brealey et al. Obtained in 2017 are consistent with M and the findings of M and M. They argue that the total cost of capital will be the same as the cost of equity when complete equity financing is achieved if the firm funds itself a mix of debt and equity. This means that the overall cost of capital will be the same. The idea that Modigliani and Miller put out is the basis for all of the various capital-structure theories that have been proposed. Since they first offered this idea, a significant amount of study has

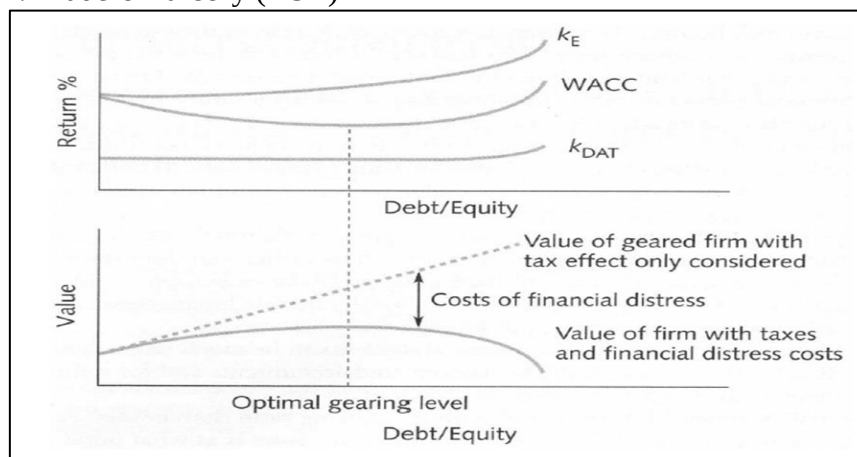
been carried out to discover whether or whether an organization's funding influences the worth of that organization, as M and M mathematically stated.

### 2.2.2 Trade-Off Theory (TOT)

One of the essential concepts that have survived the time test is the capital structure hypothesis. According to this interpretation of the theory, the optimum level of debt is reached at the point when the marginal advantage of debt financing is equivalent to the marginal cost of using it. Adjusting the proportions of debt and equity, finding a balance between the cost of the tax shield and the cost of a financial crisis, and making adjustments to the tax shield are how a firm might attain the best capital structure for itself. The academic community does not easily understand the meanings of the phrases "benefit" and "cost". Hence they cannot be agreed upon. To answer the "Capital Structure Puzzle," the "Trade of Theory" is employed as a theoretical framework. This helps reduce some of the constraints of MM Myers (1984) thesis, which said that the capital structure does not matter. The use of debt up to a particular amount, as stated by Myers (1984) covers the expense of financial hardship and interest tax protection. According to Zeitun (2002) the most effective method for determining the best capital structure is to consider the tax-deductibility of interest on debt, the cost of bankruptcy, and the cost of an agency. It is believed that this is the most effective method for determining the appropriate capital structure.

In Figure 2.2, Arnold (2008) explains how the value of a company is impacted when there is an increase in the proportion of loan capital to equity capital in the company's capital structure. An increase in the proportion of loan capital to equity capital results in a more leveraged capital structure.

Figure 2.2: Trade-off theory (TOT)



Source: Ghazouani (2013)

## 2.3 Determinants of Capital Structure

Each of the several theories explains the capital structure of a company and the procedure that was followed to construct it . Utilizing the so - called determinants, which have been used relatively often in previously written work , it is feasible to put these ideas to the test and see how well they hold up . Each of these characteristics influences the capitalization structure in a manner exclusive to itself in its way . Throughout this inquiry , we will use three different types of factors : those that are special to the company , those specific to the industry , and those particular to the nation .

## 2.4 Firm-Specific Capital Structure Determinants

According to Psillaki (2009), variations in a company's capital structure can be explained by characteristics that are exclusive to that company. . The most important aspects will be examined by placing them within three different theories: Theories of agency costs, pecking orders, and trade-offs are referred to in this phrase. the level of a company's profitability is also often referred to as the business's performance, is the aspect that must get the most attention. Because this research emphasizes how the makeup of a company's capital may influence its overall performance, profitability, which is a measure of how well a business is performing financially, is one of the essential aspects to consider in this investigation.

The many criteria for profitability will be dissected in great detail in the chapter dedicated to research methods, particularly in the lines that examine the ways that have been utilized in the past and continuing studies. A corporation's use of leverage ought to have a beneficial influence on that corporation's profitability by the idea of trade-offs, which states that trade-offs might be positive or negative. Higher levels of leverage may be justified by the agency's expenditures, the expenses of the bankruptcy, and the taxes, as stated by Fama and French (2002). Profitable businesses get a more significant advantage from tax cuts than those that are not because they have a more effective total tax burden. If the debt increases, they will be compelled to pay taxes at a reduced rate. If the firm has an excessive amount of debt, it may find itself having to pay the charges associated with filing for bankruptcy. According to Dudley (2007) for companies to maximize their company value, they need to balance the tax advantages of their debt and the dangers of going bankrupt. This may be accomplished by analyzing the relationship between the two. This indicates that businesses need to establish a target leverage ratio. This is further verified by Kayhan ( 2007) who says that successful companies are better positioned to profit from tax benefits, and prosperous enterprises may be seen as less hazardous. This is another piece of evidence that supports the first statement. This adds one more bit of supporting evidence to the presented argument before. This illustrates that there is a correlation between leverage and profitability.

## 2.4 Structural Models of Capital Structure

The following is the primary form of state-space that may be used to the explanation of any current models of capital structure structural components:

$$d\mathbf{x} = \boldsymbol{\mu}(\mathbf{x}, t)dt + \boldsymbol{\sigma}(\mathbf{x}, t)d\mathbf{B}, \text{-----} \text{State evolution}$$

$$\mathbf{y} = \mathbf{f}(\mathbf{x}; \boldsymbol{\phi}) + \boldsymbol{\eta}. \text{-----} \text{Observation equation}$$

The state vector,  $\mathbf{x}$ , is the only source of shocks from the outside environment that the model experiences. It means that determining (or obtaining an agreement) the homogeneity of economic events, for example, is necessarily difficult. Welch (2004) provides an original contribution to the literature by relying on market-value-based leverage shocks generated by stock price variations, such as equity value changes and extraordinarily large corporate investments. The International Monetary Fund defines exogenous shocks as "sudden events outside the control of the authorities that [have] a significant negative impact on the economy" Geithner (2003). They conceptualize crises by emphasizing the external origin of the shock-generating event. and follows an Itô procedure involving drift for example leverage drifts too far from optimum even ,  $\boldsymbol{\mu}(\cdot)$ , as well as volatility ,  $\boldsymbol{\sigma}(\cdot)$ , The statistical measurement of volatility is the difference in the returns on a security or a market index. In most circumstances, an asset is riskier the more volatile it is . Another method to describe volatility is the standard deviation or variance of returns from the same assets or market index . The both of which will be influenced in some way by the current time,  $t$ , as well as the

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state that company  $I$  is in at the current moment  $t$ . For each instant in time, a vector of outcome variables is shown before us,  $y_{it}$ , this is something that is determined by the underlying condition as well as a variety of external circumstances  $\phi$ . This function's development,  $f(\cdot)$ , is the model's bread and butter. The noise of observation,  $\eta_{it}$ , is also not usually included in the model, however, should be included for reasons which become evident later. In addition, the parameter vector  $\theta$  is defined by us for the sake of notational ease, as a set of parameters in the development of the state evolution (for example, drift, volatility, and mean reversion speed) as well as the observation equations,  $\phi$ .

