MODELİNG AND EVALUATİNG CAPİTAL STRUCTURE AND İTS İMPACT ON PRODUCTİVE BUSİNESS PERFORMANCE

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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 research, 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 research 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 research 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.

INTRODUCTION

The measuring of business success is indeed a relevant research area in the the present everchaning 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 Concept Of 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.

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. 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). 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.

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.

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
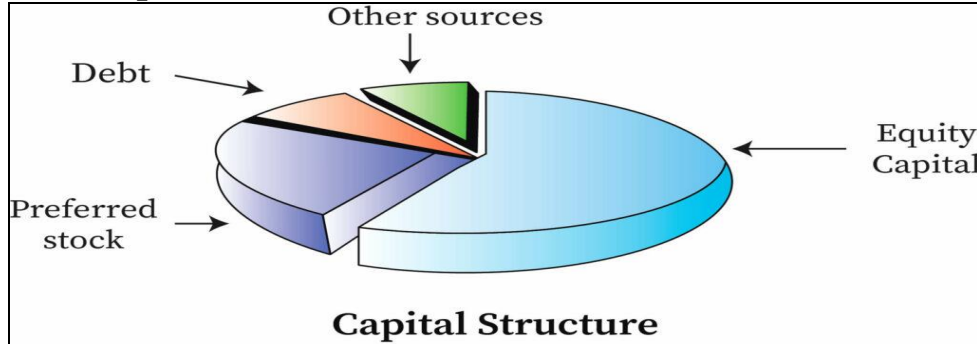
Source: Dhoot (2021)

2.2   Capital Structure Theories

2.2.1 Irrelevence 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. 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. Even though, before the M and M theory, there was no explanation of capital structure well recognized, many individuals disagreed with M and M's thesis. This is because certain presumptions were made in developing this notion, which has led to this result. The first thing that will be assumed is that there aren't any fees connected to financial transactions. The second presumption is that there are no financial obligations involved in submitting a bankruptcy petition. The third presumption is that there are no other charges besides the agency fees. The very last idea is that there is no imbalance in the distribution of information. When examined in light of the actual world, these presumptions are incorrect. Sceptics say that the assumptions that underpin this theory will not stand up in the virtual world because these expenditures are actual for firms. As a result, these individuals have called this theory into doubt. As a direct result of these criticisms and assumptions, new ideas are formed to provide a solution to those criticisms and assumptions. One of the assumptions serves as the basis for these theories, each of which distinctively explains the capital structure. The trade-off theory, the pecking order theory, and the agency costs theory are the three theories that M and M have developed that are used the most often and to the most significant extent. These theories

are in the order of their degree of applicability. A company's capital structure may be understood better by using any one of several different models, all of which are available for use. Harris (1991) analyze a variety of hypotheses to explain the genesis of capital. Using these models, which demonstrated that there are a variety of outcomes, they elucidated the point that they were attempting to make. In specific investigations, the researchers found that the composition of a company's capital structure had a detrimental impact on economic success. However, in other studies, the researchers discovered that the capital structure had a favorable effect on performance.

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. The use of debt up to a particular amount, as stated by Myers (1984) covers the expense of financial hardship and interest tax protection.

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. As the quantity of money that the firm borrows grows, the company's weighted average cost of capital (WACC) will continue to decline until it reaches the ideal gearing level. (Miller, 1988) supports the hypothesis that the debt-to-equity ratio that is best for a firm provides that organization with the most efficient tax shield that is realistically attainable. According to the idea of trade-offs, the price of debt is proportional to the sum of the direct and indirect costs associated with declaring bankruptcy.

