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THE ESSENTIAL ROLE OF INTERNATIONAL TRADE ON ECONOMIC GROWTH

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ABSTRACT

Purpose- One of the most fundamental elements of the world economy is international trade. International trade is important in terms of supporting the development and economic growth of countries. In this context, the most important goal of countries is to increase their exports and reduce their imports. However, the impact of foreign trade on economic growth may vary in the short and long run. In addition, determining the quantitative effects of these variables on each other may be important for the development of national economies.

Methodology- In line with these objectives, in this study, growth, export and import figures of G-20 countries for the last 25 years are taken. Co-integration tests are used to examine the long-run relationship between the variables. In addition, Wald Tests were used to investigate the short-run relationship. The mutual causality relations of the variables were analyzed with causality tests.

Findings- According to the findings of the study, the effect of exports and imports on economic growth has been proven. With these results, it is clearly stated by co-integration tests that the export and import development of countries can support their economic growth in the long run. Moreover, in the short run, there is a bi-directional causality relationship between exports and economic growth and between imports and economic growth.

Conclusion- The relationship between economic growth and foreign trade is multifaceted and affected by many factors. However, the importance of foreign trade for the national economy is seen in the short and long run.

Keywords: Economic growth, foreign trade, exports, imports, GDP, co-integration.

JEL Codes: B17, F40, F63

1. INTRODUCTION

Globalization has brought about considerable changes in the international economy in recent years. With the spread of globalization, national economies have become global economies. The transition process towards a single economy has begun worldwide. As a result, countries have become more dependent on each other economically. In this context, each country has been affected by the global crisis to the extent of its fragility. Globalization has increased the world economy and international trade growth due to free trade agreements, technological developments, and international cooperation. However, due to the Covid-19 epidemic in 2020, a severe contraction was observed in the world economy. Fiscal policies taken as measures against the epidemic have significantly increased the default risk of countries (Özparlak et al., 2021a). In 2021 the world economy started to recover, and economic growth accelerated. Economic growth (EG) is the increase in the total production, trade, and business activities in a country's economic activities. This increase is usually measured as GDP (Gross Domestic Production) or GNP (Gross National Production). The EG of a country means the continuous growth of the GDP per capita of that country. EG is of great importance for all countries. EG can be driven by increased productivity in a country's economy, investment in labor and capital, technological advances, trade, and other factors.

*This article was produced from the master's thesis "The Relationship Between Economic Growth and Foreign Trade" presented to Istanbul Beykent University Graduate Education Institute in 2023 (Kircicek, T. 2023).

The main objective of EG is to increase the welfare of a country. EG helps to raise a country's production and consumption levels, which in turn helps to increase income and a higher standard of living. In addition, the qualitative development of EG is also essential. The U.N. (2015) report mentions that stable, inclusive, sustainable EG and full and productive employment should be supported (Özparlak, 2022).

As a result, EG is an essential factor that can increase a country's economic well-being. EG is the increase in the ability to produce goods and services. EG is one of the most important goals of countries worldwide. Because EG helps to increase the income levels of the nations, raise the standard of living and improve the welfare of the people.

EG can occur in different ways under the influence of various factors. Therefore, several different types of EG have been described in the economics literature. However, the factors affecting economic development are complex and multifaceted. Each country's conditions, resources, and policies can affect growth differently. Therefore, it is vital to consider the country's unique conditions to make a detailed assessment of the growth analysis. The combination of factors affecting growth determines a country's EG rate. The economy's total output (GDP), and therefore EG, results from combining these factors. The main determinants of growth can be explained as the availability and effective use of resources against supply and demand (Sevcan et al., 2019).

Some types of EG are shared below.

Concentrative Growth: This type of growth is a model in which economic activity is concentrated in a particular sector or a particular region, and this concentration increases the growth rate. For example, rapid industrial development in a region can trigger growth.

Resource Dependence: This type of growth is a type of EG that relies on a particular resource. For example, countries that grow with oil exports can be cited as an example of this type of growth.

Innovation-Based Growth: This growth model is based on developing new technologies, products, or services. Innovation creates new jobs and accelerates EG.

Capital Intensity: This type of growth is a growth model based on capital from the factors of production. Capital intensity can accelerate EG through high-tech manufacturing, construction, and similar investments.

International Trade-Driven Growth: This growth occurs by increasing the country's exports. The international trade-oriented growth model increases the country's foreign trade (FT) volume and can trigger EG.

FT is essential for EG and dramatically influences countries' economic policies. FT increases production diversity, benefits from economies of scale, and facilitates access to foreign markets. It also increases competition and encourages technological transfer.

Export (EXPT) and import (IMPT) activities can stimulate EG, and therefore countries often develop policies to support EXPTs and IMPTs. Exporting means that a country sells its goods and services to foreign markets. The positive impact of EXPTs on EG can take several forms. First, EXPT revenue increases the country's national income and supports employment. Second, EXPTs can increase the competitiveness of local businesses, increasing their productivity and efficiency. Third, EXPTs can trigger production and investment activities with increased foreign demand. When these factors come together, EXPTs seem to stimulate EG. IMPT means that a country brings foreign goods and services to local markets. The impact of IMPTs on EG occurs in many ways, such as meeting local consumer demand and providing the necessary intermediate goods and raw materials in production processes. IMPTs can increase living standards by offering local consumers a more comprehensive range of products and can make local producers more efficient by encouraging competition. In addition, IMPTs can support local production by providing intermediate goods and raw materials to be used by local enterprises in their production processes. For these reasons, the effect of FT on EG is essential. Countries can follow policies to increase EG by encouraging EXPTs and IMPTs.

The importance of FT for the world economy is an indisputable issue for countries. The volume of global trade has expanded enormously in recent years. The growth of FT also affects the growth of the world economy. FT can contribute to EG by increasing the demand for a country's goods and services in international markets. It can increase production and sales, creating employment opportunities and stimulating EG.

Additionally, FT can provide access to new technologies, capital, and raw materials that can help increase productivity and efficiency in local industries. On the other hand, FT can also challenge EG. If a country becomes too dependent on EXPTs, global demand or pricing changes can significantly impact its economy. Similarly, if a country IMPTs more than it EXPTs, it can create a trade deficit that can negatively affect the economy. The relationship between EG and FT is complex and multifaceted. A country's ability to effectively manage its FT relations and balance its IMPTs and EXPTs can be critical in determining its EG trajectory.

EG is defined as the increase in the production volume of an economy over periods. One of the most important indicators of

the increase in the production volume of a country is the changes in the GDP (Turan, 2008). Components of GDP can be mentioned, and the components of GDP are:

$$GDP = C + I + G + (X - M) \quad (1)$$

Consumption (C): Consumption of households

Investment (I): Investments in enterprises

Government expenditures (G): Government expenditures for goods and services

Export (X): The sum of goods and services sold by a country to other countries.

Imports (M): The sum of goods and services bought by a country from other countries.

These components are used in calculating GDP and represent different aspects of economic activity. For example, consumption represents the household aspect of economic activity, while investment; represents the aspect of economic activity done by businesses. EXPT and IMPT, on the other hand, represent trade activities between countries. Therefore, the impact of EXPTs and IMPTs on EG is essential in analyzing issues such as FT deficit or surplus. An increase in EXPTs can lead to an increase in output and indirectly to an increase in GDP.

On the other hand, when IMPTs increase, the costs of inputs used in production increase, resulting in a decrease in GDP. For this reason, the importance of EXPT and IMPT components in GDP is frequently discussed in macroeconomic analyses of national economies. Due to the importance of FT on the economy, researchers must examine it with different methods, examples, and periods.

For this purpose, in this study, the relations between EG and FT indicators were analyzed using the G-20 countries' data from 1997 to 2021. This study is essential in determining the contribution of FT to the country's economy and the numerical value of this contribution. In particular, Turkey's economic policy at the beginning of 2023 is based on the depreciation of the local currency against foreign currencies, the record-breaking of EXPTs, and the closing of the FT deficit. In this respect, this study is also crucial in contributing to the literature and the sector by examining the relationship between FT and EG. This research purposes to define the importance of EXPTs and IMPTs in national economies.

The study universe covers all countries with EXPT and IMPT variables in the EG equation. This wide-ranging universe allows the study results to be more general and far-reaching. However, limitations such as the fact that the study population is so large, some complications in the data collection manner, and the lack of data may be encountered. Therefore, it is crucial to carefully interpret and generalize the methods and results used in the study.

The study sample is the G-20 countries, which have an essential place in the world economy and represent great economic powers. These countries carry out a large part of world trade, and these countries take place in the platforms where many international economic decisions are made. In addition, there are different levels of development and economic structures among the G-20 countries. It can help the study results provide a broader perspective and increase the likelihood that the conclusions drawn will also apply to other countries. However, selecting G-20 countries may exclude some small but economically significant countries. Therefore, the study's results may only be valid for G-20 countries, and different results may be obtained for other countries.

In the study, the growth, EXPT, and IMPT figures of the G-20 countries for the last 25 years were taken. Co-integration tests were used to analyze the long-term relationship between the variables. In addition, Wald Tests were used to examine the short-run relationship. Causality tests were used to analyze the relationship among series.

The limitations of the study are the examining the relationship between EG and FT may be:

Lack of data: Most countries do not have EG and FT data. Therefore, the results of some studies may not be reliable.

Data mismatch: Because different countries use different data collection methods at different time intervals, there may be inconsistencies between EG and FT data. It may affect the reliability of the results of the studies.

Short-term effects: The relationship between EG and FT may be variable in the short run. Therefore, using long-term data is essential to counteract the impact of short-term fluctuations.

Causality problem: It may be thought that there is a causal relationship between EG and FT, but it may not be easy to verify this relationship. The influence of other factors should also be taken into account.

Exchange rate and price fluctuations: The relationship between EG and FT can be affected by the exchange rate and price fluctuations. The influence of these factors should also be taken into account during studies.

This research is divided into five parts. The first part is the introductory part. In the second part, studies in the literature are mentioned. The data and methodology are mentioned in the third part. The findings obtained from the research tests are mentioned in the fourth part. In the last part, the results and discussions about the research are shared.

2. LITERATURE REVIEW

In local studies in the literature, the effect of FT on EG has been analyzed with different econometric methods.