The most significant capital structure models that have been suggested in the academic literature are discussed below in Table 2.1. We first determine the state variable, then the observed variables, and then the exogenous components involved in each model. For example, in the model developed by Merton (1974) the value of the company's assets is the state variable, and this value evolves according to a Geometric Brownian Motion.

**Table 2.1: The state variable ( $x_{it}$ ), the form of the state development, the observed variables ( $y_{it}$ ), and the exogenous factors ( $\phi$ )**

| Model             | $x_{it}$                         | State evolution             | $y_{it}$                                                                                                                                  | $\phi$                                                                                                                                                                                                                                |
|-------------------|----------------------------------|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (Merton, 1974)    | Market value of assets           | Brownian Motion in Geometry | Debt market value<br>Stock market capitalization                                                                                          | Debt payback<br>The stated amount of a debt<br>The rate that assumes no risk.                                                                                                                                                         |
| (Mauer, 1994)     | Price of a commodity             | Brownian Motion in Geometry | Interest rate on debt<br>Total net debt issuance<br>Production choice (yes or no)                                                         | The risk-free rate<br>Corporate taxation<br>The expense of bankruptcy<br>Recap price (fixed and proportional)<br>Costs of production<br>Time frame for investment<br>Price of salvage<br>Convenience pays off<br>Adj. operating costs |
| (Leland, 1994)    | Market value of unlevered assets | Brownian Motion in Geometry | Interest rate on debt<br>Market value of debt<br>Market capitalization of stocks                                                          | Interest rate on debt<br>Market value of debt<br>Market capitalization of stocks                                                                                                                                                      |
| (Goldstein, 2001) | EBIT                             | Brownian Motion in Geometry | Interest rate on debt<br>Market value of debt<br>Market capitalization of stocks                                                          | The risk-free rate<br>Corporate taxation<br>Personal income tax rate<br>The expense of bankruptcy                                                                                                                                     |
| (Hennessy, 2005)  | Shock to productivity            | Gaussian in discrete time   | EBIT<br>Face value of a debt<br>Book value of assets<br>The market capitalization of stocks<br>issuance of net equity capital investments | The risk-free rate<br>Schedule of corporate tax rates (2 parameters)<br>Dividend taxation<br>Rate of interest tax<br>Rate of depreciation<br>Cost of a fire sale<br>Return to scale of EBIT                                           |

The variable  $x_{it}$  represents the EBIT of the corporation in the model that Goldstein (2001). In many other models, the state is handled as if it were an unobservable variable.

## 2.5 Business Performance

The success of enterprises may be measured, which is a topic that is gaining a lot of attention in the recent years. Many different measures are taken into account while performance is being analyzed. They distinguish themselves from one another depending on the specific aspect of a sound financial condition that they give the most weight. Within the scope of this study, we look at how the capital structure of a firm relates to its overall success. It is recommended that the definition of performance be modelled after the one offered by the European Foundation for Quality Management EFQM (1999). According to one definition of performance, it is:

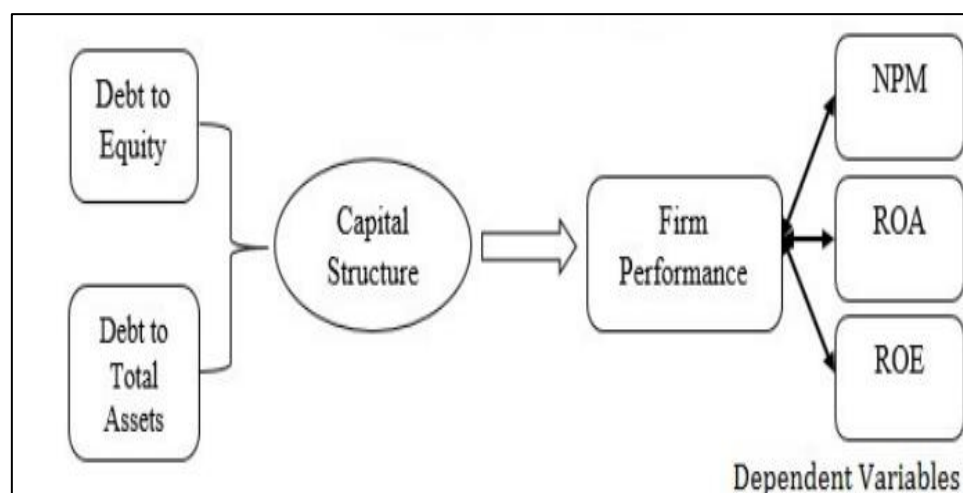
*"the degree to which outcomes are realized by people, groups, or organizations."*

This definition may apply to companies as well as individuals", organizations, and processes." This definition should serve as the basis for the definition of performance. This definition ought to serve as the foundation around which the concept of performance is constructed. Some authors believe that performance can be best understood as the process of determining the core of an organization's existence in a market context and then connecting that core to a company's level of commercial success and its ability to persist. This view is supported by the fact that performance is best understood as the process of determining the core of an organization's existence in a market context. According to Taouab (2019) measuring a company's performance based on the amount of profit it generates is the most common method.

## 2.6 The Influence of Capital Structure on Business Performance

Both theoretical investigations of capital structure and empirical research into the subject have produced contradictory results about the effect that capital structure has on the performance of businesses. This is the case regardless of whether the research was conducted theoretically or empirically. According to the agency costs theory, increasing leverage might decrease the frequency of arguments that arise between shareholders and management. This would be consistent with the findings of the idea. Because the shareholders and management work together on business choices and have the same priorities on what is best for the firm, this will improve the business's overall performance. This theory proposes that leverage lowers the agency costs associated with stock and increases the value of a firm by encouraging managers to act more beneficially to the company's shareholders. Additionally, this theory proposes that leverage increases the value of a firm by encouraging managers to work more in a manner that is beneficial to the firm's employees. Increasing power to a point where there is no longer a financial emergency may make it possible to cancel the expenses associated with the rising interest rates charged by debt collection agencies.