Figure 2.1: Trade-off theory (TOT)
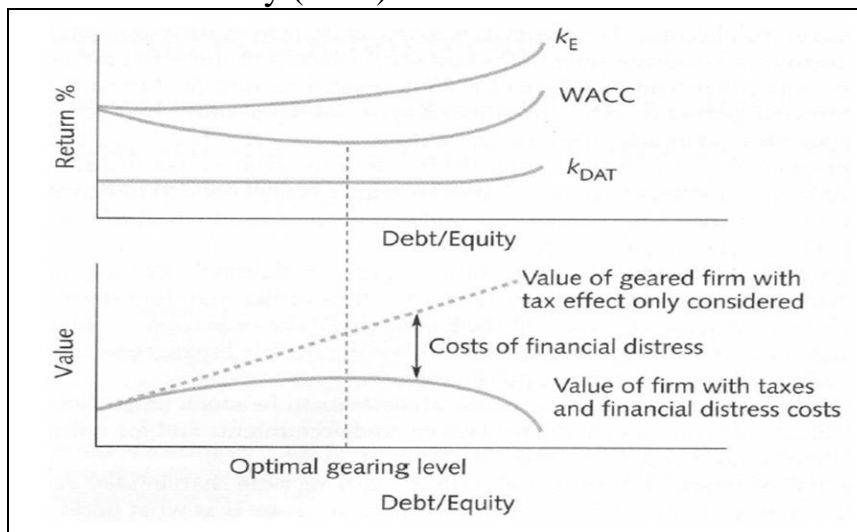
Source: Ghazouani (2013)

Along with the bankruptcy cost, the agency cost developed by Altman (1977) is one of the components that are taken into consideration by the trade-off model. Other considerations include: According to Altman (1977) the split between ownership and control of an agency is the primary motivating factor behind the growth in the costs associated with running the agency. According to Arnold (2008) who defines agency costs as "direct and indirect costs," agency costs are "direct and indirect expenses arising from principles and agents behaving in their best interests and failing to have agents function in this way." This is the definition of agency costs provided by Arnold (2008).

2.2.2.1 Pecking Order Theory

The MandM hypothesis has generated a great deal of debate, and one of the concepts that have surfaced as a result of this discussion is the pecking order theory. Myers (1984) were the first people to present this idea . In contrast, the pecking order theory requires assumptions of this type on the information being exchanged, whereas the MandM theory does not. It is assumed that managers have a more in-depth comprehension of the obstacles, opportunities, and priorities that the organization is now confronting compared to members of the outside community. The investors' responses to the activities of the company's management will depend on whether or not the administration has access to more information than the investors. The price of a firm's shares rises when, for example, the company announces that it will be raising the number of dividends that it pays out. Investors see this growth as proof that management is confident in the company's ability to remain profitable in the future. This confidence is reflected in the expansion.

2.2.2.2 Agency Cost Theory

In 1976, Jensen and Meckling developed the agency costs theory. It is currently regarded as the third major capital structure theory. "A contract in which one or more persons (the principal(s)) hire another person (the agent) to provide a service on their behalf, according to Jensen's (1976) definition of an agency relationship,which involves transferring some decision making authority to the agent," an agency relationship is defined as "a contract in which one or more persons (the principal(s)) engage another person (the agent) to perform a service on their behalf". They claimed that the goals of corporate owners (agents) and managers (principals) are not connected and that managers make decisions based on their personal preferences rather than those that are in the organization's best interest. They also claimed that managers make decisions based on the organization's goals. The total of these three separate fees is meant to be understood when referring to the agency's expenditures. The first item that must be investigated is how the company's leaders spend their money.

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. we will use the theories of the capital structure presented in the preceding paragraph.

2.4   Firm-Specific Capital Structure Determinants

According to Psllaki (2009), variations in a company's capital structure can be explained by characteristics that are exclusive to that company.   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.

According to the pecking order hypothesis, the usage of leverage will have a detrimental influence on the ability of a firm to earn profits. This is because force lowers a company's purchasing power. A company with more access to its internal financial resources will have a decreased dependence on loans obtained from outside parties. Because they do not need funding from external sources, these businesses have a lower demand for bank loans. It has been shown via research carried out by Frank (2002) Serrasqueiro (2015) that this behavior has a negative influence. It is predicted that the impact of debt on a firm's profitability will have a negative effect if the company decides to issue shares. When a firm issues more equity, the price of the company's stock often decreases. The trade-off theory and the agency cost hypothesis are similar in that they both begin with the presumption that there will be a positive outcome. According to Jensen (1986) investments made in a firm that is helpful to management do not necessarily raise the company's value in which the investments are made. The usage of debt by shareholders has the impact of diminishing the firm's free cash flow, which is similarly represented in the free cash flow issue of the agency costs theory. The idea of agency costs is consistent with the trade-off theory, which suggests that when there is uncertainty, the growing value decreases, which means there is a negative consequence. The trade-off theory is compatible with the concept of agency costs. These ideas may be understood in a manner consistent with the concept of agency costs.

