THE MINISTRY OF EDUCATION OF THE REPUBLIC OF AZERBAIJAN

AZERBAIJAN STATE UNIVERSITY OF ECONOMICS

UNEC BUSINESS SCHOOL

MASTER DISSERTATION

on the topic

"EFFECT OF CAPITAL STRUCTURE AND STOCK RETURNS IN THE PETROCHEMICAL INDUSTRY"

Mammadov Eldar Huseyn

BAKU - 2022

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SUMMARY

The relevance of dissertation: The modern world economy is constantly developing and changing.. Just as the capital structure is the basis of the financial world, changes in stock prices in the globalizing market economy are in the interests of both consumers and producers

The purpose of dissertation: Research the capital structure of selected petrochemical companies. Research the stock returns of selected petrochemical companies. Research of the effect of capital structure on stock returns in selected petrochemical companies.

Business research methods used in the dissertation: Correlation and regression were used in the analysis model. The analysis was performed using spss and python computer programs

The database of dissertation: The source of da for this study is “Yahoo! Finance ”and“ Morningstar ”platforms. The main database of the study is the data of 40 petrochemical companies in 2016-2021 from around the world

Limitations of the dissertation: Limitations of the study include the subject's database, limited and inaccessible economic and statistical indicators.

Practical results of the dissertation work: The results suggest that future studies should use more explanatory variables. It should examine its impact on macroeconomic variables such as stock returns, market returns, taxes and inflation, GDP growth and monetary policy.

Organizations, enterprises and businesses where the results can be used: The results research work can be used in in the activities of the authority subjects of comapanies, as well as in the management practice of economic entities

The structure and scope of the dissertation: the content of the dissertation consists of introduction, 3 chapters, 23 paragraph, 60 pages, a conclusion and list of literature.

Key words: Petrochemical, Stock Returns, Capital Structure , Risks

ABBREVIATIONS

CAPM	Capital Asset Pricing Model
EPS	Earnings Per Share
GDP	Gross Domestic Product
ROA	Return of assets
ROI	Return of investments
ROE	Return of equity
SPSS	Statistical Package for the Social Sciences

CONTENTS

INTRODUCTION

The relevance of of dissertation. The modern world economy is constantly developing and changing. The petrochemical sector, which is an inseparable and key part of the constantly renewed and developing energy sector, also keeps up with these changes. Just as the capital structure is the basis of the financial world, changes in stock prices in the globalizing market economy are in the interests of both consumers and producers. Due to the globalization of world trade, the liberalization of exchange rates, the volatility of interest rates, and the rapid changes in prices of various commodities, especially oil and petroleum products, due to increasing technological developments, companies, both producers and consumers, which are directly or indirectly involved in these products, are adversely affected . The company capital structure consists of the sum of their liabilitie and capital. How the liabilities and equity size will be determined within this amount constitutes the capital structure. An incorrect capital balance can lead to the liquidation and even bankruptcy of companies. Knowing the factors that make up the capital structure and the factors that affect the decisions about the capital structure will help to establish a solid financial structure. The main issue that concerns the shareholders or shareholders of the company is the profitability of the company. In companies with both public and private shareholders, the main goal of management is to create an optimal capital structure and bring more to shareholders at a lower cost of capital. Since the theory put forward by Modigliani and Miller in 1958, many researchers have carried out many studies on the capital structure of enterprises. The characteristics of the businesses may differ from each other, as well as the issues that they will pay attention to in the decisions they will take. In addition, the state of the country's economy, the sector in which the enterprise operates, the qualifications of the enterprise and the attitudes of business managers towards risk may differ. However, general criteria can be determined while creating the capital structure of the enterprise. One of the most important factors for businesses to survive and survive in crisis environments is the resource structure of businesses.

In this context, one of the issues that has attracted attention recently is the concepts of capital structure and cost. Capital structure is one of the most discussed issues in the field of finance, especially for the last 30 years. The capital structure decisions taken by the business managers are important in terms of the sustainability of the business and the fulfillment of the investments it needs. The aim of this study is to try to determine to what extent the stocks are affected by the specific factors when making decisions about the capital structure of petrochemical sector enterprises operating in the world and traded in the Stock Exchange.

Object and subject of research. Research the capital structure of selected petrochemical companies. Research the stock returns of selected petrochemical companies. Research of the effect of capital structure on stock returns in selected petrochemical companies.

Research methods. Correlation and regression were used in the analysis model. Regression model used annual financial data of companies to test the relationships between capital structure and stock returns.The analysis was performed using spss and python computer programs

Research database. The main information source for this study is “Yahoo! Finance” and “Morningstar ”platforms. The main database of the study is the data of 40 petrochemical companies in 2016-2021, which differ in terms of trade volume and are located on different continents and countries around the world.

Research limitations. Limitations of the study include the subject's database, limited and inaccessible economic and statistical indicators.

Scientific and practical significance of the results. The results suggest that future studies should use more explanatory variables. It should examine its impact on macroeconomic variables such as stock returns, market returns, taxes and inflation, GDP growth and monetary policy

CHAPTER I. CAPITAL STRUCTURE

1.1 Capital Structure Concept

The capital structure consists of debt and equity that a business uses to acquire its assets.The financial structure of companies consist of short-term , long-term debt, and equity, which are on the source side of the balance sheet. The distinction between a capital structure and a financial structure is that the financial structure includes short-term debts and provisions, but the capital structure does not. In other words, the financial structure displays the company's resource side and reveals how the company is financed and the financing composition, whereas the capital structure expresses the composition that provides long-term financing resources.[1]

Business capital structures describe the decisions that a company will make on how to acquire assets and build the best mix of long-term debt and equity in the capital structure.When establishing their capital structure, businesses are faced with a decision about how much to invest in long-term debt and equity items. The most significant consideration for the business when making this decision is to achieve an optimal capital composition while constructing the capital structure.[2]

There are two ways a business uses to finance its assets. These are liability and equity.Liability resources are provided from outside of business . Equity can come from the business partners and funds generated by the company, or it can come from the outside in the form of capital increases or new partners.[3] It is a loan that it has to repay when it is due. Capital, on the other hand, refers to the partnership shares that the foundation's stockholders have placed at the company's disposal.

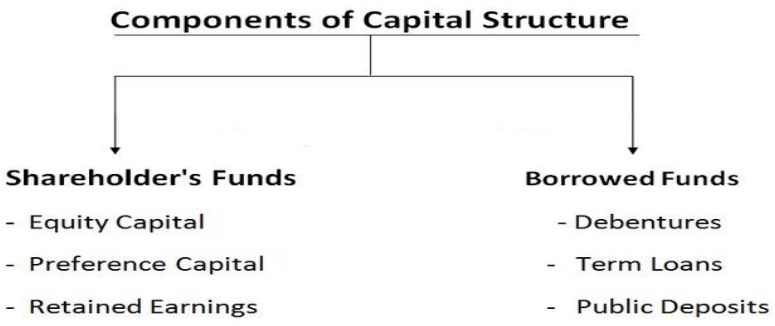
The debt that the business uses to finance its assets has two advantages. The first is that interest taken from the tax base lowers the debt's real cost. Second, those who finance the business provide a fixed income. As a result, the increased profits

[1] R.Metin Türko, Finansal Yönetim, Alfa Yayınevi, İstanbul 2002, 489.
[2] Muharrem Özdemir, Finansal Yönetim, Türkmen Kitabevi, Sakarya 1997, 305
[3] Öztin Akgüç, Finansal Yönetim, Muhasebe Enstitüsü Yayın No:63, İstanbul 1994, 483.

of the business when the business is profitable are not shared with the financers. In addition, financiers they do not have the right to govern. On the other hand, debt financing of company has 2 disadvantages.

The first of these is the increase in the debt of the business; hence the indebtedness ratio within the total resources, increases the risk of the business and the interest burden of the company increases. Secondly, when the business encounters bad days and the profits of the business are insufficient to pay the interest, it can lead to a process that can lead to the bankruptcy of the business. While financing the business with debt can deliver high returns to shareholders on good days, on bad days it can bring heavy bills to the business. Due to interest rates, businesses have suffered greatly and many businesses have faced bankruptcy.[4]

Figure 1. Capital Structure



Source: (https://www.capitalbudgetingtechniques.com/capital-structure/)

Businesses basically aim to maximize their market value and profits. The sector in which the business continues its activities can be effective in determining the capital structure. Businesses doing business in sectors where R&D activities are important and fixed capital investment must be high, have equity in their capital structure should give more weight. The excess of fixed expenses makes the operating profit (EBIT) of the business more sensitive to changes in sales. Since financing expenses are deducted from EBIT, EBIT becomes more sensitive to change in sales (operating leverage), it may be difficult to pay the interest on the debts on time. Therefore, businesses with high fixed expenses, that is, high business risk, give weight to equity

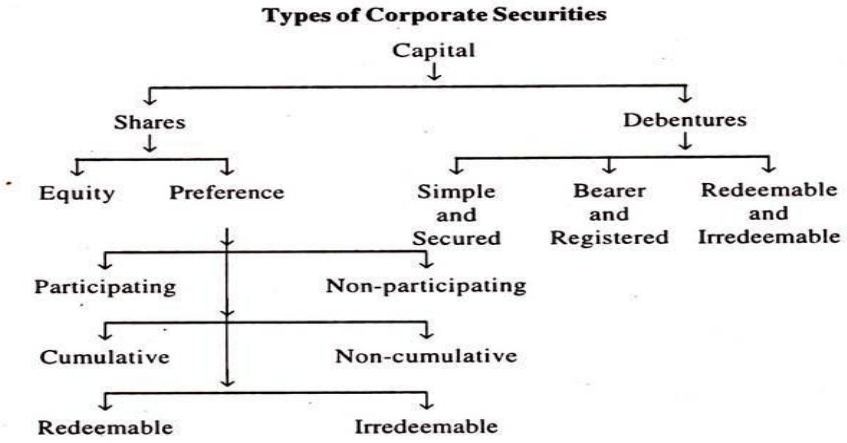
[4] Serpil Canbaş, Gamze Vural, Finansal Yönetim Açıklamalı Örnekler ve Problemler, Karahan Kitabevi, Adana 2010, 270

rather than debt in their capital structures. On the other hand, businesses that do business by focusing on working capital investments rather than fixed capital investments may focus on debt rather than equity in their capital structures. It should also be noted that borrowing also depends on the credibility and borrowing ability of the business.[5]

1.2 Differences Between Debt And Equity

The funds allocated by the shareholders of the business, as long as the business continues to exist, represent equity. The business does not have to pay back equity to shareholders throughout its life. In this respect, the equity-maturity relationship is not in the form of obligatory and definite payment as in other resources. Liability has time. Liability is repaid on the date stated in the contract. We can divide liability into three parts according to their duration: short-term, medium-term, and long-term. If liability is not paid in due time, the person or organization providing the financing may request the liquidation of business.The table below is more clearly stated.

Figure 2. Corporate Securities



Source: (https://www.businessmanagementideas.com/essays/capital-structure-essays/essay-on-capital-structure-of-a-company-company-management/11856)

Those who provide liability to a company have a preference right over the income of the company as compared to the owner or shareholders of the company.

[5] Nurhan Aydın, Mehmet Başar, Metin Coşkun, Finansal Yönetim, Detay Yayıncılık, Ankara 2011, 171.

If some shareholders of company are given priority in receiving dividends after all obligations are met against persons and institutions providing resources to the company, a share of the profit is given to the other shareholders after the dividend is distributed to the preferred shareholders. If the business has accepted to pay interest for resources it has received, it has to pay the interest whether the business makes a profit or not. Otherwise, it becomes liable before the law. Therefore, interest payments are fixed payments. On the other hand, whether or not dividends are paid to shareholders, or if so, how they will be paid is determined by the decision of the board of directors of the company. If the amount of demand of those who provide financing to the business is certain and limited and the principal and interest payments are not paid in due time.That the company makes a loss or the board of directors decide to don't distribute dividends with shaheholders even though the company makes a profit, it is not possible for shareholders to receive dividends by taking legal action[6].