Figure 2.3: An illustration of some of the effects of the capital structure on business performance



Source: Nasimi (2018)

## 2. THE EFFECT OF CAPITAL STRUCTURE MODELING ON BUSINESS PERFORMANCE

In order to understand how capital structure influences business performance, numerous studies have been done. Abor conducted a five-year study (1998–2002) on how capital structure affects firm profitability on the Ghana Stock Exchange (GSE) (2005). Multiple egression analysis is used to estimate the model that connects the return on equity (ROE) variable to the capital structure. According to the research, there is a positive relationship between ROE and the ratio of short-term debt to total assets. The ratio of long-term debt to total assets, however, is inversely related to ROE.

Ebaid (2009) looked into how capital structure choices affected Egyptian firms' performance. From 1997 through 2005, I examined the actions of non-financial state companies listed on the Egyptian Stock Exchange. In order to ascertain the relationship between leverage and business performance, multiple regression analysis was performed. The capital structure is defined by the ratios of short-term debt to total assets (STD), long-term debt to total assets (LTD), and total debt to total assets (TDTA) (TTD). Firm size (LogS) is a control variable that is also present. The findings indicate that the choice of capital structure has little to no bearing on firm success.

The capital structure and capital cost relationship was initially proposed by Durand in 1952. He takes into account net operating income (NOI) and net income as two methods of appraisal for economies with and without taxes (NI). Using the NOI technique, he asserts (tax-free) that capital structure decisions have no bearing on business value (debt to equity). He asserts that the amount of debt in the capital structure at a specific cost of capital is positively correlated with business value under NI (no tax). It suggests declaring bankruptcy is the wisest course of action.

However, he claims that when there is no NI (no tax), the amount of debt in the capital structure at a given cost of capital is positively related to firm value. It implies that filing for bankruptcy is the best option.

In 1958, Modigliani and Miller proposed a cost of equity formula and theorized how capital structure choices affect firm value. They provide two propositions on capital structure theory in an ideal world (no taxes or other economic frictions): proposition I and proposition II. According to Proposition I, the firm's value has nothing to do with its capital structure decisions. In addition, proposition II asserts that the cost of equity

is related to capital structure decisions (debt to equity); the average weighted capital cost (WACC).

In its most general meaning, the primary emphasis of business performance assessment is an analysis of an organization's potential to achieve its objectives most productively feasible. The method of fundamental and technical analysis, which places a value on the company in terms of the economy based on an in-depth study and examination of financial statements, is the method of analyzing business performance used the majority of the time. This method places a value on the company based on an in-depth study and examination of fundamental data Palepu (2020). The vast majority of Slovak and international author Bontis (2001) think that financial indicators, which also include indicators of capital structure, are the instruments that are utilized in the process of measuring the performance of companies the most frequently. These traditional indicators reflect the significant operations of the firm in terms of profitability, capacity to pay, and investment area in terms of value for investors.

It should be noted that traditional financial measurements have a low predictive value in measuring and evaluating the company's financial performance in terms of making tactical and strategic management decisions. This is something that should be remembered. This is because the purpose is to not only measure but also enhance performance, as mentioned in the argument that the goal is to measure and improve performance. Kaplan (2009). This is due to the fact that these outcomes are evaluated independently of one another. Conventional performance indicators do not address why the overall results are at such levels or which aspects of the firm need to be addressed in order to meet strategic corporate objectives. This is because conventional performance indicators do not consider the interrelationships between the various aspects of the company. As a result of this, it is of the utmost importance to supplement the conventional financial indicators with more dynamic and perspective indications, as well as indicators adapted to certain kinds of competitive contexts. Hands that are adapted to certain types of competitive contexts include:

Conditions. It means focusing on monitoring and comparing the implementation results, describing performance in comparison to the level of performance that was planned, and monitoring the direction of the strategy. At the same time, it is being implemented, identifying accompanying problems of fundamental importance and putting into action the changes and improvements required.

The primary concentration of effort put into creating current performance indicators is on the processing and production of hands that are most directly tied to share value. These indicators should also offer the use of the majority of accounting information and data, calculation of risk, assessment of the range of linked capital, and, lastly, performance evaluation and determination of company value (Glykas, 2011), according to Rappaport (2006) even though every shareholder anticipates profitability adequate to the level of risk, claim that when evaluating the success of a company from the perspective of its shareholders, the evaluation centres on the return on money invested in the company. This is the case even though the return on capital invested in the company is the primary criterion.

According to Zeghal (2010) the core financial sectors of assessing and measuring a firm's performance may be complemented by more current and contemporary indicators and methodologies. This is something that can be done both quantitatively and qualitatively. Specifically, assessment utilizing current methods with the use of market features such indicators WACC, INEVA MVA, EVA, RONA, or indicators

based on CVA, FCF, and others may be used to augment the primary financial fields of evaluation and measurement. These indicators include: Economic Value Added is the best tool for performance evaluation among these metrics because it considers the effect of the capital structure via the capital structure risk and is used for assessing the cost of equity. Economic value added is the best tool for performance evaluation among these metrics.

### **3. METHODOLOGY**

#### **1.1 Objectives of the Study**

The power of a company's capital structure is what makes it so important. It has an impact on a company's actual production decisions, and the firm's ability to meet the needs of its stakeholders is intimately linked to capital. Clarifying the importance of determining the optimal financial structure for companies and institutions that contributes to maximizing the value of the company by improving performance and then achieving its objectives, as well as demonstrating the financial risks that it can provide to companies, and identifying and reducing them. The approach analysis is clarified in this work.

The research aims to explain the concept of the economic value-added model as a new basic entry for the financial scale. as well as its features and determinants of its use as a measure of performance and the steps of unit management and its calculation

The purpose of this study was to investigate the effect of capital structure on company performance.

#### **1.2 Importance of the Study**

The study aims to achieve the following:

1. Examine the influence of the company's capital structure on its overall performance and profitability.
2. In order to generalize and detail the results, an examination of the capital structure of the chosen sector is carried out.
3. To examine the correlations between selected capital structure variables and company performance, the following steps are taken.
4. Correlation analysis, which involves assessing the influence of chosen independent factors on company performance via the use of statistical techniques such as regression and principal component analysis. In accordance with the outcomes of the previous step.
5. The importance of the research comes through the use of the measure of economic value added and its impact on the performance of companies.

#### **1.3 Data and Limitations of the Study**

Specifically, this study aims to determine the impact of capital structure modelling on the business performance of firms in Turkey. A representative sample of 6 businesses in the Turkey worker in the cement industry was selected for this study.