2.5   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:

$$dxit = \mu(xit, t)dt + \sigma(xit, t)dBit,$$ ---------------------------- *State evolution*

$$yit = f(xit;\ \phi) + \eta it.$$ ---------------------------- *Observation equation*

The state vector, $Xit,$ 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 $,\mu(\cdot),$ as well as volatility $,\sigma(\cdot),$ 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 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 $,yit,$ this is something that is determined by the underlying condition as well as a variety of external circumstances ϕ. 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 included that for reasons which become evident later. In addition, the parameter vector θ 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, ϕ.

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 (xit), the form of the state development, the observed variables (yit), and the exogenous factors (ϕ)

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

The variable xit 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. For instance, in the model provided by Leland (1994)

the state is defined as the worth of the firm's assets when it does not have any debt. The quantity of production is the variable that Hennessy use to denote the state in their model Hennessy (2005, 2007). The model can zero in on observable characteristics such as leverage, profitability, and capital expenditures, all contained inside the vector yit. This allows the model to pinpoint these aspects. The model makes it possible to determine the values of all of these variables by considering both the existing reality and the model's parameters.

2.6   Business Performance

The success of enterprises may be measured, which is a topic that is gaining a lot of attention in the recen 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.

The organization's capacity to make the most efficient use of its resources. According to Eleburuike (2015), the performance of a business is a quality that reveals how a company carries out a particular activity in a manner that is comparable to how this activity is carried out. Hence, erformance is a measurement of how successfully an organization accomplishes its tasks and duties. Authors such as Frost (2005) that define performance as the capability of an organization to make the most effective use of the assets it has integrated into its company.

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2.7   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.

This will result in a decrease in the agency's costs of equity, which will lead the expenditures to become more balanced. Jensen (1976) considered the growing leverage as an aspect of the strategy to reduce agency costs while he was developing the concept of agency costs. This approach aims to lower agency costs. This is particularly important to keep in mind while thinking about free cash flow. Because the higher cash flow must be used to make interest payments, the debtor has fewer alternatives to choose from when considering what to do with the more cash flow than they would otherwise have had because of the need for the additional cash flow to be used to pay for interest.

The agency costs theory and the trade-off theory result in equivalent future findings. According to the trade-off argument, increasing a business's leverage has a favourable impact on corporate performance in the form of a tax shelter. This influence may be seen as an advantage for the corporation.

Their findings corroborate the agency costs theory, which claims that growing influence lowers agency costs of equity and enhances company value by pushing managers to behave more in the interests of shareholders, and this hypothesis is congruent with the agency costs theory. According to the agency costs hypothesis, increasing leverage lowers equity agency costs and increases company value by pushing managers to behave more in the interests of shareholders. According to Margaritis (2010) which are comparable to those of Berger and Di Patti, increased leverage improves a company's efficiency, which leads to an increase in the performance of the business as a Wooldridge (2002). In addition, a lot of research has concluded that a rise in debt results in a decrease in free cash flow and, as a direct consequence, agency costs

Zhang(2008- 2009), Byrd (2010) and Khan (2012). Figure 2.3 shows an illustration of some of the effects of the capital structure on business performance.