1.2.1 Rights On The Assets Of The Business

Creditor and shareholder do not want money given to the business to be repaid by liquidation. If it becomes difficult for the business to carry out its activities, then they apply for liquidation. That is, the assets of the business are converted into money. In the event of liquidation of the company, the lenders have priority over the assets of the company, over the owners and shareholders of the company. After all debts of the business are paid, the remainder is divided among the shareholders of the business. The shareholders are paid first to the preferred stockholders, and then to the common stockholders, if any remain. The payment to shareholders is only in the amount of the shares. On the other hand, lenders can demand both the loan amount and unpaid interest. If the company has shown some of its assets as collateral when borrowing, the lender or institutions have the right to convert the collateral

[6] Arthur J. Keown, John D. Martin, J. William Petty, David F. Scott, Jr, Financial Manageament Principles and Appilications, Prentice Hall, New Jersey 2002, 469-471

into money in case of failure to fulfill its obligations. The business owner and shareholders do not have a guarantee against the capital they have given to the business. In principle, the owner and shareholders who have provided equity to the company have the right to manage the company. However, lenders have the opportunity to interfere with the management of the business up to a point and to restrict some of the management's work, with the conditions to be included in the debt agreements. Shareholders who hold preferred stock often do not take a management role. Preferred stock holders may retain control during periods when business operations go badly. This control occurs in the form of participation in the election of the board of directors of the company.[7]

Ordinary stock holders represent the most important group that has a say in business management. The general management of the company consists of ordinary shareholders, and they elect the board of directors. The general assembly formed by ordinary shareholders oversees the activities of the board of directors. Because common stockholders are the last to have rights to the assets and profits of the business, their risk is higher than that of preferred stockholders and business lenders. In the event of liquidation of the business, the cash will be paid first to the creditors, then to the preferred stockholders, and finally to the common stockholders.

1.3 Cost Of Capital

Since the most important aim of a company is to maximize the market value of the company, one of the most important factors in the realization of this aim is the cost of the resources they use in the financing of the assets.[8]

The factors that make the calculation of the cost of capital important are:

1. In order to reduce the cost of production, it is necessary to reduce the costs of the factors of production. In today's world, the most important factor for the company to compete with its competitors is to reduce the cost of production.

[7] Güven Sayılgan, Soru ve Yanıtlarıyla İşletme Finansı, Ankara Turhan Kitabevi, 2008, 255.
[8] Fong Chun Cheong, Equity Financing and Debt Financing, Relevant to PBE Paper II –Management Accounting and Finance, pp. 4

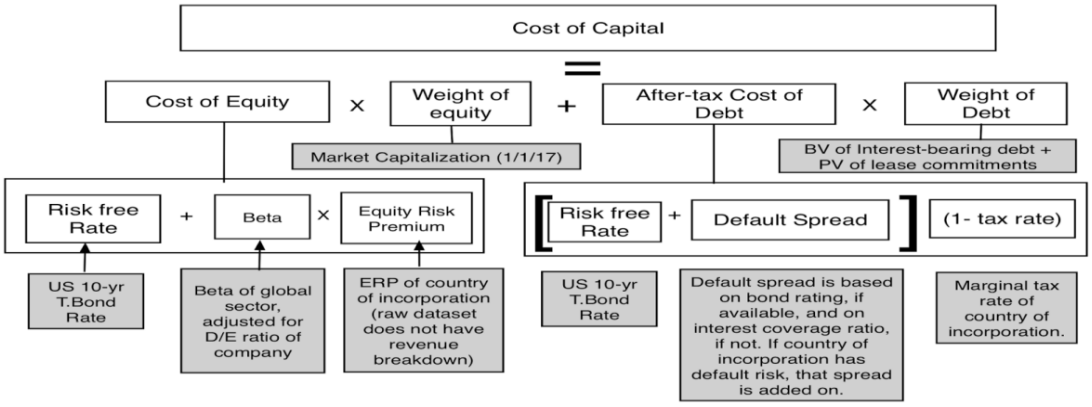
2. One of the criteria used in project analysis is the cost of capital.

3. The cost of capital is important in determining the value of the business..

4. Cost of capital is needed to determine the optimal capital structure.

An investor who provides funds to a business requests that an appropriate profit from the business be paid to him in return for these funds. The gain that the business pays to the investor due to the use of the funds is the cost of capital for the business. In other words, the cost of capital is the price a business has to pay for the capital it needs to finance its investments. For investors, the cost of capital is considered the "rate of return" requested by investors who will buy the partnership notes of a business. The cost of liability and equity resources used in financing the assets of a business greatly affects the success and profitability of the business. The most important point that the business should pay attention to at the establishment stage or in the following periods is that the business cannot continue its activities by constantly borrowing without sufficient equity capital. As a result of the changes in the resources they use during their activities, the businesses act in the direction of increasing the profitability of the business by reducing the share of the capital with high cost. In the table below, there is a clear explanation of the cost of capital.[9]

Figure 3. Cost of Capital



Source: (https://theintactone.com/2018/04/25/fm-u2-topic-2-cost-of-capital-ebit-eps-analysis-capital-gearing-debt-equity-ratio-generation-of-internal-funds/)

[9] Eugene F.Brigham, Michael C.Ehrhardt, Financial Managemenet 13th ed., South-Western College Pub, 2010, pp. 336.

The correct determination of the cost of capital is important both for the country's economy and for business. While the under-determined capital cost disrupts the optimality in the resource structure, it creates bad results for the country's economy, while the over-determined capital cost causes the rejection of investment projects and slows the growth of the national economy. Anyone has to decide what the appropriate level of borrowing should be for a business' equity capital base. To help make this decision, it is helpful to know the appropriate level of borrowing if it is theoretically possible to increase shareholder wealth by changing the debt-equity ratio.The cost of firms debt is less than the cost of their equity. Because borrowing carries less risk for investors. Considering the relationship between risk and return, investors demand more returns when they take more risk, and they are willing to accept less returns when they take less risk. Interest payment of the loan is tax free.[10] In many cases, debt financing may be preferable if lower costs and tax deductions are considered together. But when we also consider the impact of risk and the return demanded by shareholders, the level of debt increases the cost of capital. The terms borrowing and leverage are both used to refer to the level of debt in the company's capital structure. It is thought that companies with lower leverage give less weight to debt in their capital structures, while businesses with higher leverage give more weight to debt in their capital structures. The beta of equity of borrowing firms is higher than that of non-borrowing firms. Because shareholders exposed to more risk will demand more returns. Controversies over capital structure occur in part between the greater returns demanded by shareholders and the gains companies make from lower-cost and tax-deductible debt.

1.3.1 Cost Of Capital Types

Businesses cannot consistently maintain the same capital structure. The debt/equity ratio of businesses varies over time. For example, a company cannot

[10] Lakshmi Shyam-Sunder, Stewart C. Myers, Testing static tradeoff against pecking order models of capital structure, Journal of Financial Economics, vol. 51, 1999, pp. 451.

finance its permanent businesses with liability. Even if the other resource is high in the capital structure at the establishment stage of the business, the undistributed profit, which will create the equity base, resorts to capital increases and those who manage the business have to create a balance between debt and equity. Changes in the capital structure affect the capital cost of the company. While determining the cost of resources used by the company, it is assumed that the profit distribution policy, resource composition and business risk are fixed. While the most important factors affecting the resource cost of a company are money and capital markets, the policies followed by the company also affect the resource cost.[11]

If the cost of resources is considered as a criterion when making an investment decision, the following should be considered.

1. Historical resource costs are not used in new investments.

2. When calculating the capital cost of profit-making businesses, in other words, tax-paying businesses, tax should be taken into account and the cost after tax should be calculated.

3. The use of fund resources while the business continues its activities not only changes the current debt/equity ratio, but also limits the resources to be used in the future.

1.3.2 Cost Of Stock Issue

The cost retained earning was less than the cost new issued share. The reason for this is that the business has to carry many costs due to the various formalities in the newly issued shares; the issuance of the prospectus, the printing and distribution of the new shares, and the commission paid to the institutions that act as intermediaries in the issuance transaction. Another factor that increases the cost of stocks is that the issue premiums of the stocks issued above their nominal value in our country are subject to income tax. Also, issuing and selling new stock will have

[11] Metin Kamil Ercan, Ünsal Ban, Değere Dayalı İşletme Finansı Finansal Yönetim, Gazi Kitabevi, Ankara 2005, 210.

a watering effect on stocks, which will lower the desired returns per share, resulting in a drop in stock prices.[12]

It provides the answer to the question of how much of the funds provided in this way should be directed to investments with the lowest percentage of profit in order for newly issued stocks to be considered a burden enough for the business to bear. In other words, it will be tried to answer the question of how much it will cost the company to issue new stocks.The cost to be calculated considering the costs of issuing new shares is as follows:

$$k_e = \frac{d_1}{P_0(1-f)} + g = \frac{d_1}{P_n} + g$$

Pn= The net cash amount provided to the business with the issuance of new shares is Pn=P0(1-f)

f=Percentage of issuance expenses

d1=Dividend distributed to shareholders

g=growth rate

Since f represents the percentage of new stock issuance expenses, Pn=P0(1-f) represents the net amount that one share provided to the business due to the capital increase.

1.3.3 Cost of Convertible Stocks

Another form of issuing equity that is deferred or deferred is the issuance of convertible bonds. In this way, businesses have the opportunity to do this by postponing it to a future date, instead of issuing stocks at first. The reason why the business does this is to finance it with equity. Because, the conversion of bonds into stocks, financing with liability will replace financing with equity. The cost of the fund obtained by issuing convertible bonds with stocks is the discount rate that equates the inflow of funds provided by the company by issuing convertible bonds to the sum of the net (after tax) interest to be paid until the replacement date and the market value of the partnership notes to be given in return for the bond at the

[12] Fred Weston, A Test of Cost of Capital Propositions, The Southern Economic Journal, vol. 30, No. 2, 1963, pp. 95.

exchange date.The cost of convertible bond can be calculated with the help of the following formula:

$$B_0 = \sum_{t=1}^{n} \frac{I(1-T)}{(1+k_e)^t} + \frac{P_n IR}{(1+k_e)^n}$$

B0 = The (nominal) value of the convertible bond at the date of issue

I = Annual interest payments based on coupon rate

T = corporate tax rate paid by the business

n = Duration of investment

Pn = expected market value of shares at the end of period n

ke = cost of convertible bond

IR = conversion rate of bonds into stocks

1.3.4 Cost of Preferred Stocks

A stock that has a distinction between a bond and a common stock is a preferred stock. We can express the similarity of preferred stocks as bonds, as they have the right to receive a share in the profits, they have a continuous payment obligation for the business, and they have the right to receive a share from the assets of the business as a result of the liquidation or bankruptcy of the business. Although the decision on the profit distribution by the general assembly of the company in joint stock companies does not constitute an obligation for the business, companies that issue preferred stocks in real life generally distribute dividends. From this point of view, preferred stocks, like bonds, become a financial asset that requires constant payment. While bonds are in the top priority for businesses in bankruptcy, liquidation or any other payment, preference stocks follow the bond in priority. The side of preference shares that are similar to common stocks is that they have a right to take a partnership in the business, that is, the assets of the business, and as a result, they have the right to vote in the general assembly of the business.[13]

[13] Anila Cekrezi, A literature review of the trade−off theory of capital structure, 2013, pp. 128.

Although there is no legal obligation to distribute dividends to preferred stockholders, dividends are generally made on a continuous basis.

We can formulate the cost of capital that businesses acquire by issuing preferred stock as follows:

$$i_m = \frac{D_p}{P_0}$$

Dp : Dividend provided to the preferred stock owner

Po : Market price of preferred stock

This cost is the after-tax cost for the business as it is paid from the profit amount remaining after the corporate tax is paid. That is, the dividend paid for the preferred stock is not deducted from the tax base as an expense and the tax factor is not taken into account in calculating the cost of the preferred stock.

1.3.5 Cost Of Retained Earnings

Undistributed profits have an important place in the financing of investments for businesses. Undistributed profits are one of the important sources for businesses. It can be thought that retained earnings have no cost. However, this thought is misleading. Because the profit share that the business shareholders cannot obtain due to the retained profit constitutes the opportunity cost and expresses the cost of the retained profits. For this reason, business management should manage the resources they obtain in the most efficient and profitable way, taking into account the opportunity costs. If the income to be obtained if the profit remains in the business, is more than the income that the shareholders expect to receive in different areas of use, the business may prefer not to distribute all or part of the profit to the shareholders and remain in the business. In such a case, the rate of profit to be obtained from the alternative areas of use, in case the profit is distributed by the shareholders, should be less or equal to the rate of profit they expect to obtain from the investments to be made if the profit is not distributed.[14]

[14] Sanford Grossman, On the Efficiency of Competetive Stock Markets Where Trades Have Diverse Information, The Journal of Finance, vol. 31, No. 2, 1976, pp. 580.

1.4 CAPM (Financial Asset Pricing Model)

One of the methods used to calculate the cost of equity is the Financial Assets Pricing Model. There was a direct relationship between the degree of risk of an investment and the expected return. The coefficient β is used as a measure of undistributed risk in the model. This coefficient expresses the level of change in the return of the security as a result of the change in the rate of return in the market. With the CAPM equation, the required earnings ratio for the stocks of a business is determined.

$$k_s = R_f + \beta_j(k_m - R_f)$$

ks = rate of return of the security

Rf=Risk-free rate of return

Bj=Unallocated risk index of the security

km=Market rate of return consists of two parts in the model.