A cross-section of 6 firms and a three-year time series are used in this study from 2019 to 2021. When determining the values of different variables in EXCEL tables, the raw data received from the audited annual financial reports are utilized as a starting point. In this study, several types of statistical software, such as SPSS, ensure that the data and conclusions are valid and that the results are compared. It follows that doing an essential correlation analysis between different variables using the selected dataset is credible, and it has the potential to provide fair and dependable findings. Table 4.1 shows the Turkish companies under investigation.

Table 4.2: Turkish companies under investigation

| The Company's name | The field you work in |
|--------------------|-----------------------|
|--------------------|-----------------------|

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|   |                                               |        |
|---|-----------------------------------------------|--------|
| 1 | AFYON ÇİMENTO SANAYİ T.A.Ş.                   | Cement |
| 2 | AKÇANSA ÇİMENTO SANAYİ VE TİCARET A.Ş.        | Cement |
| 3 | BASTAS BASKENT CİMENTO SANAYİ VE TİCARET A.Ş. | Cement |
| 4 | BATIÇİM BATI ANADOLU ÇİMENTO SANAYİİ A.Ş.     | Cement |
| 5 | BATISÖKE SÖKE ÇİMENTO SANAYİİ T.A.Ş.          | Cement |
| 6 | BURSA ÇİMENTO FABRİKASI A.Ş.                  | Cement |

The study included the use of the data provided by the firms for the period 2019-2021. In terms of its capital structure, the firm is funded by equity, and it does not have any long-term obligations.

## 1.4 Method of the Study

In this particular piece of work, we determined performance by using the Economic Value Added (EVA) measure, which is now the one that is both the most well-known and the most generally utilized. This particular type has been in circulation ever since the 1980s. The major purpose of the EVA model is to compute the economic profit of the corporation. Since 1989, the EVA model has seen widespread use. The EVA Equity model and the EVA Entity model were used in our performance calculations. The Economic Value Set to add may be stated in two different ways, according to Formula (1).

$$EVA_{Equity} = (ROE - r_e) \times E \quad \dots\dots\dots (1)$$

*E* stands for Equity.

*ROE* stands for Return on Equity.

*EVA* stands for Economic Value Added.

*r<sub>e</sub>* is the rate of alternative cost of equity.

The concept often referred to as a single equation represents the Spread (*ROE - r<sub>e</sub>*), It is an illustration of the related *EVA / E*. The relative *EVA* contribution to the correlation matrix in the form of an input

The following formula is used to calculate EVA Entity:

$$EVA_{Equity} = NOPAT - WACC \times C \quad \dots\dots\dots (2)$$

The acronyms "NOPAT," "WACC," and "C" stand for "Net Operating Profit after Tax," "Weighted Average Cost of Capital," and "Paid Capital," respectively. The following is the formula that is used to get the Weighted Average Cost of Capital (WACC):

$$WACC = r_a \times (1 - d) \times \frac{d}{c} + r_e \times \frac{E}{C} \quad \dots\dots\dots (3)$$

In which *r* stands for the cost of debt, *d* for the appropriate income tax rate for the company being studied, and *D* for the market value of the interest-bearing debt that has been invested in the business (interest-bearing). We employed CAPM with the acceptance of market, external, and systemic risks to calculate the cost of equity.

$$r_{e\text{ CAPM}} = r_f + \beta \times ERP + CRP \quad \dots\dots\dots (4)$$

Here, *r<sub>f</sub>* refers to the risk-free rate of return.; *ERP* is for the equity risk premium of the market; stands for the coefficient of systematic risk, and *CRP* is the country risk premium Damodaran (2001). When applied to the computation of the cost of equity, this formula will provide the outcomes sought.

We used the Build-up model to compute the cost of equity so that we could compare and contrast performance results and the influence risks have on performance. Our goals were to analyze and compare performance outcomes. . When using the Build-up model, the following considerations are applied to the problem of determining the appropriate interest rate:

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The rate of return on assets that carry no risk is traditionally the return on government bonds, plus any premium for particular risks. The most significant difference between this method and the CAPM is that the Build-up model does not include the coefficient that denotes systematic risk. This is the most critical differential. This is the primary distinction that can be drawn between the two approaches. This strategy, which is built on the ones provided before, may be explained via the use of the formula that is shown below:

$$E(r_i) = r_f + Rp \quad \dots\dots\dots (5)$$

Where  $E(r)$  stands for the cost of equity,  $r_f$  stands for the risk-free rate of return, and  $RP$  is the risk premium, which is made up of a number of different components. It is segmented into business risk aspects, such as market risk, variables pertaining to the size of the organization, and other special features, as well as financial risk elements, such as the risk of cash flow changes. is calculated by using the formula which is as follows:

$$RP = r_b + r_{fin} \quad \dots\dots\dots (6)$$

In this equation, the risk premium related to business risk is denoted by the letter  $r_b$ . In contrast, the letter  $r$  represents the risk premium connected with financial peril.

Due to the consistency of the data, we used the indicator known as Spread (EVAE) as our relative performance measure. The correlation matrix as well as the Principal Component Analysis both made use of this indicator.

When the firm's performance was evaluated using EVA Equity and the indicator Spread, it was found that the company's performance had been negative for the great majority of the years that were taken into account (Table 4.2). The difficulty of establishing the cost of equality was solved by applying the CAPM model to the situation, and the results were included in the computation.

**Table 4.3: Improving the performance of Turkish companies**

| Turkish company names |                                               | 2019               | 2020     | 2021     |
|-----------------------|-----------------------------------------------|--------------------|----------|----------|
| 1                     | AFYON ÇİMENTO SANAYİ T.A.Ş.                   | $EVA_{EquityCAPM}$ | -412,640 | -790,880 |
|                       |                                               | Spread             | -0.03    | -0.06    |
| 2                     | AKÇANSA ÇİMENTO SANAYİ VE TİCARET A.Ş.        | $EVA_{EquityCAPM}$ | 750,440  | -883,280 |
|                       |                                               | Spread             | -0.06    | -0.07    |
| 3                     | BASTAS BASKENT CİMENTO SANAYİ VE TİCARET A.Ş. | $EVA_{EquityCAPM}$ | 410,630  | 295,320  |
|                       |                                               | Spread             | -0.03    | -0.02    |
| 4                     | BATIÇİM BATI ANADOLU ÇİMENTO SANAYİİ A.Ş.     | $EVA_{EquityCAPM}$ | -292,500 | 700,920  |
|                       |                                               | Spread             | -0.02    | -0.06    |
| 5                     | BATISÖKE SÖKE ÇİMENTO SANAYİİ T.A.Ş.          | $EVA_{EquityCAPM}$ | -398,440 | 545,490  |
|                       |                                               | Spread             | -0.03    | -0.04    |
| 6                     | BURSA ÇİMENTO FABRİKASI A.Ş.                  | $EVA_{EquityCAPM}$ | -250,110 | -510,320 |
|                       |                                               | Spread             | -0.02    | -0.04    |
|                       |                                               | Spread             | -0.07    | -0.01    |

We have decided on the ratio of equity to fixed assets, the ratio of total debt to total assets, the ratio of equity to debt, the ratio of current obligation to total assets, as capital structure metrics, interest coverage and financial leverage are used. Because of the strong association between these measures and the company's financial structure, we determined that integrating these data as contributors to the correlation matrix was the appropriate course of action. This is due to the strong relationship that exists between these measures and the company's financial structure. Table 4.3 presents the results made on the values of the selected indicators for your consideration.