Figure 2.2: An illustration of some of the effects of the capital structure on business performance
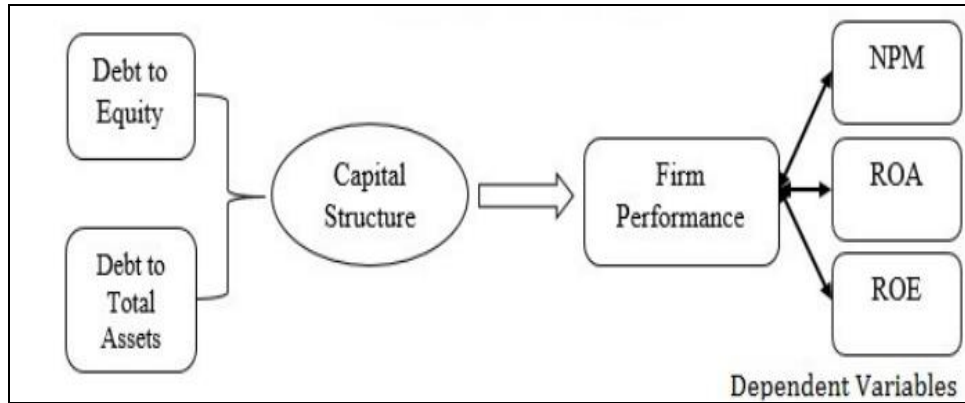
Source: Nasimi (2018)

2. METHODOLOGY

1.1 Objectives of the Research

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 Research

this 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 Research

2. Specifically, this study aims to determine the impact of capital structure modelling on the business performance of firms in 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
1	ÇİMENTAŞ İZMİR ÇİMENTO FABRİKASI T.A.Ş.	Cement
2	ÇİMSA ÇİMENTO SANAYİ VE TİCARET A.Ş.	Cement
3	GÖLTAŞ GÖLLER BÖLGESİ ÇİMENTO SANAYİ VE TİCARET A.Ş.	Cement
4	KONYA ÇİMENTO SANAYİİ A.Ş.	Cement
5	NUH ÇİMENTO SANAYİ A.Ş.	Cement
6	OYAK ÇİMENTO FABRİKALARI 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.

2.1 Method of the Research

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).

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

E stands for Equity.

ROE stands for Return on Equity.

EVA stands for Economic Value Added.

r_e is the rate of alternative cost of equity.

The concept often referred to as a single equation represents the Spread $(REO - r_e)$, 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*C* ....
(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):

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

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

Here, r_f 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. This strategy is prepared to take on business risks that are both internal and external, as well as financial risks that are both internal and external. If we cannot calculate the cost of equity using the CAPM approach, we will instead utilize this method. It isn't easy to compute the coefficient in this scenario because corporate shares are not being traded on the stock market. This condition develops when corporate shares are not being sold on the stock market. The build-up model is an empirical method that may evaluate the projected return on equity. This example demonstrates a common German approach to the valuation of stocks and shares. It makes an effort to consider as many different factors as it possibly can. As a consequence of this, the model is often referred to as the full Build-up mode Karakoc (2016).

The foundation of this technique is a thorough analysis of the individual's unique collection of risk factors. The idea that independent variables are the most critical aspects of a system is the fundamental tenet of the Build-up model, which serves as the foundation for its guiding principle. Valuing a company's shares requires analyzing the risks provided by these factors and considering those findings. There are many different Build-up models available, and the one that is selected will rely on the primary characteristics that are evaluated. Recent empirical experiments carried out by fame and French showed that the capital market is prepared to absorb two different risks. These hazards include the risk of smaller firms, which presents itself as a risk premium for lower stock liquidity in the market, and the risk that emerges from the fact that the company's market value does not surpass its book value. Both of these risks may be considered to be market risks. When using the Build-up model, the following considerations are applied to the problem of determining the appropriate interest rate:

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:

$$E(r_{i)} = r_f + Rp$$ .... (5)

Where E(r) stands for the cost of equity, rf 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:

$$RP = r_b + r_{fin}$$ .... (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	ÇİMENTAŞ İZMİR ÇİMENTO FABRİKASI T.A.Ş.	$EVA_{EquityCAPM}$	235,820	939,500	124,830
		Spread	-0.02	-0.08	-0.01
2	ÇİMSA ÇİMENTO SANAYİ VE TİCARET A.Ş.	$EVA_{EquityCAPM}$	-235,230	-905,519	-783,790
		Spread	-0.02	-0.08	-0.07
3	GÖLTAŞ GÖLLER BÖLGESİ ÇİMENTO SANAYİ VE TİCARET A.Ş	$EVA_{EquityCAPM}$	-687,220	-835,400	-461,100
		Spread	-0.06	-0.07	-0.04
4	KONYA ÇİMENTO SANAYİİ A.Ş.	$EVA_{EquityCAPM}$	-750,440	-200,940	-620,770
		Spread	-0.07	-0.01	-0.05
5	NUH ÇİMENTO SANAYİ A.Ş.	$EVA_{EquityCAPM}$	-504,450	-808,090	-880,550
		Spread	-0.04	-0.07	-0.08
6	OYAK ÇİMENTO FABRİKALARI A.Ş.	$EVA_{EquityCAPM}$	-120,770	-854,550	-489,360
		Spread	-0.01	-0.08	-0.04