Öztürk (2006) used the descriptive analysis method with the data between 1978 and 2005 in his study. In the author's study, the International Energy Agency made predictions about the increase in oil prices. According to this forecast, oil prices are expected to increase by 50% until 2030. According to this study, Öztürk emphasizes the importance of the resumption of FT. Bahar (2006) conducted a study using the Co-integration Test and the VAR Model between 1963 and 2004. According to the findings obtained from this study, it has been determined that tourism positively affects EG. According to the co-integration test results of the study, it is claimed that there is a positive causality relationship between EG and tourism development. Yapraklı (2007) analyzed the Co-integration Test, Granger Causality test, and Vector Error Correction models between 1990 and 2006. As a result, it has been concluded that financial openness in Turkey eliminates the positive effects of trade openness on EG and that the economy is based on money production rather than on producing goods and services. As a result, it shows that the economic structure in Turkey has a growth focused on domestic demand and monetary policy rather than growing outwardly. The study highlights an important issue related to Turkey's EG strategy and policies. In addition, this research indicates that the positive contributions of financial and trade openness to growth are limited, and the economy is more dependent on monetary policy. Turkey needs to focus more on production-based policies to sustain EG. In his study, Yapar Saçık (2009) reveals the relationship between EG and FT, the internal growth model, which is the newest of growth theories, for the period 1980-2006. While this model shows that FT is a means of growth, it states that human capital is also accepted as a source of growth, like physical capital and FT, and emphasizes the importance of the endogenous growth model. The model draws attention to the necessity of human capital investments and FT for EG. It shows that investment in people (education, health) in an economy can increase EG, and FT can also be a growth-supporting factor. In addition, the author emphasizes the significance of FT and human capital investments in Turkey's development strategies and policies. According to the analysis results of the study, promoting FT for EG and increasing investments in human resources can help Turkey reach its sustainable growth and development goals (Yapar Saçık, 2019). Ekinci (2011) summarizes the results of a study conducted for 30 years between 1980 and 2010. The methods used in the research are the ADF unit root test, co-integration analysis, error correction model, and Granger causality test. According to the results, a long-term relationship was found between foreign direct investments and EG. It means that increased foreign direct investment has stimulated EG. In addition, it shows that foreign investments contribute to EG. On the other hand, no relationship could be found between foreign direct investments and employment. It shows that foreign investments have no direct effect on employment. Göçer (2013) summarizes the results of a study conducted using Panel Data Analysis for 16 years between 1996 and 2012. The research includes 11 Asian countries, such as China, S. Korea, Azerbaijan, India, Kazakhstan, Malaysia, Russia, Pakistan, Singapore, Thailand, and Turkey. According to the results, it was determined that a 1% increase in R&D expenditures increased EXPTs of high-technology products by 6.5%, EXPTs of information and communication technologies by 0.6%, and EG by 0.43%. These data indicate that R&D spending has a beneficial impact on economic performance and EXPTs in these nations. The increase in high-tech product EXPTs reflects these countries' competitiveness and technological capabilities. With the increase in R&D expenditures, these countries are seen to gain more competitive advantage in high-tech products and increase their EXPTs. The increase in the EXPTs of information and communication technologies shows that R&D expenditures encourage technological innovations and provide a competitive advantage in this field. As a result of the study, the author concluded that the countries covered in the research realized more EXPTs in the information communication technologies sector and supported the growth in this field. Finally, the impact on EG is also noteworthy. It was found that the increase in R&D expenditures increased EG by 0.43%. It shows that R&D activities play a role in increasing EG potential. Çelik and Direkci (2013) summarize the results of a study conducted in Turkey from 1991-2010. The author's study used the ADF test for co-integration and causality analysis. According to the results, it has been determined that foreign debt in Turkey harms EG. It means the external debt increase negatively affected Turkey's EG performance. The co-integration analysis shows a long-run relationship between external debt and EG. In other words, it has been concluded that foreign debt negatively affects EG in the long run. The causality analysis, on the other hand, shows that there is a relationship that external debt affects EG. This result shows that the increase in external debt reduces EG. Mercan et al. (2013), co-integration and boundary test analysis were performed using Turkish Central Bank data. This study summarizes the results of a study conducted in Turkey. In the study, Pesaran et al. (2001) analysis was carried out with the boundary test approach he developed. According to the study's findings, co-integration was detected between the variables. It means a long-term relationship exists between financial growth and EG. As a result of their studies, the authors concluded that this relationship was positive and statistically significant. This result shows that financial development encourages EG. The development in the financial sector can be associated with the accumulation of capital, increased investments, and the general improvement of economic activity. These findings are based on a study using Central Bank data. However, it should be noted that the interaction of other factors and different periods are not considered. The complexity of the relationship between financial development and EG may require broader analysis and research. As a result, it is supported by the study's findings that financial development has a positive and statistically significant effect on EG. These results show that the focus of economic policies on the development of the

financial sector can stimulate EG. Vergil and Sinay (2013) summarize the results of a study covering 1989-2009 to understand the effect of knowledge transfers through FT on EG in Turkey. Johansen Co-integration Test and VAR (Vector Auto Regression) methods were used in the study. The Johansen Co-integration Test is a method used to analyze the long-term relationship among data series. At the same time, VAR analysis is a method used to examine the dynamic relationship between variables. According to the study's findings, the effect of knowledge transfers through FT on EG has been determined. However, the statement did not include more specific information about the direction and dimensions of the impact. These results were obtained through analyzes made in Turkey. As a result, this study investigated the effect of knowledge transfers through FT in Turkey on EG and found a general effect. In addition, the following studies by foreign researchers found a positive relationship between EG and FT.

Edwards et al. (1998) discussed the effects of FT on EG and showed that economic openness increases productivity and growth. Frankel et al. (1999) found that FT positively affects EG. Rodriguez et al. (2000) analyzed the effect of FT on EG and trade policies on EG, as well. Dollar et al. (2004) revealed a positive relationship among FT, EG and poverty reduction. Li et al. (2005) examined the effect of China's membership in the World Trade Organization (WTO) on EG and found that FT supports growth.

3. DATA AND METHODOLOGY

3.1. Data

G-20 consists of Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, South Korea, Mexico, Russia, Saudi Arabia, South Africa, Turkey, the United Kingdom, and the United States, and the European Union (EU). The E.U. is included in the G-20 not as a country but as a community.

The G-20 comprises countries that come together for global economic cooperation and decision-making. The G-20 (Group of Twenty) is an international organization of the world's largest economies. Member countries represent approximately 90% of the world economy and approximately 80% of the world's population. Two-thirds of the world's population lives in these countries.

Table 1: Variables Used in the Study

Variable	Symbol	Source
Economic Growth	GDP	World Bank
Import	IMPT	World Bank
Export	EXPT	World Bank

The variables and symbols in Table 1 are the sources of the World Bank.

The variables of the research are as follows:

Growth: GDP (Gross Domestic Product) representing EG

Imports: The sum of goods and services that a country purchases from other countries

Export: The sum of goods and services sold by a country to buyers in other countries

The data consists of 25 years between 1997 and 2021 from 19 countries within the G-20 organization. Annual data were used in the study. After obtaining the raw data in the study, logarithmic transformations were made.

The EG variable represents GDP. While the IMPT variable expresses the total of goods and services entering the country, the EXPT variable expresses the sum of the goods and services leaving the country.

3.2. Method

Equation (2) is applied to define the model's validity in the research.

$$GDP = f(IMPT, EXPT) \quad (2)$$

In equation (2), GDP shows the growth in the country's economies, IMPT shows the growth in EXPTs, and EXP shows the growth in EXPTs. GDP is defined as the dependent variable in this equation. In addition, IMPT and EXPT are defined as independent variables in this equation.

The logarithm of all variables has been taken.

$$\ln GDP = \alpha + \beta_1 \ln IMPT + \beta_2 \ln EXP + \varepsilon_{it} \quad (3)$$

in this equation, the constants α and ε are defined as error terms. A 5-step approach is used to estimate the equation (3).

In the first step, cross-sectional dependence (CD) between variables needs to be verified before analyzing the presence of

co-integration between variables. For this purpose, B.-P. LM, P. Scale L.M. and P. CD tests were used.

If there is cross-dependence between data sets, second-generation unit root tests should be chosen. For this, CIPS and CADF analysis were applied. In order to apply co-integration tests, all variables must be stationary at the same level ($I(0)$ or $I(1)$).

In the third step, co-integration tests are applied to identify the existence of a long-term equilibrium link between the series. For panel co-integration analyses, Pedroni (1999), Johansen-Fisher (Maddala et al., 1999) and Kao (1999) co-integration tests, which are frequently employed in the literature, are preferred.

In the fourth step, DOLS test was implied to define the long-term coefficients of the series. DOLS outperforms FMOLS in terms of performance (Kao et al., 2001).

$$\ln E_t = \beta_{0i} + \beta_{1i} \ln BS_{it} + \beta_{2i} \ln WOB_{it} + \sum_{k=-K_i}^{K_i} \delta_k \Delta \ln BS_{it-k} + \sum_{k=-K_i}^{K_i} \delta_k \Delta \ln WOB_{it-k} + \varepsilon_{it} \quad (4)$$

The endogenous feedback effect is regulated by $\hat{\beta}_{D,i}^*$. Equation (4) displays how it is explained. K_i and $-K_i$ present leading and lagging ranks in equation (4).

$$\hat{\beta}_{GD}^* = N^{-1} \sum_{i=1}^N \hat{\beta}_{D,i}^* \quad (5)$$

The panel DOLS estimator might be determined as Equation (5).

$$t_{\hat{\beta}_{GD}^*} = N^{-1/2} \sum_{i=1}^N t_{\hat{\beta}_{D,i}^*} \quad (6)$$

$\hat{\beta}_{D,i}^*$ indicates the traditional DOLS estimator and represents the i th member in equation (6).

$$t_{\hat{\beta}_{GD}^*} = N^{-1/2} \sum_{i=1}^N t_{\hat{\beta}_{D,i}^*} \quad (7)$$

As a result, equation (7) may be used to represent the equivalent t-ratio.

Finally, the corresponding t-ratio can be explained by equation (7).

In the fifth step, Vector Error Correction Model (V.E.C.M.) was applied to analyze the robustness of the DOLS test results. The long-term co-integration relationship between the series can be explained by the error correction term (ECT_{t-1}) coefficient of VECM (Özparlak et al., 2023). If ECT_{t-1} has a statistically significant negative coefficient, it can be said that there is a constant and long-term relationship among the variables (Ampofo et al., 2021).

In addition, causality relationships between the variables in the research equation were analyzed with Wald Tests. The Wald test determined short-term causality according to whether each lag of the study's variables was significant.

4. FINDINGS AND DISCUSSIONS

4.1. Trend Analysis

Figure 1 shows the fluctuations of average IMP, EXPT, and GDP values between 1997 and 2021. The graph shows sharp decreases were experienced in IMP, EXPT, and GDP values due to the economic crises and epidemics in 2009 and 2020. In general, changes in average import (IMPT), export (EXPT), and EG (GDP) values among G-20 countries show how dynamic the economic activities and trade between countries are. Increasing these values is usually a positive sign of EG because more goods and services are produced and consumed. However, a sustainable EG strategy is required for this growth to be permanent and lead to economic development. Evaluating the sustainable development performances of the G-20 countries is a current issue for the world (Özparlak, 2021b). EG strategies may vary depending on countries' domestic and international trade and investment policies. It is the main factor causing the decrease in the IMP, EXPT, and GDP values of the G-20 countries in the 2020-2021 period. The pandemic has caused a worldwide decline in demand, and the economic activities of many countries, including their trade and tourism sectors, have been severely affected. Therefore, the IMPT and EXPT values of the countries decreased, and thus, the GDP decreased. In addition, the quarantine measures implemented due to the epidemic caused the limitation of production activities and led to a decline in economic activities. It caused a decrease in the IMP, EXPT, and GDP values of the G-20 countries. However, many countries took economic stimulus measures to contain the epidemic and made efforts to revive economic activity. Therefore, as of the end of 2021, some countries started to see a recovery in IMP, EXPT, and GDP values.

Figure 1: Average IMPT, EXPT, and GDP Values of G-20 Countries between 1997 and 2021



4.2. Descriptive Statistics and Correlation Analysis

Table 2 includes the descriptive statistics of the data of the study.

Table 2: Descriptive Statistics

	<i>lnGDP</i>	<i>lnIMPT</i>	<i>lnEXPT</i>
Mean	-0.81	-0.27	-0.46
Median	-0.8	-0.26	-0.45
Max	-0.56	-0.04	-0.23
Min	-3.14	-2.85	-3.02
Stand. Dev.	0.16	0.15	0.15
Skewness	-7.08	-11.24	-10.67
Kurtosis	91.98	189.28	177.38
Jarque-Bera	160665.8	696765.2	610836.9
Prob.	0.0000	0.0000	0.0000
Total	-385.15	-130.12	-216.39
Tot. Stand. Dev.	12.59	10.57	10.80
Number of Obs.	475	475	475

Table 3 demonstrates the correlation relationship between the variables in the study. Accordingly, a positive, moderately statistically significant correlation exists between *lnGDP* and *lnIMPT*. In addition, there is a positive, weak-grade statistically significant relationship between *lnGDP* and *lnEXPT*. In addition, there is a positive, moderate, and statistically significant relationship between *lnIMPT* and *lnEXPT*. Correlation test findings are consistent with previous research.

Table 3: Correlation Table

	<i>lnGDP</i>	<i>lnIMPT</i>	<i>lnEXPT</i>
<i>lnGDP</i>	1		
<i>lnIMPT</i>	.48***	1	
<i>lnEXPT</i>	.26***	.40***	1

Note: ***, **, and * denotes significance level of 1%, 5% and 10% respectively.

4.3. Breusch Pagan Lagrange Multiplier Test (LOAD-POP)

Table 4 displays the results of the B.-P. LM, P.Scale L.M. & P. CD tests. This test will support the acceptance of the existence of cross-sectional dependence between the series. As shown in Table 4, all tests accept the existence of CD among the variables.