**Table 4.4: Selected Capital Structure Indicators for Turkish Companies**

| Turkish company names |  | TD/TA | E/TD | Financial | Interest | E/FA | CL/TA |
|-----------------------|--|-------|------|-----------|----------|------|-------|
|-----------------------|--|-------|------|-----------|----------|------|-------|

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|   |                                               |      |      |      | leverage | Coverage  |      |      |
|---|-----------------------------------------------|------|------|------|----------|-----------|------|------|
| 1 | Afyon Çimento Sanayi T.A.Ş.                   | 2019 | 0.23 | 3.48 | 1.45     | 89.58     | 1.95 | 0.22 |
|   |                                               | 2020 | 0.24 | 3.77 | 1.42     | 120.22    | 2.21 | 0.21 |
|   |                                               | 2021 | 0.2  | 5.14 | 1.33     | 150.71    | 2.34 | 0.17 |
| 2 | Akçansa Çimento Sanayi Ve Ticaret A.Ş.        | 2019 | 0.17 | 5.63 | 1.32     | 893.63    | 2.5  | 0.15 |
|   |                                               | 2020 | 0.22 | 3.48 | 1.45     | 83.58     | 1.95 | 0.22 |
|   |                                               | 2021 | 0.24 | 4.02 | 1.4      | 114935.4  | 2.51 | 0.22 |
| 3 | Bastas Baskent Çimento Sanayi Ve Ticaret A.S. | 2019 | 0.19 | 5.13 | 1.32     | 150.7     | 2.33 | 0.16 |
|   |                                               | 2020 | 0.16 | 5.62 | 1.31     | 883.62    | 2.49 | 0.14 |
|   |                                               | 2021 | 0.21 | 3.47 | 1.45     | 109.57    | 1.94 | 0.21 |
| 4 | Batıçim Batı Anadolu Çimento Sanayii A.Ş.     | 2019 | 0.23 | 4.01 | 1.39     | 114935.39 | 2.5  | 0.21 |
|   |                                               | 2020 | 0.21 | 3.47 | 1.44     | 35387.98  | 2.63 | 0.23 |
|   |                                               | 2021 | 0.16 | 5.57 | 1.31     | 69512.47  | 2.67 | 0.16 |
| 5 | Batisöke Söke Çimento Sanayii T.A.Ş.          | 2019 | 0.19 | 5.13 | 1.32     | 150.7     | 2.33 | 0.16 |
|   |                                               | 2020 | 0.22 | 3.47 | 1.43     | 89.57     | 1.94 | 0.21 |
|   |                                               | 2021 | 0.24 | 3.76 | 1.41     | 120.21    | 2.2  | 0.2  |
| 6 | Bursa Çimento Fabrikası A.Ş.                  | 2019 | 0.18 | 5.12 | 1.31     | 150.69    | 2.32 | 0.15 |
|   |                                               | 2020 | 0.15 | 5.61 | 1.3      | 883.61    | 2.48 | 0.13 |
|   |                                               | 2021 | 0.24 | 3.46 | 1.43     | 89.56     | 1.93 | 0.2  |

CL current liabilities, TD total debt indicates, E equity, TA overall assets and FA Index of Fixed Assets

The indicators provided by the business's capital structure lead to an average level of indebtedness for the company, 22 percent. This debt is the direct result of being required to meet several obligations within a shorter time frame. The corporation's relatively low number of interests contributes to the relatively high-interest coverage values. The company has a very high equity-to-debt ratio and an excessive quantity of accessible capital, a high degree of financial leverage, and a high degree of financial leverage. These qualities are beneficial for ensuring the company's continuity, and they should be considered while making hiring decisions. However, it is essential to note that these principles have a detrimental effect on the organization's profitability, one of the most critical factors in achieving success. It is important to note that these principles hurt the organization's profitability.

Table 4.5: Correlation matrix for Afyon Çimento Sanayi T.A.Ş.

|                    |    | TD/TA   | E/TD    | Monetary leverage | Coverage of Interest | E/FA    | CL/TA   | EVA/E   |
|--------------------|----|---------|---------|-------------------|----------------------|---------|---------|---------|
| TD/TA              |    | 1.0000  | -0.9981 | 0.9999            | -0.0170              | -0.4610 | 0.9787  | 0.2442  |
|                    | P= | ---     | 0.000   | 0.000             | 0.985                | 0.406   | 0.002   | 0.655   |
| E/TD               |    | -0.9981 | 1.0000  | -0.9954           | -0.1220              | 0.4564  | -0.9638 | -0.2651 |
|                    | P= | 0.000   | ---     | 0.000             | 0.979                | 0.303   | 0.000   | 0.566   |
| Financial leverage |    | 0.9999  | -0.9954 | 1.0000            | -0.2300              | -0.4535 | 0.9581  | 0.2225  |
|                    | P= | 0.000   | 0.000   | ---               | 0.961                | 0.307   | 0.001   | 0.632   |
| Interest coverage  |    | -0.0170 | -0.1220 | -0.0230           | 1.0000               | 0.5659  | 0.1688  | 0.1551  |
|                    | P= | 0.975   | 0.979   | 0.961             | ---                  | 0.185   | 0.717   | 0.740   |
| E/FA               |    | -0.4641 | 0.4564  | -0.4535           | 0.5659               | 1.0000  | -0.2105 | -0.1179 |
|                    | P= | 0.306   | 0.303   | 0.307             | 0.185                | ---     | 0.650   | 0.801   |
| CL/TA              |    | -0.9787 | -0.9638 | 0.9589            | 0.1688               | -0.2105 | 1.0000  | 0.2128  |
|                    | P= | 0.001   | 0.000   | 0.001             | 0.717                | 0.650   | ---     | 0.647   |
| EVA/E              |    | 0.2442  | -0.2651 | 0.2225            | 0.1551               | -0.1170 | 0.2128  | 1.0000  |
|                    | P= | 0.632   | 0.615   | 0.566             | 0.140                | 0.801   | 0.647   | ---     |

We evaluated the degree to which different capital structure indicators were connected with the relative performance measure spread by using a correlation matrix built in the program Statistica. To do this, we looked at the relationship between the two (Tables 4.4 to 4.15 ). The correlations whose corresponding P values were lower than the

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significance threshold of 0.05 were highlighted in the correlation matrix. This was done so that the reader may quickly identify these correlations. While finding the value of the correlation coefficient, we used the Cohen (1998) scale, which takes into account the absolute magnitude of the correlation. This allowed us to arrive at an accurate result.