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 leverage	Interest Coverage	E/FA	CL/TA
1	Çimentaş İzmir Çimento Fabrikası T.A.Ş.	2019	0.24	3.46	1.43	35387.97	2.62	0.22
		2020	0.15	5.56	1.3	69512.46	2.66	0.15
		2021	0.23	3.75	1.4	120.2	2.19	0.19
2	Çimsa Çimento Sanayi Ve Ticaret A.Ş.	2019	0.25	3.47	1.44	82.37	1.94	0.21
		2020	0.23	4.01	1.39	99313.19	2.5	0.21
		2021	0.25	3.47	1.44	14165.78	2.63	0.23
3	Göltaş Göller Bölgesi Çimento Sanayi Ve Ticaret A.Ş	2019	0.16	5.57	1.31	47290.27	2.67	0.16
		2020	0.24	3.76	1.41	113.01	2.2	0.2
		2021	0.19	5.13	1.32	143.5	2.33	0.16
4	Konya Çimento Sanayii A.Ş.	2019	0.24	3.76	1.41	113.01	2.2	0.2
		2020	0.19	5.13	1.32	143.5	2.33	0.16
		2021	0.16	5.62	1.31	876.42	2.49	0.14
5	Nuh Çimento Sanayi A.Ş.	2019	0.25	3.47	1.44	82.37	1.94	0.21
		2020	0.24	3.76	1.41	113.01	2.2	0.2
		2021	0.19	5.13	1.32	143.5	2.33	0.16
6	Oyak Çimento Fabrikaları A.Ş.	2019	0.16	5.57	1.31	47990.27	2.67	0.16
		2020	0.24	3.76	1.41	193.01	2.4	0.2
		2021	0.19	5.13	1.32	143.5	2.33	0.16

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 خطأ! لا يوجد نص من النمط المعين في المستند. **4:** Correlation matrix for Çimentaş İzmir Çimento Fabrikası T.A.Ş.

		TD/TA	E/TD	Monetary leverage	Cover. of Interest	E/FA	CL/TA	EVA/E
TD/TA		1.0000	-0.893	0.8966	-0.0240	-0.462	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	-0.764	1.0000	-0.2300	-0.453	0.9581	0.2225
	P=	0.000	0.000	---	0.961	0.307	0.001	0.632
Interest coverage		-0.0240	-0.122	-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	-0.933	0.9845	0.1688	-0.210	1.0000	0.2128
	P=	0.001	0.000	0.001	0.717	0.650	---	0.647
EVA/E		0.1522	-0.265	0.2225	0.1551	-0.117	0.2128	1.0000
	P=	0.615	0.566	0.632	0.140	0.801	0.647	=---

As can be seen in the matrix (Table **4**.4), the relationship between current liabilities and total assets is strongly directly proportional to linear. Financial leverage and total debt to total assets ratio are highly correlated and inversely proportional. Similar to this, equity and debt have a substantial if indirect, proportionate relationship.

Table خطأ! لا يوجد نص من النمط المعين في المستند. **6:** Correlation matrix for Göltaş Göller Bölgesi Çimento Sanayi ve T.A.Ş.