Table 4: Cross-Sectional Dependence Tests

Test	Stat.	d.f.
B.-P. LM	1081.68	0.000
P. Scaled LM	49.24	171
P. CD	27.76	0.000

Note: ***, **, and * denotes significance level of 1%, 5% and 10% respectively.

4.4. Unit Root Tests

The results of CIPS and CADF second generation unit root tests are given in Table 5. In order to apply co-integration analysis, the variables should be stationary at either the $I(0)$ or $I(1)$ level. According to the unit root test results of the research, all variables are stationary at $I(0)$ or $I(1)$ level.

Table 5: Unit Root Tests

	CIPS		CADF	
	Level	Δ	Level	Δ
\ln GDP	-5.69 ***	-6.96 ***	-1.63	-3.11 ***
\ln IMPT	-3.60 ***	-5.41 ***	-6.44 ***	-4.83 ***
\ln EXPT	-3.57 ***	-5.09 ***	-6.35 ***	-5.82 ***

Note: ***, **, and * denotes significance level of 1%, 5% and 10% respectively.

4.5. Co-integration Tests

Co-integration refers to situations where the behavior of two or more related time series depends on each other, but they cannot be considered random walking alone. Co-integration tests are used to detect and analyze the existence of such relationships.

4.5.1. Pedroni Co-integration Test

In Table 6, the results obtained from the Pedroni co-integration test are shared.

Table 6: Pedroni Co-integration Test Results

	Stat.	Prob.	Weight Stat.	Prob.
Panel v- Statistic	-2.76741	0.9972	-2.19493	0.9859
Panel rho- Statistic	-6.89256	0.0000	-7.55589	0.0000***
Panel PP- Statistic	-9.52775	0.0000	-12.2364	0.0000***
Panel ADF- Statistic	-9.39894	0.0000	-11.3304	0.0000***
	Stat.	Prob.		
Group rho-Statistic	-7.13476	0.0000***		
Group PP- Statistic	-15.9642	0.0000***		
Group ADF- Statistic	-13.8785	0.0000***		

Note: ***, **, and * denotes significance level of 1%, 5% and 10% respectively. Trend assumption: linear deterministic trend. User-defined lag length: 1

All of the panel and group tests are significant at the 1% level, with the exception of Panel v-Statistic. Overall, the table shows that six of the seven tests included in this test confirm the existence of a co-integration link between the variables. These results rejected the H_0 hypothesis (H_0 : There is no co-integration between the variables).

4.5.2. Johansen-Fisher Panel Co-integration Test

The results of the Johansen Fisher panel cointegration test are shown in Table 7. The results in Table 7 confirm the existence of a cointegration relationship between the series. Hence, the null hypothesis H_0 is rejected (H_0 : There is no cointegration between the variables).

Table 7: Johansen-Fisher Panel Co-integration Test Results

Hypothesized	Fisher Statics* (from trace test)		Fisher Statistic* (from max-eigen test)	
No. of C.E. (s)	Prob.		Prob.	
$r \leq 0$	231.5	0.000 ***	171.9	0.000 ***

$r \leq 1$	115	0.000 ***	80.77	0.000 ***
$r \leq 2$	103.3	0.000 ***	103.3	0.000 ***

Note: ***, **, and * denotes significance level of 1%, 5% and 10% respectively.

4.5.3. Kao Co-integration Test

The results in Table 8 figure out that there is co-integration between the variables. Therefore, the null hypothesis H_0 (H_0 : There is no co-integration between variables) is rejected.

Table 8: Kao Co-integration Test

	t-Statistic	Prob.
A.D.F.	-3.33	0.0004***
Resd. Var.	0.04	
HAC Var.	0.00	

Note: ***, **, and * denotes significance level of 1%, 5% and 10% respectively.

4.6. DOLS Test

The findings obtained from the DOLS analysis are given in Table 9. The findings from the DOLS test are consistent and statistically significant. The test results displayed that a 1% increase in IMPT implies an approximately 0.45% increase in a country's GDP score. Similarly, a 1% increase in EXPT is explained by an approximately 0.52% increase in a country's GDP score. Moreover, the results of the test are consistent with previous studies in the literature (Frankel et al., 1999; Rodriguez et al., 2000; Dollar et al., 2004; Li et al., 2005; Edwards, 1998).

Table 9: DOLS Co-integration Test Results

Panel DOLS	Coeff.	Std. Er.	t-stat.	Prob.
\ln IMPT	0.446693	0.059073	7.561692	0.0000 ***
\ln EXPT	0.516095	0.095561	5.400687	0.0000 ***

Note: ***, **, and * denotes significance level of 1%, 5% and 10% respectively.

4.7. V.E.C.M. Test

According to the results in Table 10, ECT_{t-1}^1 is equal to "-0.04879". This value is negative and statistically significant. The robustness test results of the study confirmed the co-integration between the variables. Therefore, it is possible to state there is a long-term causality from the \ln IMPT and \ln EXPT variables. According to these results, the \ln IMPT and \ln EXPT variables affect the \ln GDP variable.

Table 10: V.E.C.M. Test Results

	Coeff.	Std. Er.	t-stat.	Prob.
C(I)	-0.04879	0.0073	-6.6430	0.0000
C(II)	-0.54789	0.0551	-9.9513	0.0000
C(III)	-0.19050	0.0628	-3.0311	0.0026
C(IV)	-0.05555	0.0426	-1.3053	0.1925
C(V)	-0.07947	0.0441	-1.8009	0.0725
C(VI)	0.19517	0.0744	2.6245	0.0090
C(VII)	0.03068	0.0449	0.6833	0.4948
C(VIII)	-0.00004	0.0064	-0.0056	0.9956

Note: ***, **, and * denotes significance level of 1%, 5% and 10% respectively. The optimum delay length selection according to AIC, L.R., FPE, SC, and H.Q. criteria is 8 delays.

¹ C(I)

4.8. WALD Test

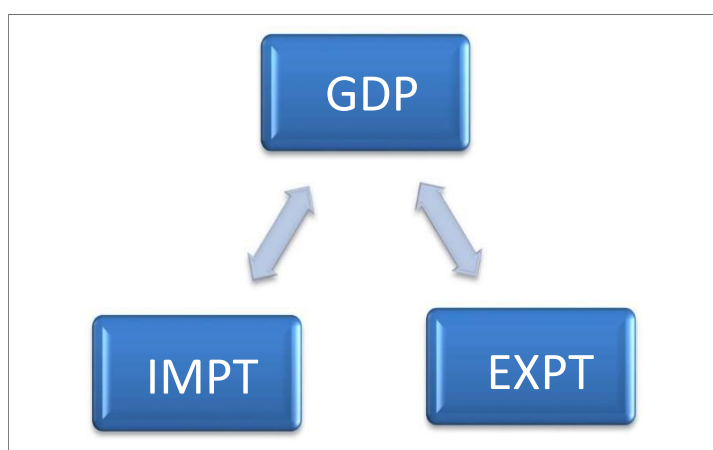
The short-term causality relationship between the series was analyzed with the Wald Test. According to the results in Table 11, it can be said that there is no significant bilateral causality relationship between $\ln\text{IMPT}$ and $\ln\text{GDP}$ in the short term. In addition, it is claimed that there is no significant causal link between $\ln\text{EXPT}$ and $\ln\text{GDP}$. However, there is no significant relationship between $\ln\text{EXPT}$ and $\ln\text{IMPT}$ in the short term.

Table 11: WALD Test Results

Null Hypothesis	Observation	Value	Prob.
$\ln\text{IMPT} \rightarrow \ln\text{GDP}$	437	5.89267***	0.003
$\ln\text{GDP} \rightarrow \ln\text{IMPT}$		11.6445***	0.000
$\ln\text{EXPT} \rightarrow \ln\text{GDP}$	437	3.96599**	0.020
$\ln\text{GDP} \rightarrow \ln\text{EXPT}$		98.4847***	0.000
$\ln\text{EXPT} \rightarrow \ln\text{IMPT}$	437	0.64149	0.527
$\ln\text{IMPT} \rightarrow \ln\text{EXPT}$		0.89167	0.411

Note: ***, **, and * denotes significance level of 1%, 5% and 10% respectively.

Figure 2: Causality Established According to Wald Test Results



As seen in Figure 2, the growth in GDP in the short run causes EXPT and IMPT to grow as well. However, in the short run, the growth in IMPT and EXPT causes GDP to grow.

5. CONCLUSION AND IMPLICATIONS

The relationship between EG and FT is a subject that researchers, economists, and politicians have been working on for many years. FT refers to the trade goods and services between countries, while EG refers to the increase in a country's economic activities. Many factors influence the relationship between these two concepts. The contribution of FT to EG has an essential role in the economic development of countries. In particular, increased EXPTs and IMPTs can significantly contribute to countries' EG. In addition, thanks to FT, countries can also benefit from other countries' technological and innovative developments. It can be beneficial for countries' economic development. The relationship between EG and FT is also influenced by factors such as trade policies between countries and international trade agreements. In particular, free trade agreements can increase FT and, thus, EG by removing trade barriers between countries. However, the contribution of FT to EG may not always be positive. In particular, the increase in FT surplus in some countries may cause EXPTs to decrease domestic prices. In this case, the competitiveness of domestic producers may decrease, and EG in the country may slow down. In addition, imbalances in FT may adversely affect EG.

EXPT and IMPT variables are economic indicators that reflect the FT activities of countries. An increase in these variables indicates that a country's EXPTs and IMPTs are increasing, while their decreases indicate that these activities are decreasing. GDP is an indicator that measures the economic size of a country. An increase in this variable indicates that a country's economy is growing and producing more goods and services. In contrast, a decrease indicates that the economy is contracting and producing fewer goods and services. The analysis can be used to identify trends in the economic performance of these countries, and this information can be considered by policymakers and investors in their future decisions.

As a result, the relationship between EG and FT is multifaceted and influenced by many factors. The contribution of FT to EG is also affected by factors such as trade policies between countries and international trade agreements. Therefore, due to the importance of FT on the economy, researchers must examine it with different methods, examples, and periods.

In this context, in this study, an analysis was made with the annual data of the G-20 countries between 1997 and 2021. Co-integration tests were used as a method. The study aims to see the long-term and short-term effects of EXPTs and IMPTs on EG. The study aims to support the contribution of EXPT and IMPT variables to the EG of the country's economies. According to the findings obtained from the study, the effect of EXPTs and IMPTs on EG has been proven. With these results, it has been clearly expressed by co-integration tests that countries can improve their EXPTs and IMPTs and support their EG rates in the long run. Although the net EXPT (Net EXPT=EXPT-IMPT) variable is included in the EG (GDP) equation, the effects of EXPTs and IMPTs, which are complementary to it, on EG are demonstrated by co-integration tests.

In addition, it has been seen that there is a causality relationship between EXPTs and EG and between IMPTs and EG with short-term tests. According to the results, the increase in EXPTs and IMPTs in the short term supports EG. Because the increase in EXPTs causes the country's foreign markets to increase and the demand for production in the country to increase. As a result, the increasing demand at domestic and abroad causes an increase in domestic supply. Thus, countries create more investment, more production, and more employment.

Moreover, from the study's results, it has been concluded that the increase in EG values in the short run also causes an increase in EXPTs and IMPTs. The increase in EG can explain because of increases in the volume of supply and demand. As economies grow, they create more production, investment, and employment. It is just that the production capacities and productivity of the countries are also developing more. It means that only the economies of developing countries can reach the capacity to EXPT and IMPT more.

These results clearly indicate the importance of FT for national economies. In this direction, it is of great importance for policymakers to increase the country's FT volume to increase their countries' welfare. In addition, this study can be done with more countries and different methods over a more extended period. In this way, it can be ensured that the information obtained from the research results is more inclusive and valid.