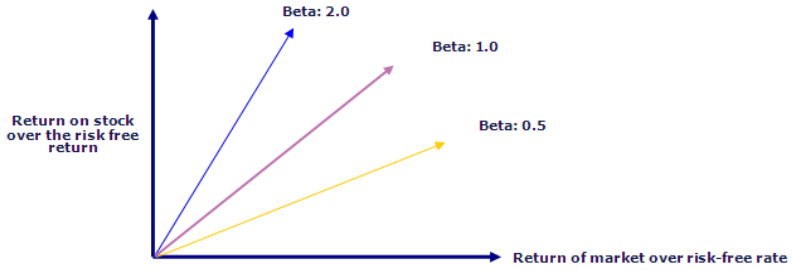
1-Risk-free rate of return Rf

2-Risk premium Bj(km- Rf)

(km- Rf) is the market risk premium.

Government bonds and treasury bills yield rates are expressed as the risk-free rate of return. It is used as the rate calculated for the business. However, it may not be possible to directly calculate the expected rate of return of the market. We can see the graphical effect of Beta, which measures stock risks related to the general market, on the CAPM. Identifying elements of risk: Risk management begins by identifying financial risks and their sources or causes. The best starting point for risk management is the company's balance sheet. It provides a snapshot of the debt, liquidity, currency risk, interest rate risk, and commodity price vulnerability the company faces. In fact, income and profit cannot be separated from risk.

Figure 4. Financial Asset Pricing Model



Source : https://www.wallstreetmojo.com/capm-beta-definition-formula-calculate-beta-in-excel/

Three factors must be taken into account in calculating this return.

1- Expected inflation rate,

2-The real growth rate of the economy,

3- Risk premium of stocks

1.4.1 Cost of Equity

In order for the market value of the company to remain the same, the lowest rate of profitability required by the investment projects provided by the equity capital of the company is accepted as the cost of equity. Investment projects that will yield a profit below the cost of equity capital decrease the market value of the company, while investment projects that provide a profit above the cost of equity increase the market value of the company. For example, if the equity capital of the company is 30%; if the internal rate of return of the investment financed by equity is 30%, the market value of the company remains the same. However, if the internal profitability rate of the investment is 40%, the market value of the company increases; if the internal profitability ratio is 20%, the market value of the company decreases.[15]

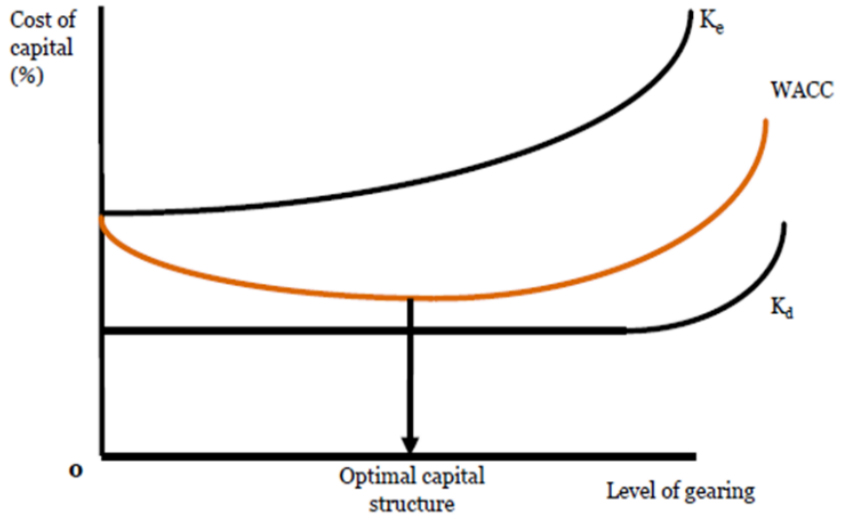
[15] Noryati Ahmad, Does Age of the Firm Determine Capital Structure Decision? Evidence from Malaysian Trading and Service Sector, International Business Management, 2015, vol. 9, No. 3, pp. 202

1.4.2 Optimal Capital Structure

It is very important for the business to determine the amount of capital items. How will the business create the optimal capital structure by borrowing at what rate and using equity at what rate?

In order to create the lowest cost capital structure, that is, the optimal capital structure, within the framework of the target capital structure, firstly, the low debt capital is started and the corresponding equity capital is found with a simple ratio. This system is maintained for debt capital and equity, and the lowest cost capital structure is tried to be created. In the graph below we can see the optimal capital structure reflection

Figure 5. Optimal Capital Structure



Source : https://pecconsultinggroup.com/the-optimal-capital-structure-for-financing-an-industrial-project/

The debt and equity used by the business in financing their assets while performing their activities is called the capital structure. If businesses perform their activities by balancing return and risk while creating a debt and equity structure, the cost of capital decreases and market value increases. Businesses create the target capital structure by taking into account many factors. This target may change over time according to changing conditions. If the business has a borrowing rate below

the target capital structure, than a higher rate of borrowing will be needed to meet the capital needs. If the debt ratio of the company is above the target, then the company will provide the financing it needs by issuing stocks. The use of high debt in the formation of the capital structure of the company both increases the desired rate of return on equity capital and increases the risk of operating earnings. It is stated that four basic elements affect capital structure decisions in businesses.[16]

1. The risk level of the business
2. Tax status of the business
3. Financial flexibility
4. Aggressive or conservative nature of the business

When discussing the financial structure of businesses, the first question that business owners should answer is whether it is more appropriate for the business to use liability or equity. Business partners will of course, answer this question, and this answer is largely determined by the operating profit of the business.

When deciding on the optimal capital structure of the business, the finance manager may consider the capital structure in the relevant industry or the proportions of similar businesses. However, it cannot be said that this system will always reach the right result in terms of an optimal capital structure. Similar companies in the sector in which the companies operate may have acted carefully in financing, and they may not have used all of these opportunities, although they have much more opportunities to use liability. As a result, the ratios applicable to the relevant industry may differ from the ratios related to the capital structure of the company. While the ratios of the industry in which the business operates or of similar businesses are not always a good indicator regarding the optimal capital structure, it should be noted that if the capital structure of the company is different from the industry average or similar companies in both directions, it will cause suspicion in the credit market.

[16] Roberto E. Wessels, Sheridan Titman, The Determinants of Capital Stucture Choice, The Journal of Finance, 1988, vol. 43, No.1, pp. 6.

Businesses whose capital structure differs from the industry average should have arguments to rationally explain the reason for this to financial institutions. Differences in money and capital markets, changes in the general economy or industry, differences in the cost of debt and liabilities, changes in the characteristics of the business (such as growth, change in the attitude towards risk), changes in the tax field or the advice given by financial institutions can change the optimal capital structure. The optimal capital structure may be affected by this.

1.5 Stock Market

Equity is one of the most traded securities in the capital markets, and returns are of great importance in the process of creating a stock portfolio by investors. The return that investors expect to obtain from their stock investments consists of the sum of the dividend and the capital return that will emerge as a result of the positive price changes of the stock (Rodoplu, 2001: 436). Companies, stocks and market conditions need to be analyzed well in order to provide the targeted return from stock investment. Fundamental analysis can be a guide when choosing a portfolio for stock investment (Cengiz and Püskül, 2016: 295). The valuable documents given to shareholders by capital companies for the purpose of documenting their capital shares are called stocks. Stock represents the capital belonging to a business (Cengiz and Püskül, 2016: 295). Shares, which are also actively used in investments, are defined as securities issued in duplicate and in series, with the same phrases on it, and giving the owner the right of partnership. Shares give shareholders the right to receive dividends, to participate in management, to vote, to buy new shares, and to obtain information (Otyakmaz, 2017: 6).

Stock prices are shaped according to the laws of supply and demand. This century-old economic model of Alfred Marshall and Leon Walras is the most basic factor that creates stock prices.

Interest rates also affect the stock market, and therefore stock prices. To put it simply, in a high-interest economy, savers prefer to buy bonds and various funds from which they can earn interest, rather than buying stocks in the stock market. In

this case, stock prices fall. The increase in interest rates decreases the stock price for the reason I mentioned; on the contrary, when interest rates decrease, stock prices increase. For example, there is an inversely proportional relationship between share prices and interest rates. Official company statements and company news also affect stock prices. Imagine that you will buy stocks from a company; of course, developments related to the company will directly affect the share prices of the company. It is not possible for major developments regarding the company not to affect the stock.

So, do acquisitions always raise the stock price of companies? No way. For example, the company's shares crashed when Facebook (FB) bought the messaging app WhatsApp for $19 billion. The reason for this was that current investors interpreted the situation as Facebook has lost its young audience and is trying to close this gap with WhatsApp. Moreover, the huge amount that came out of Facebook's vault did not please stockholders. For this reason, the company's shares were heavily disposed of for a while after the news of the acquisition, and the share prices depreciated. Let me give an example from Turkey. There are some reports that Wal-Mart, one of the world's largest retail giants, will buy Turkish Migros (MGROS). Whenever this news comes out, Migros' share prices take flight.

What I will say is that official announcements about companies, developments about companies, news of acquisitions can either increase or decrease share prices. For this reason, you need to follow the news and developments of a company you are investing in. These developments are also used for fundamental analysis in the stock market. Let me first explain what these two concepts mean, as most investors who have just gotten a new understanding of the stock market confuse speculation and manipulation. Manipulation means making money in return by inflicting losses on other investors, who deliberately manipulate the market in their own interests to lower or raise stock prices. Manipulation is a crime and there is a penalty.[17]

[17] A research on stock price manipulation in China
S Zhanga, Y Yaob - Eur. J. Bus. Econ. Account, 2016

Speculation means to buy a stock that is predicted to rise in the future, or to sell a stock that will decrease in the future. Speculation is not a crime and speculation is allowed. This is the difference between them. Speculation is free, manipulation is prohibited. Trust always plays an important role in the stock market. While investors are more willing to buy stocks they trust, they are not willing to buy stocks they do not trust because they see it as risky.

For this reason, expectations formed by the trust or distrust of the investor are among the factors that determine stock prices. Domestic political events have an extremely important effect on the country's stock market. Political and political events in the country also affect the stock market. I can show problems such as political instability, decreased trust in the government, military interventions in the administration, corruption and deep polarization in the country's parliament as political and political events that can affect the stock market.[18]

Especially from Turkey; but let's not pass without looking at the world briefly. After the assassination of the thirty-fifth president of the USA, John F. Kennedy, on Friday, November 22, 1963, the stock market collapsed in the country and the markets sank. Again, two years ago, the Greek government's political maneuvering by pushing the Presidential elections forward caused the Athens Stock Exchange to experience the hardest daily decline of the last 20 years.

As for Turkey, the political tension between the President and Prime Minister of the period, which was among the causes of the 2001 crisis, caused the stock market to experience a historical decline of 15 percent at that time.

If I were to expand the history, when the period between 1987 and 2006 is examined, the military interventions in Turkey, the coalition governments that are incompatible with each other in the 1991-2002 period, the secular-anti-secular polarizations that occurred among the people after 1980, the political and political

[18]Jensen, M. (1986). Agency cost of free cash flow, corporate finance and takeovers. American Economic Review Papers and Proceedings, 76, 323-329.

instability periods that are frequently experienced in the country are revealed. The economic negativities it caused also affected the stock market badly.

Similar political and political instabilities affect the economies of the countries negatively, and the negatively affected economy, as I mentioned in the second title, negatively affects the stock market. On the contrary, positive effects may occur in a country where similar events do not occur and there is political stability. Scandals, which occupy a large place on the front pages of newspapers and news sites, are often important on the stock market. Frauds, problems that erupt within financial intermediaries, cheating, prison sentences, trials, lawsuits, almost any scandal can have an impact on stock prices.[19]

This scandal broke out in Hungary, which came to the for a few years ago when financial intermediaries cheated. After the scandal, the Hungarian stock market lost great value. Enron and Parmalat scandals, which are the most well-known ones, also brought great effects with them when they emerged. These were indeed big scandals. In terms of being the first in Europe, Parmalat had a great impact when it broke out with its illegal transactions. When we pulled the Enron scandal out of here, this scandal affected the stock market at that time. There is no such thing as only scandals in big companies that affect the stock market. If it turns out that one of the top executives of the company whose stock you hold is also involved in fraud, this is also a big scandal and will undoubtedly have a lowering effect on prices. It can affect stock prices on financial sites, news sites, newspapers, magazines, television, or social media.

The media does not only give place to big scandals, but also often gives place to some gossip under the name of 'sensation'. You may remember the example of Wal-Mart buying Migros that I mentioned a few points ago. Did he buy it, no. Was the news true, no. Did Migros shares rise after the news, yes. Even this example is enough for you to see how the media has a huge influence on stock prices. The news

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[19] B.Nazif. Sermaye Yapısı Ve Hisse Senedi Değeri Arasındaki İlişkinin Değişik Borsalarda Mukayeseli Olarak İncelenmesi: Yayımlanmamış Doktora Tezi, Gazi Üniversitesi Sosyal Bilimler Enstitüsü, Ankara, 2008, s.217

about companies, company executives or any situation that may affect the paper in your hand, can affect the prices even if it is not true, does not reflect the truth, or even if it is a rumor. International events and developments have a significant impact on developing country stock markets. Exchange rates, trade agreements and changing international relations can affect stock prices. Apart from these, there are some countries that have a direct impact on stock markets.Economic data announced in the USA can affect the prices of oil and precious metals, especially global stocks.