		TD/TA	E/TD	Monetary leverage	Coverage of Interest	E/FA	CL/TA	EVA/E
TD/TA		1.0000	-0.893	0.8966	-0.0240	-0.462	0.8456	0.1522
	P=	---	0.000	0.000	0.985	0.406	0.002	0.655
E/TD		-0.893	1.0000	-0.9954	-0.1220	0.4564	-0.654	-0.265
	P=	0.000	---	0.000	0.979	0.303	0.000	0.566
Financial leverage		0.8966	-0.995	1.0000	-0.2300	-0.453	0.9581	0.2225
	P=	0.000	0.000	---	0.961	0.307	0.001	0.632
Interest coverage		-0.024	-0.122	-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		-0.462	0.4564	-0.4535	0.5659	1.0000	-0.210	-0.117
	P=	0.306	0.303	0.307	0.185	---	0.650	0.801
CL/TA		0.8456	-0.875	0.8645	0.1688	-0.210	1.0000	0.2128
	P=	0.001	0.000	0.001	0.717	0.650	---	0.647
EVA/E		0.1522	-0.265	0.2225	0.1551	-0.117	0.2128	1.0000

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P=	0.615	0.566	0.632	0.140	0.801	0.647	=---

As seen in the matrix (Table **4**.6), the relationship between current commitments and total assets is substantially directly proportional to linear. The debt-to-asset ratio and financial leverage have a substantial and inverse relationship. Likewise, equity and debt have a considerable, albeit indirect, proportionate relationship.

Table 4.7: Correlation matrix for Konya Çimento Sanayii A.Ş.

		TD/TA	E/TD	Monetary leverage	Cov. of Interest	E/FA	CL/TA	EVA/E
TD/TA		1.0000	-0.8645	0.8794	-0.0170	-0.4610	0.7687	0.2442
	P=	---	0.000	0.000	0.985	0.406	0.002	0.655
E/TD		-0.8645	1.0000	-0.9865	-0.1220	0.4564	-0.7738	-0.2651
	P=	0.000	---	0.000	0.979	0.303	0.000	0.566
Financial leverage		0.8794	-0.9865	1.0000	-0.2300	-0.4535	08745	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	0.1571
	P=	0.975	0.979	0.961	---	0.185	0.717	0.840
E/FA		-0.4641	0.4564	-0.4535	0.5659	1.0000	-0.2105	-0.1279
	P=	0.306	0.303	0.307	0.185	---	0.650	0.933
CL/TA		-0.9532	-0.9635	0.8632	0.1688	-0.2105	1.0000	0.3323
	P=	0.001	0.000	0.001	0.717	0.650	---	0.757
EVA/E		0.2442	-0.2651	0.2225	0.1551	-0.1170	0.2128	1.0000
	P=	0.599	0.444	0.731	0.210	0.921	0.647	=---

According to the matrix (Table **4**.7), The Equity to Debt Ratio and Total Assets-Total Debt has a substantial negative connection.as well as a significant the percentage of total assets , total debt, and financial leverage.

Table 8: خطأ! لا يوجد نص من النمط المعين في المستند. Correlation matrix for Nuh Çimento Sanayi A.Ş.

		TD/TA	E/TD	Monetary leverage	Coverage of Interest	E/FA	CL/TA	EVA/E
TD/TA		1.0000	-0.893	0.8966	-0.0240	-0.462	0.8456	0.1522
	P=	---	0.000	0.000	0.985	0.406	0.002	0.444
E/TD		-0.893	1.0000	-0.9954	-0.1220	0.4564	-0.963	-0.265
	P=	0.000	---	0.000	0.979	0.303	0.000	0.566
Financial leverage		0.8966	-0.995	1.0000	-0.2300	-0.453	0.9581	0.2225
	P=	0.000	0.000	---	0.961	0.307	0.001	0.632
Interest coverage		-0.024	-0.122	-0.0230	1.0000	0.5659	0.1688	0.1551
	P=	0.975	0.979	0.961	---	0.185	0.717	0.699

E/FA		-0.462	0.4564	-0.4535	0.5659	1.0000	-0.210	-0.192
	P=	0.306	0.303	0.307	0.185	---	0.650	0.788
CL/TA		0.8456	-0.963	0.9589	0.1688	-0.210	1.0000	0.3001
	P=	0.001	0.000	0.001	0.717	0.630	---	0.595
EVA/E		0.2011	-0.222	0.1998	0.1498	-0.127	0.2128	1.0000
	P=	0.715	0.461	0.531	0.161	0.791	0.589	=---

The connection between current obligations and total assets is strongly directly proportional to linear, as seen in the matrix (Table **4**.8). Financial leverage and the debt-to-asset ratio are significantly associated and negatively proportional. Similarly, equity and debt have a significant, if indirect, proportional link.