REFERENCES

- Ampofo, G.M. K., Jinhua, C., Bosah, P. C., Ayimadu, E.T. & Senadzo, P. (2021). Nexus between total natural resource rents and public debt in resource-rich countries: A panel data analysis. *Resources Policy*, 74, 102276.
- Bahar, O. (2006). Turizm sektörünün Türkiye'nin ekonomik büyümesi üzerinde etkisi: VAR analizi yaklaşımı. *Yönetim ve Ekonomi*, 13(2), 138- 150.
- Çelik, S. & Başkonuş Direkci, T., (2013). Türkiye'de 2001 krizi öncesi ve sonrası dönemler için dış borç ekonomik büyüme ilişkisi (1991-2010). *Gaziantep Üniversitesi İktisadi ve İdari Bilimler Fakültesi*, 8(3), 111-135.
- Dollar, D. & Kraay, A. (2004). Trade, growth, and poverty. *The Economic Journal*, 114(493), 22-49.
- Edwards, S. (1998). Openness, productivity, and growth: what do we really know? *The Economic Journal*, 108(447), 383-398.
- Ekinci, A. (2011). Doğrudan yabancı yatırımların ekonomik büyüme ve istihdama etkisi: Türkiye uygulaması (1980-2010). *Eskişehir Osmangazi Üniversitesi İİBF Dergisi*, 6(2), 71-96.
- Frankel, J.A. & Romer, D. H. (1999). Does trade cause growth? *American Economic Review*, 89(3), 379-399.
- Göçer, İ. (2013). Ekonomik büyümenin belirleyicisi olarak ihracat: Gelişmekte olan Asya ülkeleri için yatay kesit bağımlılığı altında çoklu yapısal kırılmalı paneleştürme analizi. *Bankacılar Dergisi*, 86, 27-42.
- Kao, C. (1999). Spurious regression and residual-based tests for co-integration in panel data. *Journal of Econometrics*, 90(1), 1–44.
- Kao, C. & Chiang, M. H. (2001). On the estimation and inference of a cointegrated regression in panel data, Baltagi, BH, Fomby, TB ve Carter Hill, R. (Ed.) *Nonstationary Panels, Panel Co-integration, and Dynamic Panels, Advances in Econometrics*, b(15), Emerald Group Publishing Limited, Bingley, 179-222.
- Kırçecek, T. (2023). The Relationship Between Economic Growth and Foreign Trade [Published master's thesis]. Istanbul Beykent University.
- Li, X., Liu, X., Parker, D., & Yao, X. (2005). The impact of China's WTO accession on its regional economies: a general equilibrium analysis. *World Economy*, 28(7), 893-922.
- Maddala, G.S. & Wu, S. (1999). A comparative study of unit root tests with panel data and a new simple test. *Oxford Bulletin of Economics and Statistics*, 61, 631- 652.
- Mercan, M. & Peker, O., (2013). Finansal gelişmenin ekonomik büyümeye etkisi: ekonometrik bir analiz. *Eskişehir Osmangazi Üniversitesi İİBF Dergisi*, 8(1), 93-120.
- Özparlak, G. & Gürol, B. (2023). The role of diversity on the environmental performance and transparency. *Environment, Development and Sustainability*, <https://doi.org/10.1007/s10668-023-04193-x>

- Özparlak, G. & Yeşilyurt, S. (2021a). Ülkelerin kredi temerrüt takası (CDS) primlerinin dinamik nedensellik ilişkisi ile incelenmesi. *Finans Politik & Ekonomik Yorumlar*, 656 (58), 89-114.
- Özparlak, G. (2021b). G-20 ülkelerinin sürdürülebilir kalkınma performanslarının değerlendirilmesi. *International Istanbul Economic Research Conference (IIERC)*, 18-20 November 2021, Istanbul University, Istanbul, Turkey.
- Özparlak, G. (2022). *Finans 4.0*, Nobel Yayınevi: Ankara.
- Öztürk, N., (2006). Türkiye’de sınır ticaretinin gelişimi, ekonomik etkileri, karşılaşılan sorunlar ve çözüm önerileri. *ZKÜ Sosyal Bilimler Dergisi*, 2(3), 107-127.
- Pedroni, P. (1999). Critical values for co-integration tests in heterogeneous panels with multiple regressors. *Oxford Bulletin of Economics and Statistics*, 61, 653-670.
- Pesaran, M.H., Shin, Y. & Smith, R.J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16(1), 289–326.
- Rodriguez, F. & Rodrik, D. (2000). Trade policy and economic growth: a skeptic's guide to the cross-national evidence. *NBER Macroeconomics Annual*, 15, 261-325.
- Sevcin, G. & Tuğba, A. (2019). Yüksek teknoloji ürün ihracatı: lider ülkeler ve Türkiye Analizi. *Sosyoekonomi Dergisi*, 27(40), 11.
- Turan, T. (2008). *İktisadi büyüme teorisine giriş*, İstanbul, Yalın Yayıncılık.
- Vergil, H. & Sinay, M., (2013). Dış ticaret ve büyüme ilişkisinin bilgi transferleri yönünden incelenmesi: Türkiye örneği. *Business and Economics Research Journal*, 4(1), 59-76.
- Yapar Saçık, S. (2009). Dış ticaret politikası ve büyüme ilişkisi: teorik açıdan bir inceleme. *Karamanoğlu Mehmetbey Üniversitesi İİBF Dergisi*, 11, 162-171.
- Yapraklı, S. (2007). İhracat ile ekonomik büyüme arasındaki nedensellik: Türkiye üzerine ekonometrik bir analiz. *ODTÜ Gelişme Dergisi*, 34, 97-112.

THE TRIPLE HELIX: OIL PRICES, TRADE TERMS AND UNEMPLOYMENT: A DEVELOPMENTAL ANALYSIS OF TURKIYE

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ABSTRACT

Purpose- This study delves into the intricate dynamics surrounding oil prices, terms of trade, and unemployment, pivotal factors exerting profound effects on the developmental trajectories of developing countries.

Methodology- Employing the Vector Autoregressive Model and Granger Causality Test, the research scrutinizes data spanning from 1980 to 2021, with a focus on Turkey as a case study. Granger causality analysis reveals bidirectional causality between terms of trade and unemployment as well as between oil prices and unemployment.

Findings The findings underscore the significance of targeted policies to address challenges in developing nations. Strategies aimed at reducing energy dependence, diversifying energy sources, and implementing strategic foreign trade planning emerge as crucial components to steer these countries toward sustainable development. Furthermore, the study advocates for the implementation of employment policies to effectively tackle unemployment rates.

Conclusion- The reciprocal relationships observed between these variables highlight the need for comprehensive and multifaceted approaches to address the intricate interplay of economic factors influencing the developmental processes of developing countries. The insights gleaned from this research not only contribute to a nuanced understanding of these relationships but also provide a foundation for informed policy recommendations to promote robust and sustainable development in developing nations.

Keywords: Oil, terms of trade, unemployment, vector auto regressive model, Granger Causality

JEL Codes: O13, O11, Q43, E24, F14, F43, C32.

1. INTRODUCTION

For nations on the path to progress, development holds the key to enhancing the quality of life by reshaping their economic, social, and institutional foundations. It's a transformative journey that empowers countries to reach milestones like economic growth, poverty alleviation, improved access to education and healthcare, strategic infrastructure investments, and sustainable development. Hence, for developing countries, the pursuit of development is pivotal to enhancing both their economic prosperity and societal well-being. In this pursuit, the fluctuation of oil prices emerges as a critical factor influencing the trajectory of developing nations. Oil, a crucial resource, serves as the lifeblood for many countries, catering to their energy requirements. A surge in oil prices can escalate the import costs for developing nations, potentially casting a shadow on their economic advancement. Conversely, a dip in oil prices can alleviate the import burdens, offering a boon to the economic growth of these nations. However, it's essential to note that the repercussions of such shifts in oil prices on the development journey may vary, contingent on factors like a country's reliance on oil imports and exports.

Given that developing nations rely more heavily on foreign economic ties than their developed counterparts, the terms of trade play a crucial role in shaping their economic landscapes. These countries find themselves compelled to import capital goods and raw materials essential for their developmental pursuits. When the terms of trade take an unfavorable turn, it diminishes a nation's import capacity. Conversely, a positive shift in these terms can infuse additional resources, potentially accelerating the pace of economic development. The intricate dance between development and unemployment underscores a profound connection. Unemployment wields the potential to cast a shadow on a country's economic progress. In regions grappling with high unemployment rates, the path to economic growth and development becomes notably challenging. The ripple effect is profound; elevated unemployment rates can curtail a country's production capacity, exerting a dampening effect on overall economic growth. Furthermore, in nations marked by high unemployment, poverty rates often soar, exerting an additional adverse impact on their developmental trajectory. Consequently, the imperative of reducing unemployment rates emerges as a linchpin in fostering the economic development of a nation.

In the present day, delving into the intricate web of economic dynamics, particularly unraveling the intricate connections among pivotal variables like oil prices, foreign trade, and unemployment, stands as a paramount undertaking for economists and policymakers alike. Grasping the nuances of how oil prices, with their reverberating effects on development and growth, and the influence of foreign trade on unemployment, holds immense significance in steering economic decisions. The sway of oil prices, as a key player in the energy market, holds sway over economic performance, adding layers of complexity to the decision-making landscape. Simultaneously, the growing significance of foreign trade's impact on unemployment is particularly noteworthy within the broader canvas of the global economy. In this study, our aim is to navigate the intricacies that bind oil prices, foreign trade, and unemployment, seeking a deeper understanding of their interconnected nature.

Research has shown that oil price shocks can have a significant impact on unemployment rates, especially in times of financial distress (Adeosun et al., 2023). Positive oil price shocks have been found to contribute negatively to employment, while oil price declines have been found to have less impact on employment recovery (Shuddhasattwa Rafiq et al., 2018). In addition, oil price fluctuations have been found to affect unemployment forecasts in the long run, suggesting that oil prices are an important factor in determining employment levels [Ordóñez et al., 2019]. However, more research is needed to explore the relationship between oil prices, foreign trade and unemployment in more detail. Based on this need, these relationships will be analyzed for the period 1980-2021 by taking the case of Turkey. The study will first provide a literature review and then move on to empirical tests. In the last section, inferences will be drawn based on the findings.

2.LITERATURE REVIEW

The complex relationship between oil prices, foreign trade and unemployment has been the focus of many studies to understand and manage the dynamics of economic systems. While oil, as an important component of energy resources, has a direct impact on economies, it also has indirect effects on foreign trade and employment levels. In this context, studies in the literature provide important information on how oil price fluctuations affect trade balances and unemployment rates. In this section, we will review different empirical studies and their findings on the complex relationship between oil prices, foreign trade and unemployment.

2.1. Terms of Trade and Unemployment

Empirical studies have generally indicated that an expansion in international trade reduces a country's overall unemployment rate in the long run [Belenky and Riker, 2015]. However, there are also studies suggesting that trade liberalization policies have a positive impact on unemployment in the long run but have a negative impact in the short run [Hung and Peng, 2019]. It is generally accepted that there is a relationship between trade and unemployment. A study in South Asian countries found that trade openness is positively associated with unemployment along with GDP growth rate and foreign direct investment (FDI) [Nguyen, 2022]. Similarly, it has also been observed that trade openness has a negative and significant impact on the unemployment rate in Nigeria, but provides employment opportunities (Nwosa et al., 2020).

The literature on trade and unemployment also acknowledges the impact of trade liberalization on unemployment by identifying various channels and mechanisms (Nwosa, 2020). It has also been emphasized that the effects of trade liberalization on unemployment can be influenced by factors such as labor search frictions and fair wages [Hung and Peng, 2019]. It has been determined that imports and exports have different effects on the unemployment rate depending on the economic development and industrial structure of each country [Jin et al., 2019]. Therefore, although the impact of foreign trade on unemployment is generally accepted, the nature and direction of this relationship may vary depending on specific factors and contexts.

According to Caligagan (2022), there is a significant relationship between unemployment and trade openness. However, Ersungur et al. (2021) found no significant relationship between the square of imports and exports and unemployment in the long-run perspective. Abugamea (2018) found that foreign trade has no effect on unemployment. According to Cütçü and Cenger (2017),

there is no long-run relationship between imports, exports and unemployment; there is only a relationship from imports to exports.