For example, if the Central Bank of the Republic of Turkey (CBRT) raises interest rates, we can witness the increase in the value of the Turkish lira against other currencies, as well as the decrease in prices in the stock market as a result. The CBRT's interest rate decisions affect the stock market, but this decision does not affect the global markets. But if the US Federal Reserve decides to raise or lower interest rates, the stock markets of many countries, including Turkey, will be affected by this move. Let's say the US Federal Reserve decided to raise interest rates; in this case, stocks in Turkey can be expected to decline. There are other countries that affect the world besides the USA. For example, developments in China, which is the most powerful economy in the world after the USA, can also affect world stock markets. Not only does the economic data of the world's strongest economies affect global and local markets. Political events in these countries and almost any major development that can cause investors to panic can also affect the stock markets. Administrative changes, elections, and social events can be given as examples. Although natural disasters in countries generally have a negative impact on the markets, if there is a natural disaster that will revive the economy, this can have a positive effect, albeit rarely. Major disasters, such as earthquakes, floods, and hurricanes, often do not bring good results. For example, after the earthquake on 17 August 1999 in our country, interest rates reached 115 percent, and there was a 10.3 percent decrease in the stock market.For this reason, natural disasters also have an effect on stock prices. Frequently, a state of war has a greater impact on markets

than acts of terrorism.However, terrorism and terrorist incidents also affect the stock markets.

Here are the laws of supply and demand; here are the price! The market, which we call the market, is the place where supply and demand are balanced; bargaining is made, and the price is determined. I can sum it up like this; If everyone wants to sell T-shirts (supply) prices go down, if there are too many buyers (demand) prices go up. This rule applies to anything you buy, whether for t-shirts or stocks. We, the buyers and sellers, determine the changing prices. While the price of a stock with a large number of buyers increases, the price of a stock with a large number of sellers decreases.Basically, the excess supply against the stock raises its price, while low demand causes the price to fall. Popularization of the stock increases the supply, but because the stocks are limited and the number of people who want to buy them is high, there is an increase in prices. The desire to dispose of the purchased stocks for various reasons also causes the value of those stocks to decrease. Another question comes to mind here. What influences supply and demand for stocks? We can divide this into two main groups as macro and micro-reasons. Considering the micro, factors such as the attractiveness of the industry, the management of the company, the working model, the increase or decrease in the company's turnover, the company's projects, future plans, successes, new business news, increase in competition, technology compatibility, increase in production affect stock prices. The positive or negative news and signals received about the company are among the factors that significantly trigger buyers' psychology and trading rates.

When we consider macro, factors such as the course of a country or world economy, an increase or decrease in interest rates in the country cause the economy to slow down or grow. This in turn affects company performance and people's demand for the stock. If we look in more detail, factors such as oil prices,

unemployment rates, high debt rates, population structure, growth rate, and the situation in global markets are also at macro level.[20]

The most important macro factor affecting stock prices is politics. Imagine a bathtub. You cannot increase the water in the tub without a stopper. This plug is just like politics and stability in politics. The better the stability in policy, the lower the interest rates and the markets begin to appreciate. Political problems and uncertainties may cause negative fluctuations. Sometimes speculative statements can also cause the stock to lose value. The spread of bad news about the market can lower the value of the stock, no matter how good the company is. Although the supply and demand issue determines its value in the long run, daily developments and signals in the markets also affect the situation. If you want to know how the price of a stock changes, you must first know how the buying and selling of stocks takes place. The stock buying and selling process is actually very simple.

1.5.1 Calculation Of The Real Value Of The Share

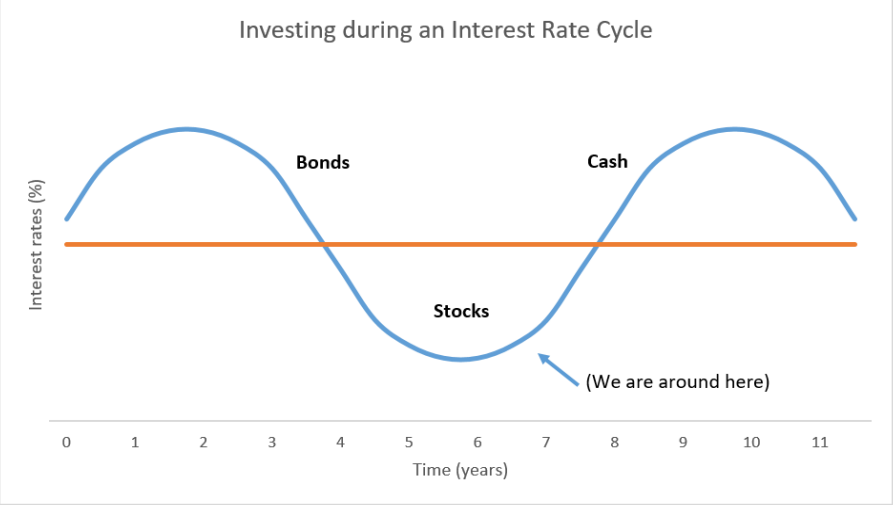
Stock valuation is carried out by the owner and partners of the business, the person giving credit to the business, institutions/organizations, the government and financial analysts for purposes such as financial management, public offering, portfolio management, privatization and mergers and acquisitions (Korkmaz and Ceylan, 2006: 248).

Basically, 3 methods are used in stock valuation. These are; technical analysis, efficient market theory, and fundamental analysis. Among these methods, technical analysis is the most used method, especially in markets where efficient markets are not valid. Technical analysis is the method that assumes that the past stock price movements will continue in the future, only through graphs. The efficient market theory, on the other hand, assumes that all kinds of information coming to the market are reflected in the stock returns. These; weak efficient market theory, semi-strong efficient market theory and strong market theory. Another method is fundamental

[20] B. Erhan, D. Murat. Finansal Analizde Kullanılan Oranlar ve Firma Değeri İlişkisi: İMKB'de Bir Uygulama// Muhasebe ve Finansman Dergisi, 2010, sayı.46, s. 74-83

analysis. In the basic analysis method, the real value of the stock is sought with stock valuation methods. Stock valuation methods are also divided into two as discounted cash flow methods and market-based valuation methods. You can see the relationship between share value and interest in the graphic below.

Figure 6. Interest Rate Cycle



Source: https://www6.royalbank.com/en/di/hubs/investing-academy/article/how-to-find-a-stocks-real-value/kp1bui8q

The most accurate and theoretically justified method in terms of determining the company's fair value is the discounted free cash flow model. It takes into account all future cash flows (operating, investment and financial) that will arise in the course of the company's activities. This is its advantage over the dividend discount model, which takes into account only future dividends, thereby assuming that they faithfully reflect the totality of generated cash flows. However, in practice, companies pay dividends based on a certain policy, which, as a rule, is not always tied to their ability to generate value. The residual income model, in turn, relies heavily on accounting figures that do not fully reflect monetary flows generated by the company.

The discounted free cash flow model represents the company as a cash flow processor. Cash flows into the company in the form of revenue from products sold, and leaves it in the form of its operating expenses (for example, for the purchase of raw materials, payment of salaries, taxes). The company uses part of the income for

short-term investments in operating capital and long-term investments in fixed assets and equipment. The remaining cash is available for payment to the company's investors: bondholders, creditors and shareholders. This part of the funds is called the free cash flow of the company because it is free to pay out to its shareholders.

A company's free cash flow is defined as the cash flow generated by the company's activities that is greater than the amount of capital investment required to maintain current production capabilities. Thus, it is the cash available to ordinary shareholders after financing the capital investment, debt and working capital investment requirements. However, their forecasting is associated with the need to take into account the specific risks associated with them. These risks are accounted for through a discount rate that brings expected future cash flows to the present, taking into account the time value of money and the risks associated with them:

$$[CF1 / (1+k)] + [CF2 / (1+k)2] + ... [TCF / (k-g)] / (1+k)n-1]$$

CF1: The expected cash flow in year one

CF2: The expected cash flow in year two

TCF: expected cash flow overall

k: The discount rate,

g: The expected growth rate

n: The number of years included in the model

One of the most difficult steps in using this model is determining the discount rate, which consists of the real risk-free rate, the inflation rate, and so-called risk premiums. There are four main types of models for estimating the equity risk premium: historical, leading (forecast), macroeconomic, and survey.

Despite the differences in approaches, a common point in determining the discount rate for cash flows is the need to take into account those specific risks that affect the specific cash flows of a particular company. However, it is necessary to distinguish between the fair value of a company and its current market value, which reflects market sentiment regarding the development of the country's economy in

general and a particular company in particular, as well as speculative tendencies. As a result, the market value may differ from the fair value, since stock market participants in the process of calculating the value of a company take into account not only objective factors and risks. but also subjective ones that are not specific to a particular industry and do not directly affect the ability of a particular companies generate cash flows.[21]

1.5.2 Technical Analysis

Technical analysis is a method that allows to predict future prices of stocks with the help of graphs of past price movements of stocks. Technical analysis is based on the logic of "history repeats itself".In addition, it should be noted that this logic is not correct for efficient markets. Therefore, it is seen that technical analysis completely contradicts the efficient market hypothesis (Aktaş, 2008: 38). Technical analysis involves predicting future price movements for a particular firm's stock and, for this, examining stock prices. First, an examination is made to identify recurring trends or patterns in past price movements. The new stock prices are similar to the past.

Technological analysis is based on the belief that these trends or patterns repeat themselves by matching emerging trends or patterns with their past. According to this understanding, it is possible to predict so-called future stock price movements by defining developing trends or patterns (Razuk, 2001: 15-16). It is possible to invest using technical analysis method by analyzing the information of stock prices in the past using some statistical and mathematical methods. Technical analysis is a type of analysis that tries to determine how the future direction of stock prices will be by using historical financial information. Technical analysis allows for determining when to buy and sell these shares. In technical analysis methods, where the human factor is also important, emotions and excitements in the face of a situation create a trend. How often this trend repeats is revealed with prepared

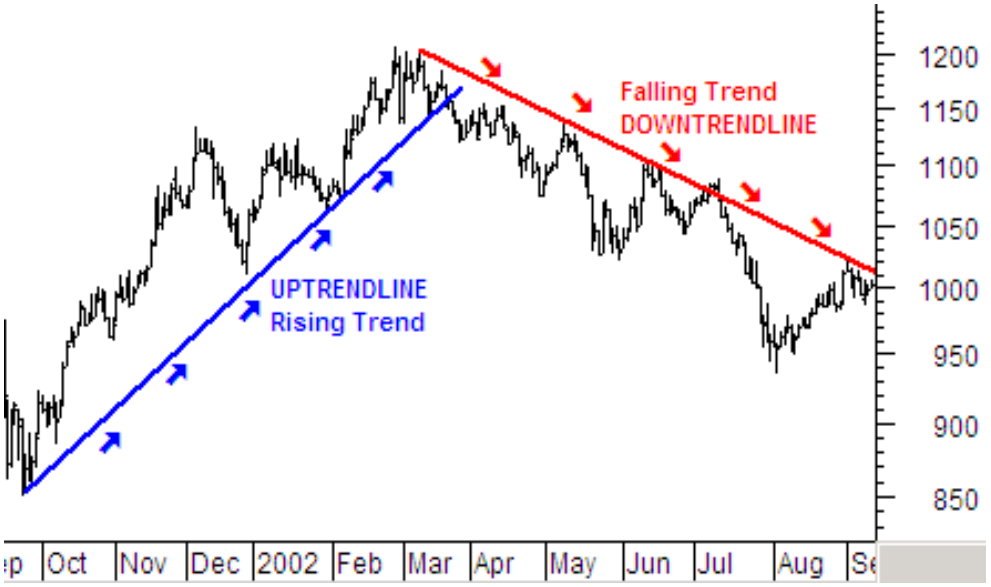
[21] Ö.Akgüç, Finansal Yönetim. 8 bs. İstanbul: Avcıol Basım Yayın, 2010.s.458

graphics (Korkmaz, and Ceylan, 2006: 304-305)

One of the most important concepts in technical analysis is trend. Trend is the general direction of any financial product. In some cases, it is quite difficult to pinpoint whether the trend is up or down. Charts do not generally move in a straight line, up or down trends. Graphs often move in a zigzag pattern with ups and downs. In technical analysis, the high and low values of the financial product create the trends. Trend types are divided into three.

1) Uptrend: An uptrend occurs when the prices of the relevant financial product rise continuously by making new highs.

Figure 7. Trendline



2) Downtrend: A downtrend occurs when the prices of the relevant financial product fall continuously by making new lows.