If the value of the correlation coefficient is more significant than 0.5, then the connection is considered to be strong; if the value is between 0.3 and 0.5, then it is deemed to be a moderate correlation; if the value is between 0.1 and 0.3, then it is considered to have a weak correlation; and if the value is less than 0.1, then it is deemed to be a trivial association.

Table 4.4 shows that the relationship between EVA and the debt and equity ratios is statistically significant. When it comes to the indicator debt ratio, the relationship is directly proportional.

Table 4.6: Correlation matrix for Akçansa Çimento Sanayi Ve Ticaret A.Ş.

|                    |    | TD/TA   | E/TD    | Financial leverage | Interest coverage | E/FA    | CL/TA   | EVA/E   |
|--------------------|----|---------|---------|--------------------|-------------------|---------|---------|---------|
| TD/TA              |    | 1       | -0.8981 | 0.9898             | -0.087            | -0.321  | 0.8887  | 0.232   |
|                    | P= | ---     | 0       | 0                  | 0.985             | 0.406   | 0.002   | 0.655   |
| E/TD               |    | -0.8981 | 1       | -0.9954            | -0.122            | 0.4564  | -0.9638 | -0.2651 |
|                    | P= | 0       | ---     | 0                  | 0.979             | 0.303   | 0       | 0.566   |
| Financial leverage |    | 0.9898  | -0.9954 | 1                  | -0.23             | -0.4535 | 0.9581  | 0.2225  |
|                    | P= | 0       | 0       | ---                | 0.961             | 0.307   | 0.001   | 0.632   |
| Interest coverage  |    | -0.087  | -0.122  | -0.023             | 1                 | 0.5659  | 0.1688  | 0.1551  |
|                    | P= | 0.985   | 0.979   | 0.961              | ---               | 0.185   | 0.627   | 0.1     |
| E/FA               |    | -0.321  | 0.4564  | -0.4535            | 0.5659            | 1       | -0.2105 | -0.1179 |
|                    | P= | 0.306   | 0.303   | 0.303              | 0.185             | ---     | 0.65    | 0.801   |
| CL/TA              |    | 0.8887  | -0.9638 | 0.9589             | 0.1688            | -0.2105 | 1       | 0.2128  |
|                    | P= | 0.001   | 0       | 0.001              | 0.627             | 0.65    | ---     | 0.647   |
| EVA/E              |    | 0.232   | -0.2651 | 0.2225             | 0.1551            | -0.117  | 0.2128  | 1       |
|                    | P= | 0.615   | 0.566   | 0.632              | 0.14              | 0.801   | 0.647   | ----    |

Table 4.5 indicates that the association between EVA and the debt and equity ratios was statistically significant. The indication equity and debt ratios have a direct proportional link, whereas the indicator equity and debt ratios have an indirect proportional relationship.

Table Error! No text of specified style in document..7: Correlation matrix for Bastas Baskent Cimento Sanayi ve Ticaret A.S.

|                      |    | TD/TA   | E/TD    | Monetary leverage | Coverage of Interest | E/FA    | CL/TA   | EVA/E   |
|----------------------|----|---------|---------|-------------------|----------------------|---------|---------|---------|
| TD/TA                |    | 1.0000  | -0.7959 | 0.8899            | -0.0270              | -0.6610 | 0.8187  | 0.2142  |
|                      | P= | ---     | 0.000   | 0.000             | 0.985                | 0.406   | 0.002   | 0.655   |
| E/TD                 |    | -0.7959 | 1.0000  | -0.8854           | -0.1220              | 0.4564  | -0.9638 | -0.2651 |
|                      | P= | 0.000   | ---     | 0.000             | 0.979                | 0.303   | 0.000   | 0.566   |
| Monetary leverage    |    | 0.8399  | -0.8854 | 1.0000            | -0.2300              | -0.4535 | 0.8521  | 0.2225  |
|                      | P= | 0.000   | 0.000   | ---               | 0.961                | 0.307   | 0.001   | 0.632   |
| Coverage of Interest |    | -0.0270 | -0.1220 | -0.0230           | 1.0000               | 0.5659  | 0.1688  | 0.1551  |
|                      | P= | 0.975   | 0.979   | 0.961             | ---                  | 0.185   | 0.717   | 0.740   |
| E/FA                 |    | -0.6641 | 0.4564  | -0.4535           | 0.5659               | 1.0000  | -0.2105 | -0.1179 |
|                      | P= | 0.306   | 0.303   | 0.307             | 0.185                | ---     | 0.650   | 0.801   |
| CL/TA                |    | -0.8187 | -0.9638 | 0.9589            | 0.1688               | -0.2105 | 1.0000  | 0.2128  |
|                      | P= | 0.001   | 0.000   | 0.001             | 0.717                | 0.650   | ---     | 0.647   |
| EVA/E                |    | 0.2142  | -0.2651 | 0.2225            | 0.1551               | -0.1170 | 0.2128  | 1.0000  |
|                      | P= | 0.615   | 0.566   | 0.632             | 0.140                | 0.801   | 0.647   | ----    |

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Table 4.6 showed how significantly EVA and the debt and equity ratios correlated statistically. In contrast to the indirect proportional link between the indicator equity ratio and the indicator debt ratio, there is a direct proportional relationship between the indicator equity ratio and the indicator debt ratio.