Studies conducted in developed and developing countries indicate that there is no causal relationship between unemployment and imports and exports. However, Gül and Kamacı (2012) find that there is a causal relationship between imports and exports and unemployment.

According to Gibson (2010)'s analysis, imports reduce employment. Dutt et al. (2009), on the other hand, found the existence of an inverse relationship between openness and unemployment. The different findings in the literature on the relationship between unemployment and foreign trade emphasize that this complex relationship may vary depending on various factors and contexts.

2.2. Oil Prices and Unemployment

There is a relationship between oil prices and unemployment. Research has shown that changes in oil prices can affect the unemployment rate (Ananjeva, 2023). The relationship between oil prices and unemployment is bidirectional, meaning that they affect each other [Adeosun et al., 2023]. However, the impact of oil price changes on unemployment may vary depending on the state of the economy and the level of oil price uncertainty (Raifu et al., 2020). In some cases, an increase in oil prices may worsen the unemployment situation, while a decrease may have a negligible mitigating effect (Bildirici and Sonüstün, 2019). In addition, the response of unemployment to oil shocks may be different in times of financial distress compared to normal periods [Ordóñez et al., 2019]. Overall, these findings suggest that policymakers should consider the relationship between oil prices and unemployment and adopt a nuanced approach to policies aimed at mitigating the negative effects of oil price fluctuations on the labor market.

Regarding the long-term impact of oil price shocks on unemployment, Bjornland's (2000) research supported Fernandez (2011)'s findings by suggesting that oil price fluctuations have no clear relationship with unemployment. Trang et al. (2017) also emphasizes that the effect of oil prices on unemployment is uncertain. On the other hand, Sinan (2018) finds a long-run and bidirectional causality relationship between oil prices and unemployment. Alkhateeb et al. (2017) find that oil prices have a positive effect on the employment rate. According to Senzangakhona (2015), oil prices have an increasing effect on the unemployment rate in the long run, while they have a negative effect in the short run perspective. These various findings emphasize the complexity of the effects of changes in oil prices on unemployment and reveal the different perspectives on this issue in the literature.

2.3. Oil Prices and Foreign Trade

There is a relationship between oil prices and foreign trade. Changing oil prices have a significant impact on macroeconomic variables and can affect a country's foreign trade. An increase in oil prices can have a greater impact on the economy, while a decrease in oil prices can lead to a greater decline in foreign trade turnover (Brancaccio et al., 2022; Beşer, 2019). In addition, as oil prices increase, international trade becomes more localized, and countries trade more with their neighbors. On the other hand, when oil prices fall, trade becomes more dispersed and the distance between countries becomes less relevant (Brancaccio et al., 2022). The elasticity of foreign trade with respect to ship fuel costs is also influenced by oil prices (Perstenyova and Zaychikova, 2020), indicating a noticeable asymmetry, especially at low and high oil prices.

3. DATA, METHODOLOGY AND RESULTS

This study examines the relationship between unemployment, oil prices, and terms of trade using data obtained from the World Bank for the years 1980-2021 (Table-1). The first and most important step in this process is to run stationarity tests. In unit root tests, in addition to the traditional methods, methods that deal with structural breaks were also used. Since the variables are stationary at the level, the analysis is continued with the VAR model. Then, autocorrelation and normality tests were applied to the model and no problems were encountered. In the next stage, variance decomposition and impulse response analyses were conducted. Finally, the Granger causality relationship is investigated.

Table 1. Data Used in Analysis

Variables	Abbreviation	Source
Terms of Trade	DTH	World Bank
Oil	PET	World Bank
Unemployment	UNEMP	World Bank

Figures 1, 2 and 3 show the course of the variables over the period 1980-2021.

Figure 1: Unemployment in Turkey (1980-2021)

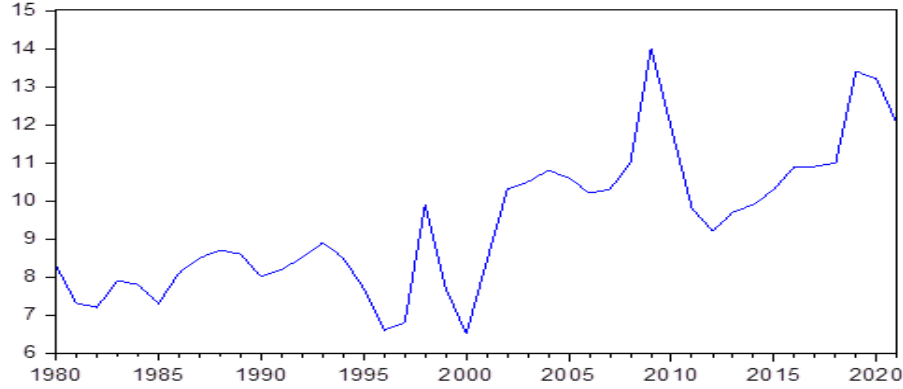


Figure 2: Terms of Trade in Turkey (1980-2021)

terms of trade

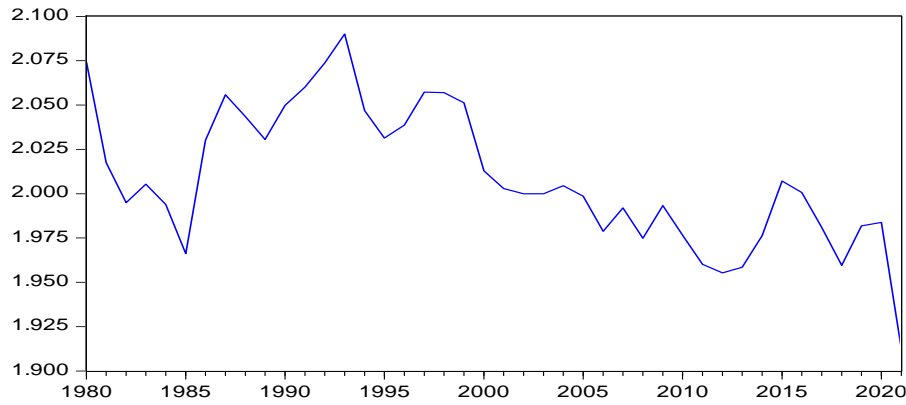
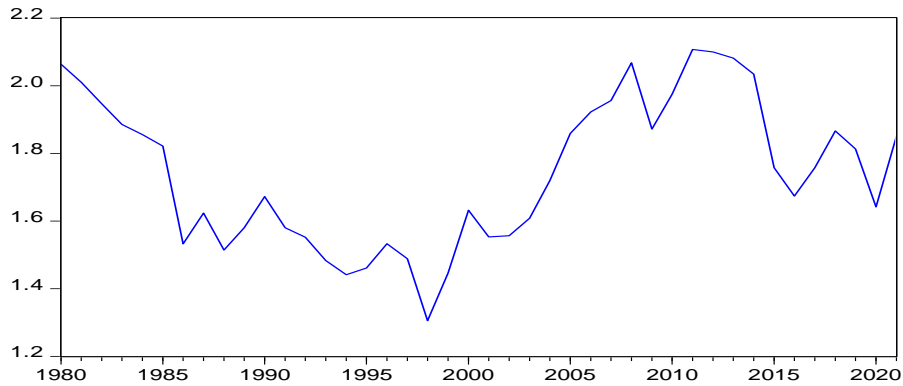


Figure 3: Oil Prices in Turkey (1980-2021)

logpet



Graphical analysis reveals that the variables have a trended structure.

3.1. Vector Autoregressive Models

Models in which each variable in an equation system is defined as a linear function of its lagged values and the lagged values of other variables are known as Vector Autoregressive Models (Çil Yavuz, 2015).

The bivariate p-th order standard vector autoregressive VAR (p) model for $t=1,2,3,..T$ can be written as follows (Sevüktekin & Çınar, 2017):

$$Y_{1t} = \delta_{1t} + \sum_{i=1}^p \beta_{1i} Y_{1t-i} + \sum_{i=1}^p \beta_{1i} Y_{2t-i} + \varepsilon_{1t} \quad (1)$$

$$Y_{2t} = \delta_{2t} + \sum_{i=1}^p \beta_{2i} Y_{1t-i} + \sum_{i=1}^p \beta_{2i} Y_{2t-i} + \varepsilon_{2t} \quad (2)$$

Here Y_{1t} and Y_{2t} are stationary variables and both ε_{1t} and ε_{2t} $\text{IID}(0, \sigma^2)$ are assumed to be clean sequences.

The results obtained from the estimation of the VAR model are sensitive to the correct determination of the appropriate lag length. The most common information criteria used in determining the lag length are Akaike information criterion (AIC), Schwarz-Bayesian information criterion (BIC), and Hannan-Quinn information criterion (HQ) (Çil Yavuz, 2015). The model with the lag length with the smallest information criterion is selected as the most appropriate model.

The purpose of VAR analysis is not to make parameter estimation, but to reveal the interaction between variables and to make predictions for these variables. The stable nature of the VAR model is related to whether the shocks are permanent or temporary. Therefore, for a stable model, the roots of the inverse characteristic equation must be outside the unit circle. In this case, past shocks can be calculated and shocks are temporary. If the roots of the inverse characteristic equation are less than or equal to 1, in other words, if the stability condition is not met, the process exhibits an exploding process and the shocks show a permanent feature. In this case, it will not be possible to accurately measure the relationships between the relevant variables.

In order for the results obtained in the estimated VAR model to be valid, assumptions such as the residuals complying with the normality assumption, the absence of autocorrelation in the order in which the VAR model was estimated, the absence of the problem of changing variance, the roots of the inverse characteristic equation must be provided (Özdemir, Doğaner & Çetin 2022).

The dynamic features of the VAR model are used in structural analyzes such as impulse response functions, variance decomposition and Granger Causality.

In the multivariate system, impulse response analysis and variance decomposition methods are used to examine the relationships between economic variables and the effect of shocks. It is possible to see the effect of a shock applied to a variable in the VAR model on other variables with impulse response analysis.

The variance decomposition, in other words, the prediction error variance decomposition, shows the ratio of the movements caused by the shocks of a variable and the changes caused by the shocks of other variables (Sevüktekin & Çınar, 2017). In the impulse response function, if a variable responds to the shocks of another variable, it means that there is a causal relationship between the related variables.

3.2. Granger Causality

One of the purposes of using VAR models is the prediction of the future, because the variable or group of variables in the system helps to make inferences about the predictive adequacy of other variables. Thus, Granger causality measures predictive adequacy, not actual causality. The direction of causality of the relationship between the series is determined by the analysis of Granger (1969). This test is used to determine the causal relationship between two or more variables (Çil Yavuz, 2015). In order to apply the Granger causality test, the variables must be stationary in the same order (Altınay & Karagöl, 2005). In addition, the same variables should be in equal lag lengths in the equations where the test will be applied.

In the Granger causality test, the equations and hypotheses can be expressed as follows:

$$Y_t = \alpha_1 + \sum_{i=1}^n \beta_i X_{t-i} + \sum_{j=1}^m \gamma_j Y_{t-j} + e_{1t} \quad (3)$$

H_0 : X is not the granger cause of Y.

H_1 : X is the granger cause of Y.

$$X_t = \alpha_2 + \sum_{i=1}^n \theta_i X_{t-i} + \sum_{j=1}^m \delta_j Y_{t-j} + e_{2t} \quad (4)$$

H_0 : Y is not the granger cause of X.

H_1 : Y is the granger cause of X.

According to the Granger test, if the prediction of the Y variable is more successful than the case where the past values of the X variable are used, X is the Granger cause of Y (Gujarati, 2006).

It shows the delay coefficients of $\beta_i, \gamma_j, \theta_i, \delta_j$ used in the equations. e_{1t} and e_{2t} are uncorrelated error terms in the White-noise feature.

If the β_i coefficients are different from zero at a certain significance level, the null hypothesis is rejected and a causal relationship is obtained from one-way X variable to Y variable. Likewise, if the null hypothesis for δ_j is rejected, one-way causality from variable Y to variable X is determined.