3) Horizontal Trend: If there are very shallow movements at the top and bottom levels, it is called a horizontal trend. It is a trend determination tool for the future with the explanation of the changes in the prices or the amount of transactions in the financial markets with the figures (formations) formed by the graphics and the latest status of the trends. Technical Analysis is an analysis method in which only price movements are taken into account.

Figure 8. Length of the trends

Another important issue regarding trends is the length of the trends. Trends can be long-term, short-term or medium-term. For example, if a trend in stock markets has been going on for more than a year, it is called a long-term trend. Trends that last between 1 month and 3 months are considered medium-term trends, and trends that last less than 1 month are considered short-term trends.

CHAPTER II.PETROCHEMICAL INDUSTRY

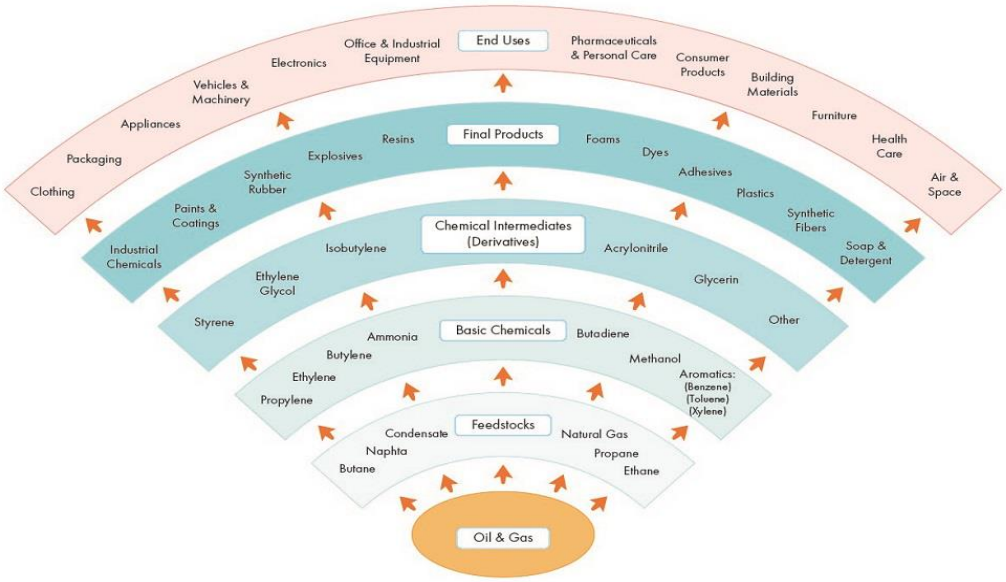
2.1.General Characteristics And Trends Of The Petrochemical Industry

The petrochemical industry has entered all areas of our lives due to its abundance in product diversity. Petrochemical products are used both as raw materials and as intermediate products in many sectors such as pharmaceuticals, cosmetics, soap and detergent, agricultural products, paint, construction, polymer and chemical industry. Expressing petroleum as the "chemical emperor" in his article, Frank J. Soday stated that the oil sector manages the world economy (Soday, 1951, 20). The orientation of countries to oil and petroleum resources has increased due to the presence of oil in all areas of our lives, from transportation to energy, to the chemical sector, where many consumer products are obtained, and especially because it is an indispensable part of modern life. While 30% of the products produced by the petrochemical industry (plastic, cosmetics, detergent, medicine, paint, etc.) are offered directly to the consumer as a final product, 70% of them are in other business lines (textile, electrical goods, metal, metal products, construction, automotive, etc.). paper, service sector) are used as raw materials to obtain new products.(T.R. Ministry of Science, Industry and Technology, Chemical Sector Report, 2014/2). For this reason, the petrochemical industry has an indispensable importance both for our lives and for the continuation of the activities of other sectors.

Oil refining operations have grown substantially over the past two decades, based on the fact that global energy demand will increase by 1.2% per year on average through 2040 (BP, 2019, 135). More than 790 refineries in 116 countries produce oil, gas and petrochemical products to meet the ever-increasing energy needs in the industrial production sector, power generation sector, transportation sector, commercial sectors and maritime sector (Marsh and McLennan, 2014, p.1974, John Rudill, 2005, 4). This shows that oil refineries are important facilities around the world. Oil refineries are complex integrated systems with high capital

and a fixed flow production infrastructure. Petroleum refinery operations and crude oil into various products are being converted. These products are mostly used as raw materials in transportation vehicles, fuel, power generation, heating and chemical process industries. At the beginning of the production chain, there is oil, natural gas and tar, followed by olefins such as ethylene, propylene, butylene, butadiene, and aromatic compounds such as benzene, toluene and xylene. This process then continues with thousands of intermediate product sequences. Some of these intermediate products have commercial value in themselves, while others are purely intermediary products. In the photo below we see the petrochemical products produced in stages.[22] The petrochemical industry is fast becoming the largest driver of global oil consumption.

Figure 9. The Petrochemical Products



Source:(https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/market-snapshots/2018/market-snapshot-petrochemical-products-in-everyday-life.html)

[22] Welch, I. (2003). Capital structure and stock returns. Yale ICF Working Paper, No. 02-03.

The world meets more than 80% of its energy needs from fossil fuels such as coal, oil and natural gas. Fossil fuels are the product of 200 million years of formation, but they have been used as fuel for 1000 years in human history. All of these fossil fuels are formed under similar conditions. Oil formation is provided by various hydrocarbons combined with some minerals such as sulfur under extreme pressure. Today's scientists recognize that most of the oil fields are They proved that they were formed millions of years ago by the remains of small animals and plants compressed on the seabed by billions of tons of dust and sand. When small marine plants and animals die, they sink to the bottom of the sea and mix with sand and dust. Here, bacteria remove the phosphorus, nitrogen and oxygen from this mixture, leaving carbon and hydrogen. As the layers increase, this gelatinous mass is compressed by weight and pressure. Compressed at a depth of about 10000 feet, this mass turns into oil after many years. The formation of naturally occurring crude oil takes millions of years, which is too long for oil to be considered a renewable energy source.The petrochemical industry is a young industry. The petrochemical industry, which sprouted in the early 1920s, started to develop in the 1940s, nearly 90 years after the first oil well was drilled in 1849, and reached maturity in the mid-1970s. World War II opened up new markets for petrochemicals, including jet fuels and synthetic plastics. petrochemical industry,with its natural structure that provides added value and its ever-developing appearance. After World War II, it gathered all the attention. The plastic industry that emerged with the war. It was a first degree important step in the development of petrochemicals and this extraordinary development continued until the end of the 1970s. In the second half of the 1980s, the positive developments in the world economy, the decrease in oil prices and the establishment of large-scale petrochemical complexes in various parts of the world. As a result, the petrochemical industry has entered its most profitable and productive period. 1988 and 1989 were the years when the petrochemical industry was at its best. Between 1990 and 1993, a continuous decrease in profitability was observed as a result of the bad effects of the Gulf War and the recession in the world economy;

Profit margins were at their lowest in 1993 . As a result of the improvement in the world economy, primarily in the western countries, since the second half of 1994, the demand for petrochemical products increased, product prices rose and the petrochemical industry entered a new profitability period in 1995. In 1996 and 1997, there was a period of stagnation in petrochemical profit margins. The global economic and financial crises experienced in 1998, It resulted in an economic downturn in 1999. As a result, the petrochemical sector experienced a decrease in periodic profitability again due to the overcapacity in the world of petrochemicals.

One of the most important reasons for periodic declines in profitability and crisis in the petrochemical industry is excess capacity. The recession in the world economy continued in 2001 and significant new capacity increases were realized in the petrochemical industry. As a result, the petrochemical industry entered the 21st century in a new way entered with a period of decline. The years 2001-2002, the increase in conservative approaches to market consolidation, the September 11 terrorist attacks, the decrease in the influence of medium-sized integrated oil companies on the petrochemical industry and the It has been an extremely difficult period for the petrochemical industry due to the periodic energy shocks that have taken place. In 2001, a new low point occurred in the conjuncture fluctuations of the petrochemical industry. From the second half of 2002, petrochemical demands and growth rates started to increase again. The petrochemical industry has had to withstand many effects that can be described as the "Perfect Storm". With the combination of internal dynamics, the energy crisis and international events, the sector has experienced a turbulent and difficult period. The economic performance of many large companies between 2000 and 2002 is a true indicator of the challenges facing the industry. 2003 was very dynamic and full of surprises. Unsatisfactory factors such as high energy and raw material prices, the Iraq War, the SARS syndrome, low economic growth rates, excess supply, political problems and changes in Argentina, Venezuela, and Brazil adversely affected the petrochemical industry in 2003. However, the downward trend in the long-term conjuncture;

mergers, companies Although it caused significant changes such as its permanent closure, very small amount of sub-industry investments and delays in new investments, it gave impetus to the petrochemical industry in the direction of recovery.2003 has been a transition year for the petrochemical industry and signs of improvement have started to be seen since mid-2003. The demand for petrochemical products is directly related to the economic growth rates of the countries. In particular, the rapid growth in China in recent years also directs economic investments.

The long-awaited milestone in the industry was reached in 2004. Transaction volume and prices increased in the petrochemical industry due to the revival of economies, increasing demand and stocks under the leadership of China, and 2004 was a year of transition to the profitability period and growth in many parts of the world. Oil prices remained high in 2004, around $35-$45/barrel. The most important reasons for these high prices were the continuation of the turmoil in the Middle East, the power of OPEC, especially in Saudi Arabia, the production problems in countries such as Nigeria and Venezuela, the increasing demand for petrochemical products in China and the improving economies.

2.2 Structure And Future Of The Industry

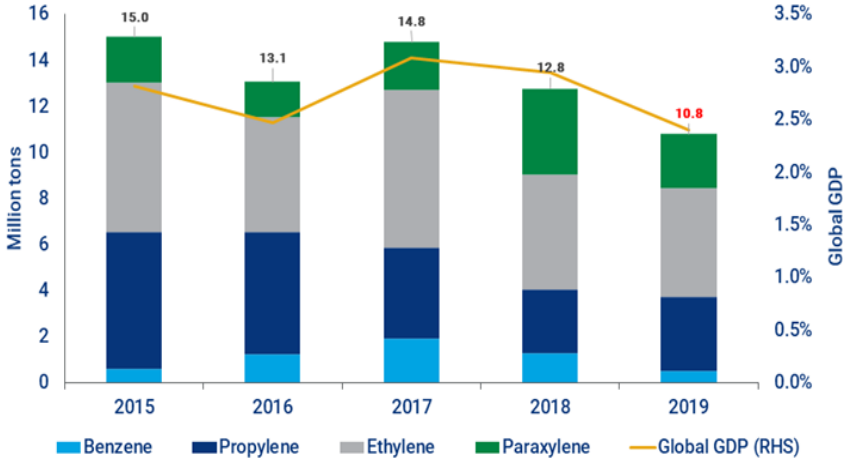
The petrochemical industry, where petroleum products are converted into more valuable products, is a sector with high added value and a wide product range. Today, the products obtained from the petrochemical industry are widely used in the sub-industry. The petrochemical industry, which plays an important role in meeting our basic human needs such as health, hygiene, shelter and food, has also found application in critical areas such as high technology, transportation and entertainment sectors. However, especially with the use of plastic products as a substitute for products produced by many industries (forest products, aluminum, iron and steel, etc.), its importance has started to increase gradually.

Oil prices on the world economy and countries' economies have a huge impact on their growth. Oil prices are also closely related to growth in the petrochemical

sector. In a study conducted by Hamilton in 1983, he found that the US economy had a correlation with the increase in oil prices (Hamilton, 1983, 240). After Hamilton, researchers such as Burbidge (1984), Gisser (1986), Hooker (1996) also conducted studies on this subject and obtained similar results (Burbidge, 1984,461, Gisser, 1986, 98, Hooker, 1996, 196). . Volunteers and working groups investigated the effect of crude oil price changes on the returns of the petrochemical industry in their study in 2015. In this study, the effects of oil prices and the values in stocks on the petrochemical industry index were examined. They revealed that petrochemical indices were affected in line with oil prices and stock values during the period in which these indices were examined (Volunteer, 2015, 224).

Today, petroleum and/or natural gas-based chemicals, namely petrochemicals, have an important place in the chemical industry. The petrochemical industry is a sector that shows a fluctuating trend of growth and profitability depending on global events, economic conditions and the role of regions in the market. When prices and margins increase, markets enter a new era of excess supply, as manufacturers focus on new investment projects, many of which coincide. This cycle in the industry that has been going on for years is doing. Historically, in a cycle where the time between two peaks in cyclical fluctuations in the petrochemical sector is approximately 6-8 years, the period of good market conditions for manufacturers is generally 18-24 months.Global demand growth for PS, another important thermoplastic, is expected to be 3.4% annually on average.

Figure 10. Petrochemical markets



Source:(https://www.woodmac.com/news/opinion/2019-in-review-5-trends-that-shook-the-petrochemical-markets/)

Achieving these goals is still important today, but real growth in the petrochemical industry depends on better customer service, mergers, the development of new products with high market potential and significant market developments. New trends in the industry affect the market. High energy costs cause changes in the place of investments and global trade methods. However, despite high energy prices, the global economy is improving.