Table Error! No text of specified style in document.:8: Correlation matrix for Batıçim Batı Anadolu Çimento Sanayii A.Ş.

|                    |    | TD/TA   | E/TD    | Monetary leverage | Coverage of Interest | E/FA    | CL/TA   | EVA/E   |
|--------------------|----|---------|---------|-------------------|----------------------|---------|---------|---------|
| TD/TA              |    | 1.0000  | -0.8932 | 0.8966            | -0.0240              | -0.4622 | 0.8456  | 0.1522  |
|                    | P= | ---     | 0.000   | 0.000             | 0.985                | 0.406   | 0.002   | 0.655   |
| E/TD               |    | -0.8932 | 1.0000  | -0.9954           | -0.1220              | 0.4564  | -0.9638 | -0.2651 |
|                    | P= | 0.000   | ---     | 0.000             | 0.979                | 0.303   | 0.000   | 0.566   |
| Financial leverage |    | 0.8966  | -0.6654 | 1.0000            | -0.2300              | -0.4535 | 0.6666  | 0.2225  |
|                    | P= | 0.000   | 0.000   | ---               | 0.961                | 0.307   | 0.001   | 0.632   |
| Interest coverage  |    | -0.0240 | -0.1220 | -0.0230           | 1.0000               | 0.5659  | 0.1688  | 0.1551  |
|                    | P= | 0.975   | 0.979   | 0.961             | ---                  | 0.185   | 0.717   | 0.740   |
| E/FA               |    | -0.4622 | 0.4564  | -0.4535           | 0.5659               | 1.0000  | -0.2105 | -0.1179 |
|                    | P= | 0.306   | 0.303   | 0.307             | 0.185                | ---     | 0.650   | 0.801   |
| CL/TA              |    | 0.8456  | -0.7654 | 0.5245            | 0.1688               | -0.2105 | 1.0000  | 0.2128  |
|                    | P= | 0.001   | 0.000   | 0.001             | 0.717                | 0.650   | ---     | 0.647   |
| EVA/E              |    | 0.1522  | -0.2651 | 0.2225            | 0.1551               | -0.1170 | 0.2128  | 1.0000  |
|                    | P= | 0.615   | 0.566   | 0.632             | 0.140                | 0.801   | 0.647   | ----    |

The association between EVA and the debt and equity ratios was shown to be statistically significant by Table 4.7 . When it comes to the indicator debt ratio, the relationship is directly proportional; however, when it comes to the indicator equity ratio, the relationship is indirectly proportional.

Table 4.9: Correlation matrix for Batisöke Söke Çimento Sanayii T.A.Ş.

|                    |    | TD/TA   | E/TD    | Monetary leverage | Coverage of Interest | E/FA    | CL/TA   | EVA/E   |
|--------------------|----|---------|---------|-------------------|----------------------|---------|---------|---------|
| TD/TA              |    | 1.0000  | -0.7751 | 0.7254            | -0.0201              | -0.4610 | 0.7891  | 0.2891  |
|                    | P= | ---     | 0.000   | 0.000             | 0.985                | 0.406   | 0.002   | 0.655   |
| E/TD               |    | -0.7751 | 1.0000  | -0.9954           | -0.1220              | 0.4564  | -0.9638 | -0.2651 |
|                    | P= | 0.000   | ---     | 0.000             | 0.979                | 0.303   | 0.000   | 0.566   |
| Financial leverage |    | 0.7254  | -0.9334 | 1.0000            | -0.2300              | -0.4535 | 0.9581  | 0.2225  |
|                    | P= | 0.000   | 0.000   | ---               | 0.961                | 0.307   | 0.001   | 0.632   |
| Interest coverage  |    | -0.0201 | -0.1220 | -0.0230           | 1.0000               | 0.5659  | 0.1688  | 0.1551  |
|                    | P= | 0.975   | 0.979   | 0.961             | ---                  | 0.185   | 0.717   | 0.740   |
| E/FA               |    | -0.4641 | 0.4564  | -0.4535           | 0.5659               | 1.0000  | -0.2105 | -0.1179 |
|                    | P= | 0.306   | 0.303   | 0.307             | 0.185                | ---     | 0.650   | 0.801   |
| CL/TA              |    | 0.7891  | -0.9321 | 0.9421            | 0.1688               | -0.2105 | 1.0000  | 0.2128  |
|                    | P= | 0.002   | 0.000   | 0.002             | 0.717                | 0.650   | ---     | 0.647   |
| EVA/E              |    | 0.2891  | -0.2651 | 0.2225            | 0.1551               | -0.1170 | 0.2128  | 1.0000  |
|                    | P= | 0.615   | 0.566   | 0.632             | 0.140                | 0.801   | 0.647   | ----    |

The link between current obligations and total assets is strongly directly proportional linear, as seen in the matrix (Table 4.8). Financial leverage and total debt to total assets have a high, inversely proportional connection. Similar to this, there is a significant, albeit indirect, proportional link between equity and debt.

Table 4.10: Correlation matrix for Bursa Çimento Fabrikası A.Ş.

|       |    | TD/TA   | E/TD    | Monetary leverage | Coverage of Interest | E/FA    | CL/TA   | EVA/E   |
|-------|----|---------|---------|-------------------|----------------------|---------|---------|---------|
| TD/TA |    | 1.0000  | -0.7954 | 0.9812            | -0.0170              | -0.4610 | 0.8887  | 0.2442  |
|       | P= | ---     | 0.000   | 0.000             | 0.985                | 0.406   | 0.001   | 0.655   |
| E/TD  |    | -0.7954 | 1.0000  | -0.9954           | -0.1220              | 0.4564  | -0.9638 | -0.2651 |

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|                    |    |         |         |         |         |         |         |         |
|--------------------|----|---------|---------|---------|---------|---------|---------|---------|
|                    | P= | 0.000   | ---     | 0.000   | 0.979   | 0.303   | 0.000   | 0.566   |
| Financial leverage |    | 0.9812  | -0.9954 | 1.0000  | -0.2300 | -0.4535 | 0.7986  | 0.2225  |
|                    | P= | 0.000   | 0.000   | ---     | 0.961   | 0.307   | 0.002   | 0.632   |
| Interest coverage  |    | -0.0170 | -0.1220 | -0.0230 | 1.0000  | 0.5659  | 0.1688  | 0.1551  |
|                    | P= | 0.975   | 0.979   | 0.961   | ---     | 0.185   | 0.717   | 0.740   |
| E/FA               |    | -0.4641 | 0.4564  | -0.4535 | 0.5659  | 1.0000  | -0.2105 | -0.1179 |
|                    | P= | 0.306   | 0.303   | 0.307   | 0.185   | ---     | 0.650   | 0.801   |
| CL/TA              |    | -0.9787 | -0.7738 | 0.7899  | 0.1688  | -0.2105 | 1.0000  | 0.2128  |
|                    | P= | 0.002   | 0.000   | 0.002   | 0.717   | 0.650   | ---     | 0.647   |
| EVA/E              |    | 0.2442  | -0.2651 | 0.2225  | 0.1551  | -0.1170 | 0.2128  | 1.0000  |
|                    | P= | 0.615   | 0.566   | 0.632   | 0.140   | 0.801   | 0.647   | ---     |

The association between EVA and the debt and equity ratios was shown to be statistically significant by the matrix (Table 4-9). When it comes to the indicator debt ratio, the relationship is directly proportional; however, when it comes to the indicator equity ratio, the relationship is indirectly proportional.