If both β_i and δ_j coefficients are different from zero, this time there is a bidirectional causality between the X variable and the Y variable. Finally, if all values of the coefficients β_i and δ_j are found to be zero, no causal relationship can be found between variable X and variable Y.

3.3. Analysis and Findings

In this study, data for the years 1980-2021 were used to examine the relationship between terms of trade (DTH), unemployment (UNEMP) and oil prices (PET). The data used in the study were compiled from the World Bank database. The terms of trade and logarithm of oil prices were included in the study.

The data of the variables to be analyzed with the VAR model must be stationary. In this context, firstly, Augmented Dickey-Fuller, Phillips-Perron and Lee-Strazicich unit root tests were conducted to determine whether the stationarities of the series were achieved. ADF test results for the unemployment series are presented in Table 2.

Table 2: Augmented Dickey-Fuller Unit Root Test Results for Series

	UNEMP		LogDTH		LogPET	
	Fixed	Fixed Trend	Fixed	Fixed Trend	Fixed	Fixed Trend
Test Statistic	-1,878326	-4,128989	-0,942153	-3,604162	-2,033289	-2,412965
%1	-3,600987	-4,205004	-3,600987	-4,198503	-3,600987	-4,198503
%5	-2,935001	-3,526609	-2,935001	-3,523623	-2,935001	-3,523623
%10	-2,605836	-3,194611	-2,605836	-3,192902	-2,605836	-3,192902

As it can be seen from Table 2, since the test statistic calculated in the fixed model for the unemployment, logDTH and logPET series is greater than the critical values calculated for 1%, 5% and 10%, the basic hypothesis suggesting that the series has unit root could not be rejected. However, in the fixed and trended model for unemployment and logDTH series, the unit root hypothesis was rejected at 5% and 10% significance levels, and the series were found to be stationary. For both models of the LogPET variable, the unit root hypothesis could not be rejected. Phillips-Perron Unit Root Test Results for the series are presented in Table 3.

Table 3: Phillips-Perron Unit Root Test Results for Series

	UNEMP		LogDTH		LogPET	
	Fixed	Fixed Trend	Fixed	Fixed Trend	Fixed	Fixed Trend
Test Statistic	-1,749579	-3,475623	-0,310196	-3,328963	-2,050407	-2,376838
%1	-3,600987	-4,198503	-3,600987	-4,198503	-3,600987	-4,198503
%5	-2,935001	-3,523623	-2,935001	-3,523623	-2,935001	-3,523623
%10	-2,605836	-3,192902	-2,605836	-3,192902	-2,605836	-3,192902

According to the results, the unit root hypothesis could not be rejected in the fixed model for unemployment and logDTH series. Unemployment and logDTH series were found to be stationary only at 10% level in the fixed and trend model. The LogPET series, on the other hand, was found to be unit rooted according to the Phillips-Perron test. Although there is a structural break in the time series, if the break is not taken into account, it is known that the stationary series tend to have a unit root. In this framework, a unit root test was performed with the Lee-Strazicich test, which takes into account two structural breaks. The Lee-Strazicich Unit Root Test results for the series are provided in Table 4.

Table 4: Lee-Strazich Unit Root Test Results for Series

	UNEMP	LogDTH	LogPET
Lag Length	11	8	8
Min. Test Statistic	-6,9994	-6,6382	-5,9205
Break Dates	1997-2016	1998-2015	1998-2003
%1 Critical Values	-6,42	-6,42	-6,45
%5 Critical Values	-5,65	-5,65	-5,67
%10 Critical Values	-5,32	-5,32	-5,31

According to the Lee-Strazich unit root test results, the hypothesis suggesting that the series is unit rooted under two structural breaks for the trend model for unemployment, logDTH and logPET series was rejected at the 5% significance level, and unemployment, logDTH and logPET series were accepted to be stationary with two structural breaks.

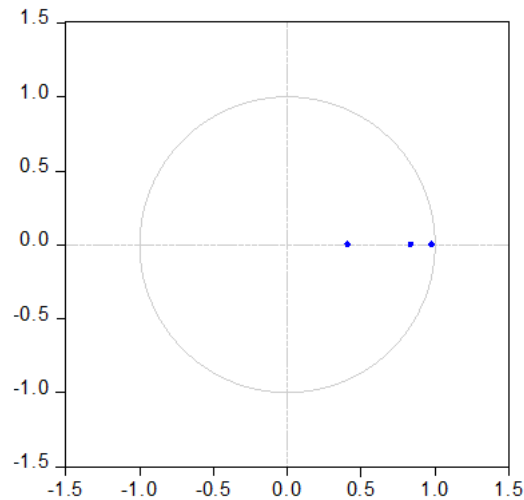
All series used in the study were at I(0) level. Since the endogenous variables in the VAR model are considered as a function of the lagged values of all the endogenous variables in the system, it is necessary to determine the optimum lag length. In this framework, first of all, the VAR model was estimated. The lag length of the VAR model was found to be 1 using information criteria. The estimation of the VAR model established with a delay of 1 is given in Table 5.

Table 5: VAR Model Estimation

	UNEMP	LogPET	LogDTH
UNEMP(-1)	0.623735 (0.11452) [5.44648]	0.032852 (0.01109) [2.96123]	-0.003619 (0.00190) [-1.90962]
LogPET(-1)	0.478654 (0.81869) [0.58466]	0.794622 (0.07931) [10.0194]	0.004294 (0.01355) [0.31692]
LogDTH(-1)	-16.22460 (6.52759) [-2.48554]	0.556453 (0.63234) [0.87998]	0.811211 (0.10804) [7.50870]
C	35.82138 (14.3475) [2.49669]	-1.088315 (1.38988) [-0.78303]	0.407821 (0.23746) [1.71742]

The significance of the model can be tested according to the position of the roots of the inverse polynomial in the circle, since it is extremely important that the entire model considered within the framework of the analysis is meaningful. In order for the constructed model to be stable, the inverse roots of the AR characteristic polynomial must be inside the unit circle. Figure 4 illustrates this situation.

Figure 4: Inverse Roots of the AR Characteristic Polynomial



The inverse roots of the characteristic polynomial AR are inside the unit circle. In addition, as it can be seen in Table 6, since all modulus values are below 1, it is understood that the stability condition of the model is met.

Table 6: Modulus Values

Root	Modulus
0.979893	0.979893
0.838351	0.838351
0.411324	0.411324

In this context, the analysis continued by testing the assumptions of the model and the results are given in Table 7.

Table 7: LM Autocorrelation Test Results

Normality Test				
Jarque-Berra	Probability			
8.530825	0.2017			
LM Autocorrelation Test				
Lag	LRE* statistic	Prob.	Rao F statistic	Prob.
1	6.022590	0.7377	6.664016	0.7382
2	5.807935	0.7590	0.639380	0.7595
3	4.325436	0.8887	0.471227	0.8890
Heteroscedasticity Test				
Chi-sq	Probability			
49.98627	0.0606			

Since the lag length of the established model is 1, considering the probability value for 1 lag, the LM autocorrelation test, varying variance test and normality test probability values are greater than 0.05, so there is no autocorrelation, varying variance and

normality problem in the model. Thus, the assumptions necessary for the results obtained in the estimated VAR model to be valid have been provided.

The variance decomposition method was applied in order to examine the effect of the independent variables used in the model on the dependent variable and to determine how much of the change in this framework was caused by the change in the independent variables and the results applied for 10 periods are given in Table 8.

Table 8: Variance Decomposition Results

LogDTH				
Period	S.E.	LogDTH	LogPET	UNEMP
1	0.017572	100.0000	0.000000	0.000000
2	0.022546	96.83003	0.959805	2.210167
3	0.025992	93.03860	2.057634	4.903769
4	0.028767	89.82382	2.940683	7.235497
5	0.031131	87.31013	3.590641	9.099233
6	0.033202	85.36522	4.061053	10.57373
7	0.035047	83.84110	4.404362	11.75454
8	0.036711	82.62312	4.659232	12.71765
9	0.038224	81.63001	4.852143	13.51785
10	0.039611	80.80528	5.000962	14.19376
LogPET				
Period	S.E.	LogDTH	LogPET	UNEMP
1	0.102849	12.85238	87.14762	0.000000
2	0.123744	10.25336	83.70250	6.044145
3	0.136941	8.995829	76.98004	14.02413
4	0.147276	8.655031	70.17132	21.17365
5	0.156147	9.132580	63.99541	26.87201
6	0.164248	10.33218	58.49149	31.17633
7	0.171960	12.10001	53.59819	34.30180
8	0.179476	14.25654	49.26243	36.48104
9	0.186879	16.63304	45.44100	37.92596
10	0.194185	19.09179	42.09144	38.81677
UNEMP				
Period	S.E.	LogDTH	LogPET	UNEMP
1	1.061694	2.064466	21.85607	76.07946
2	1.254361	4.217943	20.07485	75.70720
3	1.383454	10.09570	18.04104	71.86327
4	1.496104	16.39286	16.25869	67.34845
5	1.599301	21.92836	14.83059	63.24104
6	1.694707	26.52244	13.71369	59.76387
7	1.783225	30.29186	12.83931	56.86884
8	1.865583	33.39993	12.14759	54.45248
9	1.942405	35.98921	11.59291	52.41788
10	2.014225	38.17103	11.14187	50.68710

It is seen that the power to explain a change in the logDTH variable by the logPET variable is quite weak. Accordingly, 80% of a change in LogDTH at the end of 10 periods is explained by itself, while approximately 14% is explained by the unemployment variable.

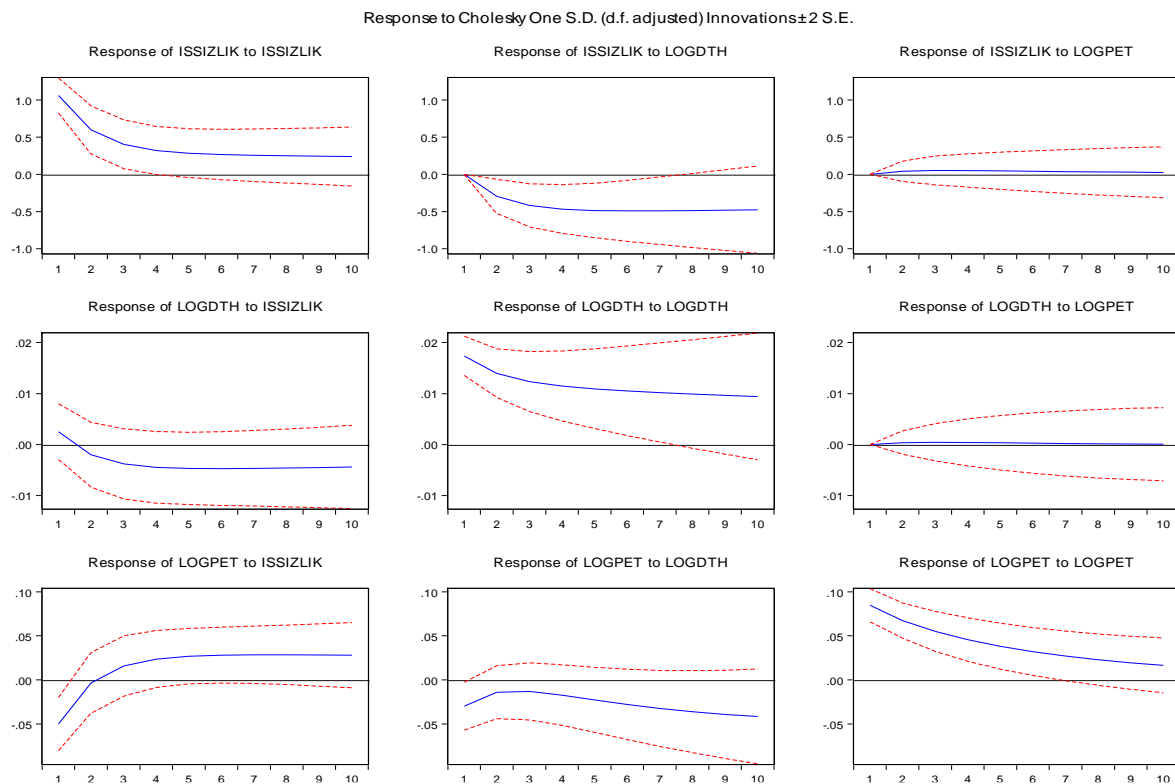
While the self-explanatory power of a change in the LogPET variable was 87% in the first period, this rate became 42% at the end of 10 periods. About 39% is explained by the unemployment variable. In the first period, the unemployment variable has no

explanatory power. According to this result of variance decomposition, it can be said that the unemployment variable better explains the changes in logPET at the end of 10 periods.