In the petrochemical sector, as in other sectors, great changes and developments continue in the three main regions of the world. In addition to new investments, producers prefer to merge in order to reduce their costs and to produce on a scale and in economic conditions. With these mergers, the number of producers in the sector decreases and the capacities per producer increase. Sometimes, company mergers can also be made in order to combine the competitive forces of two companies, to strengthen their main fields of activity by bringing together petrochemical and plastics units.The new manufacturing companies formed as a result of the merger can offer a wide range of products and large quantities of products to potential customers. For manufacturers, mergers in the oil and gas industry have created huge entities operating in the petrochemical and plastics

industry. It is expected that this trend in the sector will continue. In addition to these mergers, important rationalization studies are also being carried out, some of the uneconomical, imported products-based, idle factories are closed.

The developments in electronic commerce have changed the communication ways and the speed of obtaining information between the producer-consumer. Alternative sales systems established by some of the big manufacturers are also the product of the development in information technologies and affect the market. Polypropylene (PP) and Linear Low Density Polyethylene (LDPE), which are in the polyolefins group of plastic raw materials, have started to be traded on the London Metal Exchange. The number of petrochemical products traded on this exchange will increase in the near future. With the introduction of product sales over the internet, it has become easier to access prices and information has become more transparent. In the long run, new electronic commerce models It is thought that there will be an element of balance in imbalances. The development of new techniques and the introduction of new equipment continue to create opportunities for many new combinations that optimize the good properties of each product. The emergence of large consumer groups around the world has been consistent with these developments in the industry.

2.3. Costs In The Petrochemical Industry

Petrochemical costs consist of licensing, production, processing (refining), transportation, distribution and storage expenses. Looking at the distribution of costs, it is seen that 1/3 of the average is due to production and distribution expenses. In 1999, while the production and distribution cost per barrel in some sources in the Middle East may be around 1 dollar, this cost can reach up to 15 dollars in difficult geographical regions such as the North Sea. With such a difference, the average production cost is around 5-6 dollars per barrel (Bayraç, 1999, 94).In general, continuous flow processes are applied in petrochemical plants. Petrochemical products are obtained through a wide variety of chemical reactions. Economy of scale in production is very important. When the production scale is increased by

100%, the unit investment cost decreases by 20%. Large scale production in petrochemical plants also reduces production costs. The costs of transporting the raw materials to the facility and the products obtained from the facility to the customer in petrochemical plants are too high to be underestimated. The risks in transportation of petroleum products used in the petrochemical industry and transportation costs are high due to large amounts of transportation. Distribution costs are highly dependent on distribution patterns.

Petrochemical products are distributed between facilities and consumers by following different ways according to their types and places of use.

Williams (1981) studied production distribution scheduling in the petrochemical industry with seven heuristic algorithms. It is assumed the external demand for the product is at a decisive, constant rate and occurs only in "retail" facilities. The performance 11,000 computer-generated problems, seven heuristics were compared each other ,with a dynamic programming algorithms. This work by Williams is one of the first attempts in the literature to use coordinated planning across multiple levels and areas (Williams, 1981, 330).

This model is explained by the industry equilibrium price, the marginal costs of the firms, and the average industrial behavior. Based on their performance of 11,000 computer-generated problems, seven heuristics were compared with each other and with a dynamic programming algorithm In the petrochemical industry, a set of microdata was used to test the hypothesis that the exchange rate transition is due to uncompetitive behavior by foreign firms..These data are in line with the behavioral assumptions of the basic theoretical model.

CHAPTER III. RESEARCH

3.1 Introduction and Research Methodology

The aim of the study is to examine the effect of the capital structure on the stock returns of selected petrochemical companies traded in the Stock Exchanges of the world countries in the period of 2016-2021. The research is focused on companies that have an important place in 13 countries located in different parts of the world, making a difference in the economy of both the country and the world. The sources of data for this research are Yahoo! Finance and Morningstar. Correlation and regression method were used for the present study. The functional relationship between the explanatory variables was described using pair-wise correlation. The coefficients stock returns and leverage determine whether the connection is positive or negative (Wooldridge 2013, p. 20). The analysis carried out with the computer programs spss and python.

Regression model

SRit= β0+β1LEV itβ2SZit+ β4 GWit+β5 LQit

SRiit= Stock returns at time t

LEVit= Leverage at time t

SZit= Size of company at time t

GWit= Growth of company at time t

LQit= Liquidity ratio at time

Table 1.Variables

Dependent Variable	Stock Return	(StockPricet-StockPricet-1) /Stock Price t-1
independent Variables	Leverage	(ShortTermBorrowing+Long TermBorrowing)/TotalAssets
Control variables	Liquidity	CurrentAssets/CurrentLiabilities
	Size	Total Assets
	Growth	(TotalAssetstTotalAssetst1)/TotalAssetst-1

3.2 Hypothesis Test

In this section, the applications made in order to measure the effect of capital structure and stock performance on the petrochemical sector and to determine the factors affecting the stock are given. Before introducing the research hypotheses and the data set, the necessity of measuring the effect of capital structure on stock value and performance is mentioned.Finally, research hypotheses, data set, statistical models and analysis methods and the findings obtained as a result of these methods are discussed respectively.

Hypothesis

H0: There is no significant impact of capital structure on stock return of select Petrochemical industry companies

H1: Null hypothesis rejected

3.3 Previous Studies

Modigliani and Miller (1958) are known as the forefathers of capital structure theory.They give a theoretical understanding of how a company's value will remain constant regardless of the capital structure adopted. This means that changing the magnitudes of a company's capital structure will not change the overall value of its existing assets. Modigliani and Miller created three alternative models: Without taxes, the M&M percentage shows that the value of the leveraged company is the same as the value of the unleveraged company. The value of this company is not affected by its capital structure (Modigliani & Miller 1958). This ratio is based on the fact that traders can create leverage; This means that it can borrow money on the same terms as companies.One of the most important breakthroughs in the realm of corporate finance is the concept of homemade leverage (Ross, Westerfield & Jaffe 1993) Without taxes, the M&M proportion concludes that you cannot convert equity to debt to lower the overall cost of capital.

The trade-off theory is the only one of these two that employs a formula to determine the best capital structure. The theory of pecking order aims to explain the optimal capital structure using words (Copeland & Weston 1992). This indicates that

the best capital structure is one in which the benefit of taking on more debt is outweighed by the greater expenses of bankruptcy. Equity is a less preferable method of financing a company, according to the pecking order theory, because investors believe that managers only issue additional equity when the existing stock is overvalued. There is empirical evidence that the issue of new shares results in a decrease in stock prices (Baker & Martin 2011). According to the pecking order hypothesis, a corporation should only seek external finance when internal funds are insufficient (Graham & Harvey 2001). When a corporation seeks external finance, it always opts for debt rather than issuing stock.

The majority of studies have looked on how capital structure affects stock returns (Bhandari, 1988). Although other research differ (Welch 2003). (Welch 2003). According to some studies, stock returns and capital structure have a synergistic effect (Yang, Lee, Gu & Lee 2010). Few research have found that stock returns reduce leverage (Hall (1967), Kortweg (2004), Dimitrov and Jain (2005)). This could be due to variations in sample sizes, procedures employed, and methodologies used in different nations. Masulis (1983) discovered that changes in leverage were positively associated to changes in stock returns in his research. His study's sample includes all groups of enterprises that use pure capital structure modifications. The study investigates whether changes in short-term value are caused by changes in leverage caused by swap offers and recapitalizations. To calculate the cross-sectional variation in stock returns, Strong and Xu (1997) and Fama and French (1992) employed book-to-market equity and size. The analysis found that stock returns were positively and adversely linked with market and book value, respectively.

Adami Et Al. (2010) used 2673 businesses traded on the London Stock Exchange from 1980 to 2008 to study the association between stock performance and leverage. Financial leverage and stock return have a negative link, according to the study. They discovered that enterprises with higher tax rates had better returns when they used the CAPM to compute the approximate return.

Yang, Lee, Gu, and Lee (2010) used simultaneous equations to measure two-way causality. And he discovered that stock returns and capital structure are endogenous variables. His work was a follow-up to Titman and Wessels (1988), in which he used a single equation to investigate the drivers of capital structure. Leverage, profitability, and liquidity were found to be the most important factors. Stock returns are influenced by factors such as expected growth and value. Saliha and Abdessatar (2011) reported a consistent outcome, as did Babalola (2013). According to Shepard (1972), firm size and profitability have a substantial negative connection, which Simon (1962) Banchuenvijit (1962)

3.4 Empirical Results And Analysis

Short descriptive coefficients summarize a data set, which can be typical of the full population or a sample. Measure central tendency and variability are two forms of descriptive statistics. Mean, median, mode were examples of central tendency measure, when standard deviation, variance, minimum, maximum variable, kurtosis, skewness are variabilities measure . The correlation coefficient is a the strength of a numerical relationship of between two variables. The value the correlation coefficient range is -1.0 to 1.0. The correlation coefficient was 1 in a positive correlation. Negative correlation defines that two assets moving in opposite. Zero correlation specify that there is not linear relationships. The mean (average) of a data set is found by adding all numbers in the data set and then dividing by the number of values in the set. The median is the middle value when a data set is ordered from least to greatest. The mode is the number that occurs most often in a data set

Table 2. Descriptive Statistics

Statistics

		Stock_Return	Leverage	Liquidity	Size_million	Growth
N	Valid	200	200	200	200	200
	Missing	0	0	0	0	0
Mean		.1415	2.5694	1.6819	6.8909E5	.1187
Std. Error of Mean		.02116	.06732	.03908	2.25119E5	.04115
Median		.1300	2.3150	1.6400	29356.5000	.0350
Mode		.00	2.08[a]	1.34	404.00[a]	.00
Std. Deviation		.29923	.95211	.55269	3.18366E6	.58192
Variance		.090	.907	.305	1.014E13	.339
Skewness		1.876	2.708	.504	6.475	8.985
Std. Error of Skewness		.172	.172	.172	.172	.172
Kurtosis		10.786	12.781	-.232	43.074	93.776
Std. Error of Kurtosis		.342	.342	.342	.342	.342
Range		2.79	7.74	2.85	2.57E7	7.56
Minimum		-.60	1.35	.74	404.00	-.80
Maximum		2.19	9.09	3.59	2.57E7	6.76
Sum		28.29	513.88	336.39	1.38E8	23.74

a. Multiple modes exist. The smallest value is shown

Tables describes the selected petrochemical firms that the mean value for stock returns 0.1415 with a standard deviation of 0.29923. The highest stock return recorded in the market with in the period is 2.19 while the smallest is -0.60. Stock Returns positively skewed with a positive skewness 1.88 . Leverage has a mean value 2.5694 with a standard deviation of 0.95211. The maximum leverage is 9.09 while the least is 1.35. Liquidity ratio has a mean value of 1.6819 with a standard deviation of 0.55269. The size of a firm has a mean value was 6.89 with a standard deviation of 3.18 The Growth has a mean value of 0.1187 with a standard deviation being .04115. The highest value is 6.76 while the lowest is -0.80. Growth positively skewed with 93.8 kurtosis