According to the matrixs (Tables 4.4 to 4.9), There is a proportionate relationship between the equity to debt ratio and the total debt to total assets and a balanced association between financial leverage and total debt to total assets. In addition, there is a flat association between total debt to total assets and economic power. There is also a proportional link that exists between these two ideas. This relationship is tied to financial leverage and the ratio of total debt to total assets indirectly. In addition, there is a proportionate relationship between total debt to total assets and economic power that operates indirectly. The ratio of current obligations to total assets and the percentage of total debt to total assets have a direct solid proportional , and linear connection. This is because both ratios measure the same thing.

## 4. RESULTS

The computation of the specified indicators indicated that the interest gauge coverage does not connect with any of the hands of the capital structure. This was discovered as a result of the investigation into the capital structure. This was discovered to determine that the interest gauge coverage was one of the designated indicators. On the other hand, when it comes to the company that was looked at, the findings may be skewed because the organization's simple financial structure was not considered. There is the potential for the capital structure indicators to be divided into two distinct categories. Alterations to the capital structure have an effect not only on the value of the EVA indicator but also on Return on Spread, Equity (ROE), Cost of Capital, and Cost of Equity (CoE), as can be seen from the computations of the indicators that go into the quantification of the EVA indicator as well as the calculation of the EVA indicator itself.

This is because the EVA indicator is derived from the computations of the indicators that go into quantifying the EVA indicator (CoC). Alterations to the capital structure also affect Return on Equity, Spread, Cost of Capital, and Cost of Equity. This is because the ROE and Spread indicators are taken into account when measuring the EVA indication. This is the reason why this is the case. This is evidenced by the fact that ROE, Spread, CoE, and CoC are all affected by the E. The computations of the indicators that go into quantifying the EVA indication led to the discovery of this fact. When it comes to CAPM, the cost of capital increases more rapidly when a firm takes on more external risk since this results in a lower level of equity. This is because CAPM assumes that a higher level of risk will lead to a lower level of equity. This occurs because the value of the coefficient rises as the total amount of debt rises, which explains why this phenomenon occurs. As determined by CAPM, the cost of

equity increases at a more rapid rate when the margin value of the capital structure is included. The margin value is forty per cent stock and sixty per cent debt. As an immediate consequence of this fact, the anticipated performance of the EVA indicator improves at a glacially slow rate.

When we calculated it using the Build-up model, we concluded that shifting the capital structure in favour of debt did not significantly increase the cost of equity. We reached this conclusion after deciding that the cost of equity did not increase substantially. This was the conclusion we came to. This was one of the findings we came to when we applied the model. This was the realization that we came to after much deliberation. As a direct and immediate consequence of this, the value of the EVA indicator rises at a quicker pace as time goes on. The regression analysis findings are anticipated to be driven by this same component. Hence this is likewise the driving factor. Additionally, it is essential to consider that the equity component of this model's margin capital structure accounts for sixty per cent, while debt constitutes forty per cent.

We were only effective in verifying the influence of capital structure on performance based on the regression analysis when the Build-up model was used; when the CAPM model was applied, we were not successful. To determine this, the cost of equity approach is used. By analyzing the capital structure indicators, we were able to identify the amount of financial risk associated with the Build-up model.

As a direct result of this fact, the value of the cost of equity correctly represents the scope of their influence. Inside the context of the CAPM, we focused only on external concerns and disregarded any possible threats emanating from within the organization. Nevertheless, to reach this conclusion, it is necessary to begin by simplifying the situation and making some assumptions. The information provided before can lead us to the conclusion that the performance of a business is impacted when changes are made to the organisation's capital structure. It is not conceivable to claim that the CAPM or the Build-up model is more reliable than the other. Both of these models have their strengths and weaknesses. Each of these models is flawed in its unique way. Each acknowledges the hazards from its unique perspective (CAPM looks at risks from an external viewpoint, whereas Build-up focuses on risks from an internal perspective). As a result, we recommend developing a new one that is prepared to take on the risks associated with both options. The outcomes of this study will serve as the foundation for more research, including collecting a more excellent range of data and a more in-depth degree of analysis than was previously conducted.

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## تقييم تأثير نمذجة هيكل رأس المال على أداء عمليات الإنتاج

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### المستخلص ABSTRACT :

يهدف البحث إلى استكشاف تأثير نمذجة هيكل رأس المال على أداء أعمال الإنتاج من أجل التوصل إلى نتيجة. تم جمع البيانات بناءً على مدخلات من ست شركات تركية منتجة للأسمت. ثم تم استخدام تحليل البيانات التي تم جمعها لتحقيق الهدف. تم في الجزء الأول من الدراسة شرح مفهوم هيكل رأس المال، وتمت مناقشة النظريات وهي نظرية عدم الأهمية، ونظرية المقايضة (TOT)، وأنواعها. كما تم تحديد محددات جميع هياكل رأس المال والنماذج الخاصة بالشركة وهيكل رأس المال. أما الجزء الثاني من الدراسة فكان الجزء العملي، حيث تم استخدام البيانات الخاصة بالشركات التركية لتحقيق الهدف. تم إجراء تحليل المدخلات لهيكل رأس المال للقطاع المختار من أجل تعميم وتوضيح الاستنتاجات المتعلقة بهيكل رأس المال للشركات التي تم تحليلها. حيث تكمن المشكلة الأساسية في تحديد مؤشرات هيكل رأس المال التي تؤثر على أداء الأعمال الإنتاجية. تم تقييم الأداء باستخدام مقياس القيمة الاقتصادية المضافة (EVA)، ومصفوفة الارتباط، ومقياس كوهين، وSPSS.

لقد قمنا بتطوير بعض مقاييس هيكل رأس المال للتحقق من الروابط بين هذه المؤشرات والأداء العام للمنظمة. أظهرت نتائج أبحاث الارتباط تحسينات كبيرة باستخدام تحليل الانحدار وتحليل المكونات الرئيسية لدراسة تأثير بعض العناصر غير ذات الصلة على النجاح الشامل للشركة. ونتيجة لذلك، نوصي بتطوير خيار جديد يكون على استعداد لتحمل المخاطر المرتبطة بكلتا الخيارين. ستكون نتائج هذه الدراسة بمثابة الأساس لمزيد من البحث، بما في ذلك جمع المزيد من البيانات ذات الصلة ومجموعة أخرى من التحليلات.

**الكلمات المفتاحية:** هيكل رأس المال، أداء الأعمال، نمذجة رأس المال، دولة تركيا.

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