While the self-explanatory power of a change in the unemployment variable was 76% in the first period, it decreased to 50% at the end of 10 periods. About 38% of this change is explained by the logDTH variable, while only 11% is explained by the LogPET variable. At the end of 10 periods, it can be said that the logDTH variable better explains the changes in the unemployment variable.

The effect of stochastic shocks in independent variables on growth can be evaluated with impulse response analysis. The graphical representation of the said effects is shown in Figure 5.

Figure 5: Impulse-Response Analysis Charts



When a one-unit shock is given to the unemployment error term, unemployment is positively affected by this shock. The said positive effect continues to decrease for four periods, but it does not disappear. After 4 periods, the decreasing trend disappears and the positive effect remains constant. When a unit shock is given to the LogDTH error term, unemployment is negatively affected by the shock. The said effect gradually increases, but becomes stable after three periods. When a unit shock is given to the LogPET error term, unemployment gives a very low positive response. However, this reaction disappears later. When a unit shock is given to the unemployment error term, logDTH is affected positively at first, but this effect disappears after a period.

When a unit shock is given to the LogDTH error term, the variable itself is positively affected, but the positive effect decreases over time. When a unit shock is applied to the LogPET error term, LogDTH gives a very small positive response, but this effect soon disappears. LogPET reacts negatively when a unit shock is given to the unemployment error term, but this effect disappears after 2 periods. LogPET is negatively affected when a unit shock is applied to the LogDTH error term. When a unit shock is given to the LogPET error term, LogPET is positively affected, but the said positive effect gradually decreases.

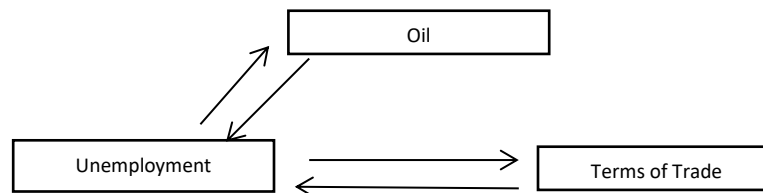
At this stage of the study, the causal relationship between the variables was investigated. The results of Granger causality analysis are summarized in Table 9.

Table 9: Granger Causality Analysis Results

H ₀ Hypothesis	F statistic	Prob.
H ₀ : Unemployment is not the cause of Oil prices Granger	8.17972	0.0012
H ₀ : Unemployment is not the Granger cause of the terms of trade	5.59350	0.0078
H ₀ : The terms of trade are not the Granger cause of unemployment.	8.81530	0.0008
H ₀ : The terms of trade are not the Granger cause of oil prices.	0.38227	0.6851
H ₀ : Oil prices are not the Granger cause of the terms of trade.	0.21745	0.8056

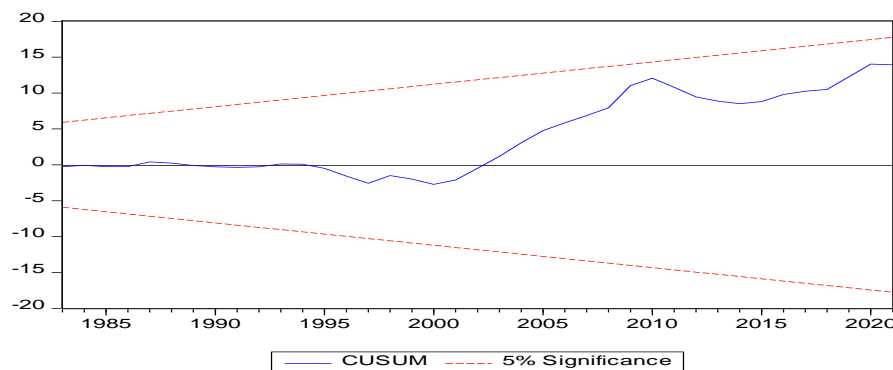
According to the results of Granger causality analysis, bidirectional causality was found between terms of trade and unemployment, and between oil prices and unemployment (Fig. 6).

Figure 6: Results of the Analysis



Finally, the presence of structural stability in the model was investigated with the Cusum test. The main hypothesis of the Cusum test suggests the existence of structural stability. The alternative hypothesis is structural break. The test result is shown in Figure 7.

Figure 7: Cusum Test Result



In Figure 7, the blue graph falls between the red dashed lines. In this case, the basic hypothesis suggesting that there is structural stability in the model could not be rejected.

5. CONCLUSION

Development in a process of developing countries must be aimed at changing a certain institutional, social, and economic infrastructure for improving living standards. The process has some targets which include promoting economic growth, reduction of poverty, improving health and education system, making infrastructure investments, and advancing on sustainable development. In order for the backward countries' economies to rise, they need to focus on development. Oil prices have a major impact on their development process. Oil is one of the main resources that many emerging countries depend on since it is used to fuel energy requirements. Oil price fluctuation affect economic growth of developing countries as it increases cost of imported

goods and services into these countries. However, the impact of oil price change on development would vary greatly depending on if a country is net importer or exporter of oil. The developing countries' external economic relations are vital part of the process of development. These nations are net importers of most raw materials and the capital goods they require. However, any deterioration in their trade conditions would cap their ability to import more goods which in turn could hinder their development. Nevertheless, there are prospects for speeding up this process through positive advancements. Another important factor is unemployment, which needs to be considered in the development process of developing countries. The decline in production capacity caused by high unemployment rates can have a negative impact on economic growth. Therefore, reducing unemployment rates is critical for a country's economic development. In this context, understanding the complex interactions among economic factors, especially analyzing the relationships among critical variables such as oil prices, foreign trade and unemployment, is of great importance today. This research explores how oil prices and international trade impact joblessness. It aims to reveal how developing nations grow by untangling the complicated relationships between these different factors.

In this study, various analyses were applied to examine the relationship between terms of trade, unemployment and oil prices using data from 1980-2021. According to the variance decomposition results, while 80% of a change in the terms of trade is explained by itself at the end of 10 periods, about 14% is explained by the unemployment variable. While the self-explanatory power of a change in the oil variable is 42% at the end of 10 periods, approximately 39% of it is explained by the unemployment variable. While the self-explanatory power of a change in the unemployment variable is 50% at the end of 10 periods, 38% of it is explained by the terms of trade variable. According to the results of impulse response analysis, when a one-unit shock is given to the unemployment error term, unemployment is positively affected by this shock. When a unit shock is given to the terms of trade error term, unemployment is negatively affected by the shock. When a unit shock is given to the Oil error term, unemployment gives a very low positive response. When a unit shock is given to the unemployment error term, terms of trade is affected positively at first, but this effect disappears after a period of time. When a unit shock is given to the terms of trade error term, the variable itself is positively affected, but the positive effect decreases over time. When a unit shock is applied to the Oil error term, terms of trade give a very small positive response, but this effect soon disappears. Oil reacts negatively when a unit shock is given to the unemployment error term, but this effect disappears after 2 periods. Oil is negatively affected when a unit shock is applied to the terms of trade error term. When a unit shock is given to the Oil error term, Oil is positively affected, but the said positive effect gradually decreases. According to the results of Granger causality tests, there is a bidirectional causality between terms of trade and unemployment. In addition, bidirectional causality was found between oil prices and unemployment.

Terms of trade are highly important for economic growth and employment. An improvement in the country's volume of foreign trade supports economic growth by expanding exports and contributes positively to employment. A deterioration in the volume of foreign trade, on the other hand, increases imports, negatively affects domestic production and leads to an increase in unemployment rates. Another point to be taken into account is the effect of unemployment rates on the terms of trade. In case of high unemployment, imports are also adversely affected as the amount of consumption decreases. Moreover, high unemployment rates also negatively affect the volume of production and exports. Therefore, there is a bidirectional causality relationship between unemployment and terms of trade. Increasing unemployment rates negatively affect the terms of trade, while a decline in the terms of trade increases unemployment rates by reducing the level of employment. As a result of rising production costs brought on by rising oil prices, production volume is decreased, and unemployment rates rise. Reduced consumption results from higher unemployment rates, which also lowers the demand for oil. Production capacity declines in nations with high unemployment rates, which has an adverse effect on the demand for oil. As a result, the relationship between oil prices and unemployment is reciprocal. Higher oil prices lead to higher unemployment rates, while higher unemployment rates have an impact on higher oil prices.

This study makes an important contribution to understanding the complex relationships between oil prices, terms of trade and unemployment, which play a critical role in the development processes of developing countries. In light of the findings, first of all, policies to reduce the energy dependence of developing countries and strategies to diversify energy sources should be implemented. Moreover, careful planning and management of foreign trade policies are critical to keep import costs under control and support economic growth. It is also important to develop and implement employment policies to reduce unemployment rates. Future research needs to analyze the relationships in these areas in more detail and depth. In particular, examining the effects of economic activity and industrial structures in specific sectors on oil prices, terms of trade and unemployment could provide further insights. In addition, studies that take into account the specific conditions and economic structures of different developing countries can provide a broader perspective and better guide policy recommendations.

REFERENCES

- Abugamea, G. (2018). Determinants of Unemployment: Empirical Evidence from Palestine (No. 89424). University Library of Munich, Germany.
- Adeosun, O. A., Olayeni, R. O., Tabash, M. I., Anagreh, S. (2023). The dynamics of oil prices, uncertainty measures and unemployment: a time and frequency approach. *China Finance Review International*, 13(4), 682-713.
- Alkhateeb, T. T., Mahmood, H., Sultan, Z. A., & Ahmad, N. (2017). Oil price and employment nexus in Saudi Arabia. *International Journal of Energy Economics and Policy*, 7(3), 277 - 281.
- Altınay, G., & Karagol, E. (2005). Electricity Consumption and Economic Growth: Evidence from Turkey. *Energy Economics*, 27, 849-856.
- Ananjeva, N.B. (2023). Oil price uncertainty and unemployment dynamics: Nonlinearities matter. *Energy Economics*, 106806-106806.
- Belenky, M., Riker, D. (2015). Theory and empirical evidence linking international trade to unemployment rates. *Journal of International Commerce and Economics*, 5(3), 166-181.
- Beşer, N. Ö. (2019). The effect of oil prices on foreign trade deficit in the economics of Bulgaria. *Theoretical and Applied Economics*, 26(3), 159-170.
- Bildirici, M., Özaksoy Sonüstün, F. (2019). Chaotic structure of oil prices, inflation, and unemployment. *Nonlinear Dynamics, Psychology, and Life Sciences*, 23(3), 377-394.
- Bjornland, H.C. (2006) The dynamic effects of aggregate demand, supply and oil price shocks: a comparative study. *The Manchester School*, 68(5), 578-607.
- Braccaccio, G., Kalouptsi, M., Papageorgiou, T. (2022). The impact of oil prices on world trade. *Review of International Economics*, 31(2), 444-463.
- Caligagan, Angelica Anne M, Ching, R. R., & Suin, Kristine April. (2022). An analysis on the economic factors affecting the unemployment rate in the Philippines from 1993-2018. *Journal of Economics, Finance and Accounting Studies*, 4(2), 01–17.
- Cütcü, İ., Cenger, H. (2017). The relationship between foreign trade and unemployment in Turkey: time series analysis with structural breaks. III. *International Entrepreneurship, Employment and Career Congress*, October 12-15, 2017, Muğla, Türkiye.
- Çil Yavuz, N. (2015). *Financial Econometrics*. Istanbul: DER Publications.
- Dutt, P., Mitra, D., & Ranjan, P. (2009). International trade and unemployment: Theory and cross-national evidence. *Journal of International Economics*, 78(1), 32-44.
- Ersungur Ş. M. Özdemir D., Tiğtepe E. (2021). The effect of foreign trade on employment: a panel data analysis on OECD countries. *Atatürk University Journal of Economics and Administrative Sciences*, 35(4), 1335-1368.
- Fernandez, K.M., Jha, K., & Jam'an, N.F. (2011). Oil price fluctuations and macroeconomic performance in Asian and Oceanic economies. Retrieved from <http://hdl.handle.net/10356/44331>
- Granger, C. W. (1969). Investigating causal relations by econometric models and cross-spectral methods. *Econometrica*, 424-438.
- Gujarati, N. (2006). *Basic Econometrics*. Istanbul: Literatür Publishing.
- Gibson, B. (2011). Assessing the impact of trade on employment. *Trade and Employment: From Myth to Facts*, <https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=62ed8bf9f086596054386253feb975f4678a2a70>
- Gül, E., Kamacı, A. (2012). The effects of foreign trade on employment: A panel data analysis. 4(3), 81-91.
- Hung, L. W., Peng, S. K. (2019). Unemployment with trade and firm heterogeneity. *International Journal of Economic Theory*. 16(1), 62-81.
- Jin, C., Lee, S., Hwang, J. (2019). The impact of import and export on unemployment: a cross-national analysis. *International Journal of Sustainable Economy*, 11(4), 347-363.
- Nanovsky, S. (2019). The impact of oil prices on trade. *Review of International Economics*, 27(1), 431-447.
- Nguyen, A.T. (2022). The relationship between economic growth, foreign direct investment, trade openness, and unemployment in South Asia. *Asian Academy of Management Journal*, 27(2), 21–40.
- Nwosa, P., Keji, J., Adegboyo, S., Fasina, O. (2020). Trade openness and unemployment rate in Nigeria. *Oradea Journal of Business and Economics*, 5(2), 52-62.
- Ordóñez, J., Monfort, M., Cuestas, J. C. (2019). Oil prices, unemployment and the financial crisis in oil-importing countries: The case of Spain. *Energy*, 181, 625-634.