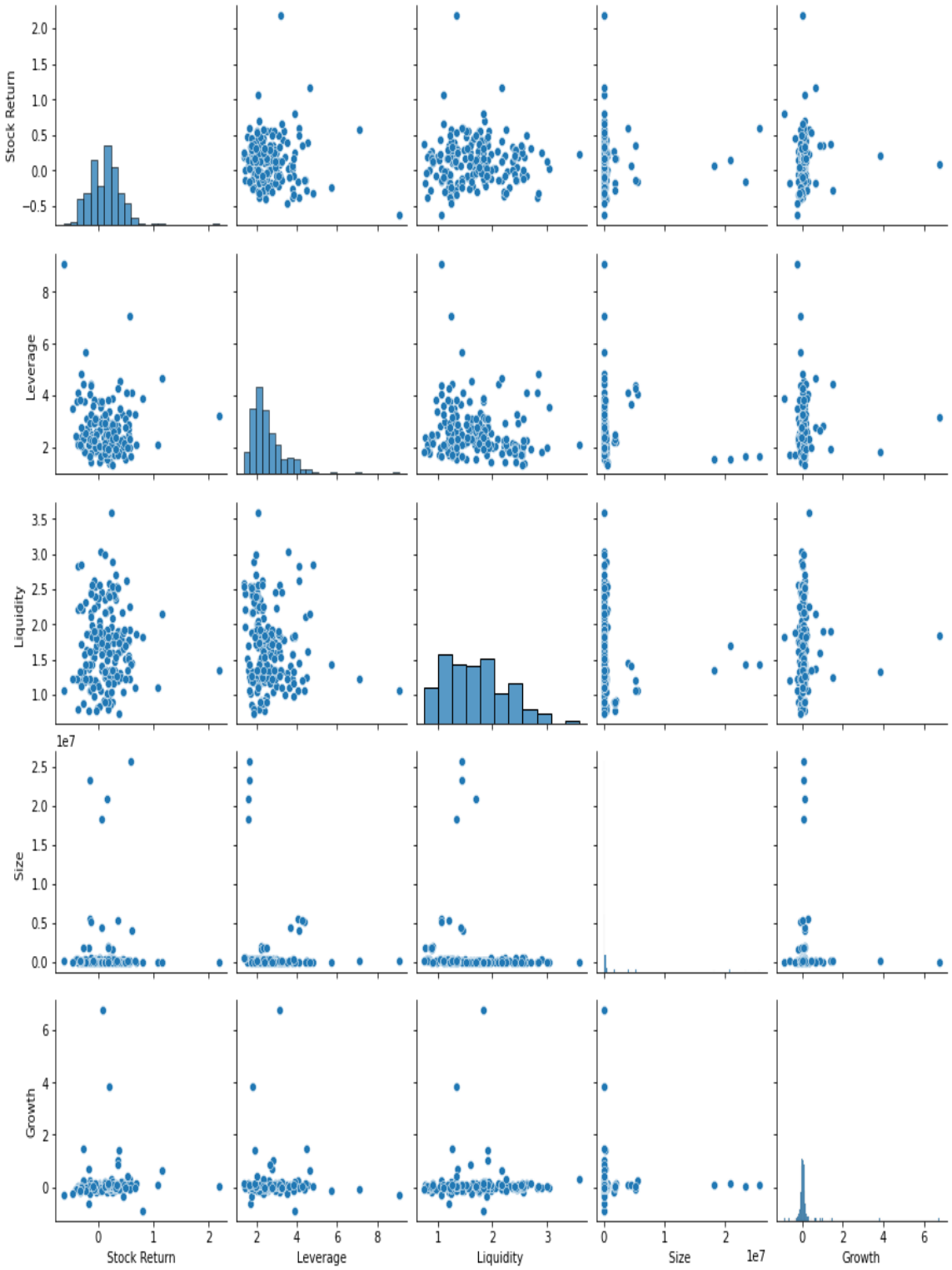
Table 3. Correlation

	Stock Return	Leverage	Liquidity	Size	Growth
Stock Return	1.00	-0.07	0.03	0.02	0.05
Leverage	-0.07	1.00	-0.14	-0.09	0.02
Liquidity	0.03	-0.14	1.00	-0.11	0.02
Size	0.02	-0.09	-0.11	1.00	-0.01
Growth	0.05	0.02	0.02	-0.01	1.00

As can be seen in Table 4, none of the explanatory variables have a correlation greater than 0.9, indicating that the variables are not affected by multicollinearity. It's a perfect negative correlation when the correlation is -1, and there's no correlation when the numbers are 0.There are very weak relationships between our variables.The following is taken from the table above: It is clear that leverage and liquidity have a negative relationship, but size, growth, and size have a positive relationship with stock return. Liquidity and growth have a negative relationship with size, when other variables have a positive relationship with leverage growth .

Looking at the figures in the table, it is possible to determine what kind of relationship is between the variables. Whether it's positive or negative, the numbers don't make much difference. Looking at these results, it is not difficult to guess in which direction the research is headed. Correlation in Research helps us navigate. The value of the Correlation Coefficient also indicates how much the dots scatter from the best-fitted line. The closer the value is to 1 or -1, the less scattering around the line, and the farther away it is, the greater the scattering.

Figure 11. Correlation



As can be seen from the figure, the variables cannot help us get an important result. These distributions, which are in a very irregular way, and it is very difficult

for us to be the result.It is clearly seen in the graphics that there is no liner relationship

Table 4. Regression

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.079[a]	.006	-.014	.301325	.006	.310	4	195	.871

a. Predictors: (Constant), Growth, Size_Millions, Leverage, Liquidity

b. Dependent Variable: Stock_Returns

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.112	4	.028	.310	.871[a]
	Residual	17.705	195	.091		
	Total	17.818	199			

a. Predictors: (Constant), Growth, Size_Millions, Leverage, Liquidity

b. Dependent Variable: Stock_Returns

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	.171	.098		1.744	.083	-.022	.364					
	Leverage	-.019	.023	-.061	-.842	.401	-.064	.026	-.064	-.060	-.060	.968	1.033
	Liquidity	.010	.039	.018	.247	.805	-.068	.087	.025	.018	.018	.965	1.036
	Size_Millions	1.525E-9	.000	.016	.225	.822	.000	.000	.019	.016	.016	.977	1.024
	Growth	.021	.037	.041	.572	.568	-.051	.093	.040	.041	.041	.999	1.001

a. Dependent Variable: Stock_Returns

Table 5 shows the regression findings, which show that the model explains about 0.6 percent of the variation in the endogenous variable. When the residual sum of squares approaches the entire sum of squares, a negative adjusted R square appears, indicating that the explanation for the response is very low or non-existent. As a result, a negative adjusted R square indicates that explanatory factors are insignificant. The P value of 0.871, which is greater than (0.05)

Table 5. Descriptive Statistics in the year 2017 for select firms

Descriptive Statistics

	Mean	Std. Deviation	N
Stock_Return	.2638	.19002	40
Leverage	2.5170	.75168	40
Liquidity	1.7303	.51421	40
Size_million	6.8546E5	2.92862E6	40
Growth	.0910	.30518	40

Table 6. Correlations in the year 2017 for select firms

Correlations

		Stock_Return	Leverage	Liquidity	Size_million	Growth
Stock_Return	Pearson Correlation	1	.591**	.233	-.119	-.063
	Sig. (2-tailed)		.000	.148	.464	.701
	Sum of Squares and Cross-products	1.408	3.293	.888	-2.588E6	-.142
	Covariance	.036	.084	.023	-66362.313	-.004
	N	40	40	40	40	40
Leverage	Pearson Correlation	.591**	1	-.064	-.152	-.143
	Sig. (2-tailed)	.000		.696	.348	.378
	Sum of Squares and Cross-products	3.293	22.036	-.962	-1.308E7	-1.282
	Covariance	.084	.565	-.025	-3.355E5	-.033
	N	40	40	40	40	40
Liquidity	Pearson Correlation	.233	-.064	1	-.171	.093
	Sig. (2-tailed)	.148	.696		.292	.568
	Sum of Squares and Cross-products	.888	-.962	10.312	-1.004E7	.570
	Covariance	.023	-.025	.264	-2.574E5	.015
	N	40	40	40	40	40
Size_million	Pearson Correlation	-.119	-.152	-.171	1	.002
	Sig. (2-tailed)	.464	.348	.292		.989
	Sum of Squares and Cross-products	-2.588E6	-1.308E7	-1.004E7	3.345E14	8.113E4
	Covariance	-66362.313	-3.355E5	-2.574E5	8.577E12	2.080E3
	N	40	40	40	40	40
Growth	Pearson Correlation	-.063	-.143	.093	.002	1
	Sig. (2-tailed)	.701	.378	.568	.989	
	Sum of Squares and Cross-products	-.142	-1.282	.570	81125.189	3.632
	Covariance	-.004	-.033	.015	2080.133	.093
	N	40	40	40	40	40

**. Correlation is significant at the 0.01 level (2-tailed).

In the year 2017 From the above table: 5 It is evident leverage and liquidity show a negative correlation with size while size ,liqudity and leverage shows a positive correlation with stock return. Growth and size has negative correlation with stock return and leverage others variables shows a positive correlation with capital structure.

Table 7. Regression Results for year 2017

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.651[a]	.423	.358	.15230

a. Predictors: (Constant), Growth, Size_million, Liquidity, Leverage

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.303	.128		-2.374	.023
	Leverage	.155	.033	.612	4.647	.000
	Liquidity	.102	.049	.276	2.101	.043
	Size_million	1.371E-9	.000	.021	.160	.874
	Growth	.000	.081	.000	-.006	.995

a. Dependent Variable: Stock_Return

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.596	4	.149	6.426	.001[a]
	Residual	.812	35	.023		
	Total	1.408	39			

a. Predictors: (Constant), Growth, Size_million, Liquidity, Leverage

b. Dependent Variable: Stock_Return

In the year 2017, the research presents relationship between stock returns and capital structure of the selected firms in petrochemical . Measure of stock return was regressed against measure of capital structure along with control variables. Regression results were presented in that model explain 35.8 % of the variation in the variable. This means that, the remaining 64.2 % of variance with stock returns is contributed by other factors. F statistic for stock return is 6.426 profitability

found to have a strong favorable impact on capital structure as measured by Stock return while liquidity, size and growth has negative but insignificant impact on stock return. P value is .001 which is less than (0.05)

Table 8. Correlations in the year 2018 for select firms

Descriptive Statistics

	Mean	Std. Deviation	N
Stock_Return	.1323	.14864	40
Leverage	2.3230	.54283	40
liquidity	1.7430	.52831	40
Size	7.5722E5	3.33263E6	40
Growth	.3252	1.21438	40

Correlations

		Stock_Return	Leverage	liquidity	Size	Growth
Stock_Return	Pearson Correlation	1	-.232	.015	.018	-.004
	Sig. (2-tailed)		.149	.926	.914	.983
	Sum of Squares and Cross-products	.862	-.730	.047	3.420E5	-.025
	Covariance	.022	-.019	.001	8.769E3	.000
	N	40	40	40	40	40
Leverage	Pearson Correlation	-.232	1	.020	-.158	.161
	Sig. (2-tailed)	.149		.902	.330	.322
	Sum of Squares and Cross-products	-.730	11.492	.226	-1.115E7	4.133
	Covariance	-.019	.295	.006	-2.858E5	.106
	N	40	40	40	40	40
liquidity	Pearson Correlation	.015	.020	1	-.060	-.053
	Sig. (2-tailed)	.926	.902		.713	.744
	Sum of Squares and Cross-products	.047	.226	10.885	-4.124E6	-1.333
	Covariance	.001	.006	.279	-1.057E5	-.034
	N	40	40	40	40	40
Size	Pearson Correlation	.018	-.158	-.060	1	-.038
	Sig. (2-tailed)	.914	.330	.713		.816
	Sum of Squares and Cross-products	341972.759	-1.115E7	-4.124E6	4.331E14	-6.011E6
	Covariance	8768.532	-2.858E5	-1.057E5	1.111E13	-1.541E5
	N	40	40	40	40	40
Growth	Pearson Correlation	-.004	.161	-.053	-.038	1
	Sig. (2-tailed)	.983	.322	.744	.816	
	Sum of Squares and Cross-products	-.025	4.133	-1.333	-6.011E6	57.514
	Covariance	.000	.106	-.034	-1.541E5	1.475
	N	40	40	40	40	40

From the above table in year 2018 stock returns have negative correlation with leverage.Stock Returns have negative correlation with growth.Leverage have positive correlation with growth.

Table 9. Regression Results for year 2018

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.236[a]	.056	-.052	.15246	.056	.517	4	35	.723

a. Predictors: (Constant), liquidity, Leverage, Size, Growth

b. Dependent Variable: Stock_Return

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.048	4	.012	.517	.723[a]
	Residual	.814	35	.023		
	Total	.862	39			

a. Predictors: (Constant), liquidity, Leverage, Size, Growth

b. Dependent Variable: Stock_Return

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	.275	.136		2.024	.051	.000	.550		
	Leverage	-.066	.046	-.241	-1.431	.161	-.160	.028	.951	1.052
	Size	-7.926E-10	.000	-.018	-.107	.916	.000	.000	.972	1.029
	Growth	.004	.020	.036	.214	.832	-.037	.046	.971	1.030
	liquidity	.006	.046	.021	.127	.900	-.088	.100	.993	1.007

a. Dependent Variable: Stock_Return

In the year 2018 the research shows the relationship between stock returns and capital structure of the selected firms in petrochemical industry. Regression results are shown in Table . P value is 0.723 which is greater than (0.05)

Table 10. Correlations in the year 2019 for select firms

Descriptive Statistics

	Mean	Std. Deviation	N
Stock_Return	-.0610	.19722	40
Leverage	2.4450	.77359	40
Liquidity	1.6495	.54741	40
Size	2.5944E5	9.08774E5	40
Growth	.0582	.26314	40