Table خطأ! لا يوجد نص من النمط المعين في المستند. **5:** Correlation matrix for Oyak Çimento Fabrikaları A.Ş.

		TD/TA	E/TD	Moneta ry leverage	Covera ge of Interest	E/FA	CL/TA	EVA/E
TD/TA		1.0000	-0.998	0.8899	-0.0270	-0.661	0.8187	0.2142
	P=	---	0.000	0.000	0.985	0.406	0.002	0.655
E/TD		-0.998	1.0000	-0.9874	-0.1220	0.4564	-0.963	-0.265
	P=	0.000	---	0.000	0.979	0.303	0.000	0.566
Financial leverage		0.8399	-0.987	1.0000	-0.2300	-0.453	0.9581	0.2225
	P=	0.000	0.000	---	0.961	0.307	0.001	0.632
Interest coverage		-0.027	-0.122	-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		-0.664	0.4564	-0.4535	0.5659	1.0000	-0.210	-0.117
	P=	0.306	0.303	0.307	0.185	---	0.650	0.801
CL/TA		-0.818	-0.996	0.9754	0.1688	-0.210	1.0000	0.2128
	P=	0.001	0.000	0.001	0.717	0.650	---	0.647
EVA/E		0.2142	-0.254	0.2775	0.1551	-0.117	0.2128	1.0000
	P=	0.615	0.566	0.632	0.140	0.801	0.647	=---

The connection between current obligations and total assets, as shown in the matrix (Table **4**.9), is largely directly proportional to linear. The ratio of debt to assets and financial leverage have a significant and inverse relationship.

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.

We looked at several other factors, but we could not uncover any significant association between interest coverage and any of those other factors. Interest coverage does not form a pair with any of the other indicators because of the critical methodological discrepancies between it and the other measures that were looked at. Consequently, interest coverage is not a measure. The extent of interest coverage is a significant performance metric; nevertheless, it does not correlate with any of the indicators that are included in the category that has been chosen. There is not the tiniest bit of a link between any of the hands of the capital structure and the indicator of Spread. There is not even the smallest amount. Based on the information that has been provided up to this point, one may conclude that there is no meaningful link between the various ratios of debt and performance.

3. RESULTS

The following questions are mainly the research questions of this study.

- Does the capital structure of a firm impact its performance?
- What is the performance of a corporation at various equity-to-debt ratios?
- How does the composition of the capital structure influence the cost of equity and the performance of the company? How does the financial system function?
- Does the structure have a significant role in the determination of the cost of equity when utilizing the Capital Assets Pricing Model (CAPM) and the Build-up model respectively?

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 organisation's profitability, one of the most critical factors in achieving success. It is important to note that these principles hurt the organisation's profitability.

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 (SPSS). To do this, we looked at the relationship between the two (Tables 4.4 to 4.9). The correlations whose associated P values had significance levels more significant than the significance threshold of 0.05 were highlighted in the correlation matrix. This was done so that the reader may quickly identify these correlations. This was done to make it easier and quicker for the reader to identify the connections between the ideas presented. While finding the value of the correlation

coefficient, we used the scale that is defined in Cohen (1998) which takes into account the absolute magnitude of the correlation. This allowed us to determine the value of the correlation coefficient accurately.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. Therefore, it can be concluded that the result is that Turkish companies in this period had a weak correlation coefficient in terms of productivity and location. In the future, the development of a new measure will show us more accurate results

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نمذجة وتقييم هيكل رأس المال وتأثيره على أداء الأعمال الإنتاجية

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مستخلص البحث:

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 للأسمنت. ثم تم استخدام تحليل البيانات التي تم جمعها لتحقيق الهدف. تم في الجزء الأول من البحث 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 البحث 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 بكلا الخيارين. ستكون نتائج هذا البحث 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.