Correlations

		Stock_Return	Leverage	Liquidity	Size	Growth
Stock_Return	Pearson Correlation	1	-.454**	-.030	-.101	-.133
	Sig. (2-tailed)		.003	.852	.535	.413
	Sum of Squares and Cross-products	1.517	-2.701	-.128	-7.056E5	-.269
	Covariance	.039	-.069	-.003	-1.809E4	-.007
	N	40	40	40	40	40
Leverage	Pearson Correlation	-.454**	1	-.017	.272	.491**
	Sig. (2-tailed)	.003		.917	.089	.001
	Sum of Squares and Cross-products	-2.701	23.339	-.282	7.459E6	3.896
	Covariance	-.069	.598	-.007	1.913E5	.100
	N	40	40	40	40	40
Liquidity	Pearson Correlation	-.030	-.017	1	-.273	-.081
	Sig. (2-tailed)	.852	.917		.089	.619
	Sum of Squares and Cross-products	-.128	-.282	11.687	-5.290E6	-.455
	Covariance	-.003	-.007	.300	-1.356E5	-.012
	N	40	40	40	40	40
Size	Pearson Correlation	-.101	.272	-.273	1	.129
	Sig. (2-tailed)	.535	.089	.089		.427
	Sum of Squares and Cross-products	-705620.240	7.459E6	-5.290E6	3.221E13	1.204E6
	Covariance	-18092.827	1.913E5	-1.356E5	8.259E11	3.087E4
	N	40	40	40	40	40
Growth	Pearson Correlation	-.133	.491**	-.081	.129	1
	Sig. (2-tailed)	.413	.001	.619	.427	
	Sum of Squares and Cross-products	-.269	3.896	-.455	1.204E6	2.700
	Covariance	-.007	.100	-.012	3.087E4	.069
	N	40	40	40	40	40

**. Correlation is significant at the 0.01 level (2-tailed).

From the above table in year 2019 stock returns have negative correlation with leverage. Stock Returns have negative correlation with growth . Leverage have positive correlation with growth

Table 11. Regression Results for year 2019

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.467[a]	.218	.128	.18412	.218	2.437	4	35	.065

a. Predictors: (Constant), Growth, Liquidity, Size, Leverage

b. Dependent Variable: Stock_Return

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.331	4	.083	2.437	.065[a]
	Residual	1.186	35	.034		
	Total	1.517	39			

a. Predictors: (Constant), Growth, Liquidity, Size, Leverage

b. Dependent Variable: Stock_Return

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	.270	.138		1.947	.060	-.011	.551					
	Leverage	-.132	.045	-.516	-2.906	.006	-.224	-.040	-.454	-.441	-.434	.708	1.412
	Liquidity	-.009	.056	-.025	-.160	.873	-.123	.105	-.030	-.027	-.024	.915	1.093
	Size	3.833E-9	.000	.018	.109	.914	.000	.000	-.101	.018	.016	.853	1.172
	Growth	.087	.129	.116	.674	.505	-.175	.349	-.133	.113	.101	.753	1.328

a. Dependent Variable: Stock_Return

In the year 2019 the study shows that Stock return was regressed against capital structure along with control variables. Regression result was presented in Table show 12.8 % of the variation variable. This means that, the remaining 87.2 % of variance with stock returns is contributed by other factors. F statistic for stock return is 2.437 capital structure liquidity and profitability found to have a strong favorable impact on capital structure as measured by Stock return while size and growth have negative impact on stock return. P value is . 065 which is greater than (0.05)

Table 12. Correlations in the year 2020 for select firms

Descriptive Statistics

	Mean	Std. Deviation	N
Stock_Return	-.14375	.197298	40
Leverage	2.86125	1.382002	40
Liquidity	1.71800	.646205	40
Size	8.3647E5	3.746845E6	40
Growth	-.00850	.121835	40

Table shows us stock return mean is -0.14375. Levereage mean is 2.86125. Liquidity mean is 1.718 . Size mean is 8.36

Correlations

		Stock_Return	Leverage	Liquidity	Size	Growth
Stock_Return	Pearson Correlation	1	-.459**	.346*	-.021	.530**
	Sig. (2-tailed)		.003	.029	.896	.000
	Sum of Squares and Cross-products	1.518	-4.877	1.720	-6.126E5	.497
	Covariance	.039	-.125	.044	-1.571E4	.013
	N	40	40	40	40	40
Leverage	Pearson Correlation	-.459**	1	-.215	-.112	-.360*
	Sig. (2-tailed)	.003		.182	.491	.022
	Sum of Squares and Cross-products	-4.877	74.487	-7.505	-2.264E7	-2.365
	Covariance	-.125	1.910	-.192	-5.805E5	-.061
	N	40	40	40	40	40
Liquidity	Pearson Correlation	.346*	-.215	1	-.125	.436**
	Sig. (2-tailed)	.029	.182		.441	.005
	Sum of Squares and Cross-products	1.720	-7.505	16.286	-1.183E7	1.338
	Covariance	.044	-.192	.418	-3.034E5	.034
	N	40	40	40	40	40
Size	Pearson Correlation	-.021	-.112	-.125	1	.075
	Sig. (2-tailed)	.896	.491	.441		.648
	Sum of Squares and Cross-products	-612587.694	-2.264E7	-1.183E7	5.475E14	1.327E6
	Covariance	-15707.377	-5.805E5	-3.034E5	1.404E13	3.403E4
	N	40	40	40	40	40
Growth	Pearson Correlation	.530**	-.360*	.436**	.075	1
	Sig. (2-tailed)	.000	.022	.005	.648	
	Sum of Squares and Cross-products	.497	-2.365	1.338	1.327E6	.579
	Covariance	.013	-.061	.034	3.403E4	.015
	N	40	40	40	40	40

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

From the above table in year 2020 stock returns have negative correlation with leverage. Stock Returns have positive correlation with growth.Leverage have negative correlation with growth

Table 13. Regression Results for year 2020

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.616[a]	.380	.309	.164025	.380	5.357	4	35	.002

a. Predictors: (Constant), Growth, Size, Leverage, Liquidity

b. Dependent Variable: Stock_Return

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.576	4	.144	5.357	.002[a]
	Residual	.942	35	.027		
	Total	1.518	39			

a. Predictors: (Constant), Growth, Size, Leverage, Liquidity

b. Dependent Variable: Stock_Return

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	-.066	.107		-.610	.546	-.284	.153					
	Leverage	-.044	.021	-.307	-2.136	.040	-.086	-.002	-.459	-.340	-.284	.856	1.168
	Liquidity	.032	.046	.106	.703	.486	-.061	.126	.346	.118	.094	.779	1.283
	Size	-3.718E-9	.000	-.071	-.518	.608	.000	.000	-.021	-.087	-.069	.953	1.049
	Growth	.613	.253	.378	2.424	.021	.100	1.126	.530	.379	.323	.727	1.375

a. Dependent Variable: Stock_Return

In the year 2020, the study presents the empirical relationship between stock returns and capital structure of the select firms in petrochemical. Regression results are presented in table shows that model explains around 30.9 % of the variation in the endogenous variable. This means that, the remaining 69.1 % of variance with stock returns is contributed by other factors

Table 14. Correlations in the year 2021 for select firms

Correlations

		Stock_returns	Leverage	Liquidity	Size	Growth
Stock_returns	Pearson Correlation	1	.171	-.026	.047	.163
	Sig. (2-tailed)		.292	.872	.774	.314
	Sum of Squares and Cross-products	5.131	2.528	-.196	2.730E6	.331
	Covariance	.132	.065	-.005	7.001E4	.008
	N	40	40	40	40	40
Leverage	Pearson Correlation	.171	1	-.256	-.112	.106
	Sig. (2-tailed)	.292		.111	.491	.513
	Sum of Squares and Cross-products	2.528	42.602	-5.487	-1.878E7	.623
	Covariance	.065	1.092	-.141	-4.816E5	.016
	N	40	40	40	40	40
Liquidity	Pearson Correlation	-.026	-.256	1	-.081	.240
	Sig. (2-tailed)	.872	.111		.620	.136
	Sum of Squares and Cross-products	-.196	-5.487	10.771	-6.806E6	.705
	Covariance	-.005	-.141	.276	-1.745E5	.018
	N	40	40	40	40	40
Size	Pearson Correlation	.047	-.112	-.081	1	-.023
	Sig. (2-tailed)	.774	.491	.620		.889
	Sum of Squares and Cross-products	2730363.032	-1.878E7	-6.806E6	6.593E14	-5.225E5
	Covariance	70009.309	-4.816E5	-1.745E5	1.691E13	-1.340E4
	N	40	40	40	40	40
Growth	Pearson Correlation	.163	.106	.240	-.023	1
	Sig. (2-tailed)	.314	.513	.136	.889	
	Sum of Squares and Cross-products	.331	.623	.705	-5.225E5	.802
	Covariance	.008	.016	.018	-1.340E4	.021
	N	40	40	40	40	40

From the above table in year 2021 stock returns have positive correlation with leverage. Stock Returns have positive correlation with growth.Leverage have negative correlation with size

Table 15. Regression Results for year 2020

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.235[a]	.055	-.053	.372128	.055	.513	4	35	.727

a. Predictors: (Constant), Growth, Size, Leverage, Liquidity

b. Dependent Variable: Stock_returns

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.284	4	.071	.513	.727[a]
	Residual	4.847	35	.138		
	Total	5.131	39			

a. Predictors: (Constant), Growth, Size, Leverage, Liquidity

b. Dependent Variable: Stock_returns

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B		Correlations			Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part	Tolerance	VIF
1	(Constant)	.271	.285		.952	.348	-.308	.850					
	Leverage	.055	.061	.158	.905	.372	-.068	.178	.171	.151	.149	.887	1.128
	Liquidity	-.012	.123	-.017	-.095	.925	-.261	.238	-.026	-.016	-.016	.851	1.176
	Size	5.886E-9	.000	.067	.401	.691	.000	.000	.047	.068	.066	.974	1.027
	Growth	.384	.435	.152	.883	.383	-.499	1.268	.163	.148	.145	.912	1.097

a. Dependent Variable: Stock_returns

In the year 2021, the study presents the empirical relationship between stock returns and capital structure of the select firms in petrochemical. P value is .0727 which is greater than (0.05) indicates weak evidence against the null hypothesis, so fail to reject the null hypothesis. There is no significant impact of capital structure on stock return of select companies during the period 2021

CONCLUSION

It is important to create an optimal capital structure in order to increase the market value of the enterprise, which is the most important goal of the enterprises, and the welfare level of the partners. Finance managers try to create a capital structure that provides the best alternative between earnings and risk.

Correlation is a measure of how variables change together. The correlation coefficient takes values between -1 and +1 mathematically. The magnitude of the correlation (0-1) indicates the strength of the relationship between the two variables, while the sign (+,-) indicates that the variables increase or decrease in the same direction (+) or increase and decrease in opposite directions (-).The correlation (r) value calculated between two variables: $r<0.20$ and values close to zero indicate no relationship or a very weak relationship. Between 0.20-0.39, a weak relationship. If between 0.40-0.59, a moderate relationship, between 0.60-0.79, a high-level relationship If it is 0.80-1.0, it is interpreted that there is a very high correlation. As a result of our research, it was found that there is a relationship between stock returns and capital structure -0.07. When we look at the relationship with other variables in order to consolidate the result we have obtained, we cannot reach much conclusion. There is 0.05 relationship between Stock returns and growth and 0.03 between stock returns and 0.02 between liquidity and Stock returnsWhen we look at the relationship with other variables in order to consolidate the result we have obtained, we cannot reach much conclusion. The correlation (r) value calculated between two variables: $r<0.20$ and values close to zero indicate no relationship

When the probability p as a result of statistical package programs is 5% or less, that is, $p\leq0.05$, the H0 hypothesis is rejected and the findings are stated to be statistically significant. When $p>0.05$, the H0 hypothesis is accepted, that is, it is interpreted that the findings are not statistically significant. The P value of 0.871, which is greater than (0.05), shows that the H0 hypothesis is accepted, that is, it is interpreted that the findings are not statistically significant

A study of selected companies in the petrochemical sector shows that the impact between share income and capital structure is very weak. This can be assessed as a specific feature of the sector. Although the creation of such companies requires a large investment, it takes a long time for the company to become profitable. The companies represented in the sector are of strategic importance not only for their countries but also for the world. The vast majority of strategically important companies are state-owned or state-supported, which affects its capital structure. It should be noted that the negative consequences of the COVID-19 coronavirus pandemic, which began in 2019, did not go unnoticed in this sector. Also, the trend of "green economy" is directed to the petrochemical sector, as it is to the world.The relationship between capital structure and stock performance of chosen petrochemical firms from 2016 to 2021 is examined in this study. The findings of this study varies depending on the time period.

Based on years , 2016-2021 different results are reached.Acording to the results of the year compared to the most common finds that there is a no relationship.Research time, we are taking over as the only factor predetermined variables. The key variables are stock returns and the capital structure, and the control variables are growth, so you need to consider important events in both years over the years as well as liquidity. A company's stock prices are affected by events in the country as well as events in the world. In recent years, many studies have been carried out on capital structure in our country and abroad. Capital structure decisions may differ due to the development levels of the countries and the different characteristics of the sectors. In developed countries, financial markets have more funding alternatives due to the fact that there are more savings opportunities and there are many financial products. However, the lack of sufficient capital accumulation in developing countries and the fact that financial products are too limited compared to developed countries limit the financing alternatives.

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