Özdemir, Z., Doğaner, A., Çetin, G. (2022). Economic growth and carbon relationship: the case of Germany. *Journal of Süleyman Demirel University Faculty of Economics and Administrative Sciences*, 27(3), 509-521.

Perstenyova, N. P., Zaychikova, N. A. (2021). Analyzing Oil Prices Impact on Russian Foreign Trade. In: Ashmarina, S.I., Horák, J., Vrbka, J., Šuleř, P. (eds) *Economic Systems in the New Era: Stable Systems in an Unstable World*. IES 2020. *Lecture Notes in Networks and Systems*, vol. 160. Springer, Cham. https://doi.org/10.1007/978-3-030-60929-0_90

Raifu, I. A., Aminu, A., Folawewo, A. O. (2020). Investigating the relationship between changes in oil prices and unemployment rate in Nigeria: linear and nonlinear autoregressive distributed lag approaches. *Future Business Journal*, 6, 28-41.

Senzangakhona, P., & Choga, I. (2015). Crude Oil Prices and Unemployment in South Africa: 1990 – 2010. *Mediterranean Journal of Social Sciences*, 6(2), 407.

Sevüktekin, M., Çınar, M. (2017). *Econometric Time Series Analysis*. Bursa: Dora Publishing.

Shuddhasattwa, R., Ruhul, S., Pasquale, M. S. (2018). Energy, unemployment, and trade. *Applied Economics*, 50(47), 5122-5134.

Sinan, B. (2018). International oil prices in Turkey: 1980-2016. *Journal of Finance, Economics and Social Research*, 3(4), 681-695.

Trang, N. T. N., Tho, T. N., & Hong, D. T. T. (2017). The impact of oil price on the growth, inflation, unemployment, and budget deficit of Vietnam. *International Journal of Energy Economics and Policy*, 7(3), 42-49.

PREDICTING FINANCIAL DISTRESS USING SUPERVISED MACHINE LEARNING ALGORITHMS: AN APPLICATION ON BORSA ISTANBUL

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ABSTRACT

Purpose- The main purpose of this study is to identify the most significant variables to detect financial distress earlier and to find the best machine learning algorithm model.

Methodology- This study has used Support Vector Machine, Logistic Regression, Random Forest and K-nearest neighbors method techniques to predict the financial distress prediction for the companies of Turkey between 2012 and 2021.

Findings- As a result of the study, it has been determined that Random Forest provides the best results in terms of precision, accuracy, and recall. Further, this study has found the most important five independent variables to determine the financial distress status of the firms. In this way, it has been found that Current Assets/ Current Liabilities, Working Capital / Total Assets, Gross profit / Revenue, Retained Earnings / Total Assets and Sales growth rate are the most useful variables to determine financial distress status of Turkish firms earlier.

Conclusion- This study has concluded that cash ratios and profitability ratios and sales growth are the most important independent variables to determine financial distress one-year ahead. Furthermore, it has been found that random forest is the best machine learning method among other supervised machine learning methods used in this study.

Keywords: Financial distress, support vector machine, logistic regression, random forest, k-nearest neighbors

JEL Codes: G32, G33, C52.

1. INTRODUCTION

The prediction of bankruptcy is one of the most pressing issues in finance. As a result, financial distress (i.e. bankruptcy likelihood) prediction continues to be a hot topic in finance research (Elhoseny et al., 2022). Studies on predicting financial distress have been in progress for more than a half century. To identify the corporate solvency the financial distress prediction is a key issue. The primary objective of the financial distress prediction is to distinguish the stabilize companies from firms at the risk of financial distress. Financial risk is important for the investors as they decide to invest with their risk preferences. Regulators also benefit from the rapid identification of risk of each firm and are able to perform well in terms of supervision and management. The result of this has been a growing interest in the accurate prediction of business risks both in academia and in the business community (Qian et al., 2022).

While a consensus definition of financial distress remains elusive, it is acknowledged that varying degrees of financial distress exist. In its mildest form, financial distress may manifest as a shortage of cash. On the other hand, the most severe cases may involve a liquidity crisis or even bankruptcy (Özparlak and Özdemir Dilidüzgün, 2022). Although bankruptcy and financial failure are used interchangeably, bankruptcy is defined as the last resort to recover from a financial failure (Kinay, 2010).

Samuel & Gabel (1959) introduced the term "Machine Learning" and described it as a method of self-learning for computers without the use of a guide. Machine learning models build their models based on past data and improve their learning level independently (Gerçek & Özdemir Dilidüzgün, 2022). Machine learning techniques are regarded as the most popular algorithm techniques nowadays. These techniques are known for their accurate predictability performance. In case the outcome of the data is given previously then the supervised techniques are utilized. Furthermore, the supervised learning techniques categorize the outcome based on their labels (Özlem & Tan, 2022).

Recent global economic recession, highly volatile exchange rates, and a soured inflation rate have led to many firms in Turkey declaring bankruptcy (Aker and Karavardar, 2023). As of 2020, Turkey is the country with the highest number of bankruptcies and the second highest debt ratio among developing countries (Institute of International Finance, 2021). It has also been reported that 80 percent of newly established Turkish companies go into bankruptcy within their first five years of operation (Bloomberg, 2018). Accordingly, this study analyzes the bankruptcy likelihood of Turkish companies using supervised machine learning techniques. Based on supervised machine learning algorithms, this study has examined 477 companies that operate on the Borsa Istanbul exchange between 2012 and 2021. For this study, companies with negative net income for two consecutive years are defined as distressed and non-distressed otherwise.

This paper is divided into several sections. A discussion of national and international research is presented in the second part of this paper. The third section provides a description of how machine learning algorithms work as well as their methodology. The fourth section identifies the source of data and defines dependent and independent variables; the fifth section discusses results. As part of the final section of this study, the implications and limitations of the study are discussed.

2. LITERATURE REVIEW

The first dominant studies in financial distress prediction were conducted by Altman (1968), Ohlson (1980) and Zmijewski (1984). While each prediction model used different variables and statistical methods all models used accounting variables as a common feature (Avenhuis, 2013). Later on, several models were developed to predict financial distress of firms.

The study conducted by Oribel & Hanggraeni (2021) used Indonesian companies to determine their distress level. In their comprehensive study, the Support Vector Machine (SVM) method was applied, and it has ended up with 90% accuracy rate. This study followed Altman et al.'s (2010) definition of determining the financial distress of companies. Further it has been concluded that the linear SVM outperforms the radial and polynomial SVM models.

In their study, Qian et al. (2022) classified companies into distressed and non-distressed entities. Furthermore, they utilized a variety of machine learning methodologies including SVMs, artificial neural networks (ANNs), decision trees (DTs), random forests (RFs), and logistic regression in order to analyze the data. Accordingly, they found that the gradient boosted decision tree with the corrected feature selection measure outperforms all other models.

In a more extended context Elhoseny et al. (2022) have examined financial distress and credit risk assessment. They use companies from Taiwan, Australia and Poland as a sample to determine their financial distress and credit risk assessment. In this way, a novel approach has been developed and put forward. In terms of accuracy and precision, the adaptive whale optimization algorithm (AWOA-DL) has been compared with other models, including DNN, TLBO-DL, LR, and RBF Network. According to their results, this novel approach allows for more precise fine-tuning parameters and achieved a 95.8% accuracy rate with its dominance compared to other methods. To build on this, Tsai et al. (2014) used three different machine learning techniques to predict the bankruptcy likelihood of German, Australian and Japanese firms. In this way, multilayer perceptron (MLP) neural networks and SVM are compared with decision trees with a boosting method. Consequently, it has been found that decision trees with a boosting method provide higher accuracy.

Lin et al. (2011) have selected a few features to conduct machine learning techniques. A number of important variables have been identified through the use of data mining techniques. A total of 74 financial ratios have been selected as the best subset of the variables of companies listed on the Taiwan Stock Exchange. Afterward, 5 selected ratios were used to predict financial distress for firms one year ahead. A comparison was made with other classic models (Altman Edward I., 1968; Beaver, 1966; Zmijewski, 1984; Ohlson, 1980). As a result, the model with selected features outperforms classical models, and this was conducted using MDA, Logit, Neural Network, and SVM models. Additionally, the SVM model produces better results when certain variables are considered.

By focusing on the Turkish context, it is evident that several different studies have applied machine learning algorithms to predict financial distress. A recent study conducted by Aker and Karavardar (2023) has used Logistic Regression, Decision Tree, Random Forest, Support Vector Machines, K-Nearest Neighbor and Naive Bayes algorithms to predict financial distress of Turkish firms earlier. They have found that Naive Bayes has a superior prediction ability than other models. In a similar vein, İçerli (2005) has examined the financial distress of Turkish firms for the years between 1990 and 2003. In comparison to other algorithms they use, such as logistic regression and discriminant analysis, artificial neural networks are better at predicting financial distress. To build on this Aksoy and Boztosun (2018) investigated the same prediction by using manufacturing firms operating in Turkey between 2006 and 2009. Using multiple discriminant analysis and logistic regression, they concluded that logistic regression is more effective at detecting financial distress early.

3. METHODOLOGY

3.1. Logistic Regression

Logistic regression is considered as a classification method rather than regression model and thus it transfers the probability value into 0 or 1. In logistic regression the outcome variable takes two different variables i.e. binary. This method is very useful to predict categorical variables. The binary outcome is estimated with the independent variables to acquire information. Logistic regression employs maximum likelihood of observing data.

$$\text{logit}(p)=\ln(p/1-p) = \alpha + \beta_1X_1+\dots B_nX_n \quad (1)$$

In this equation increasing X by one unit changes the log odds by β_1 . In addition to that, independent variables shouldn't be multicollinear and the log-odds of the outcome and independent variables should be linear.

3.2. Support Vector Machines

Based on statistical learning theory, Support Vector Machines are machine learning algorithms. By utilizing feature function fitting, this method is able to work with samples of small, non-linear data for high dimensional pattern recognition (Cortes & Vladimir, 1995). SVM is used to separate two different classes or to detect the outliers. This method is especially handy where two different classes exist. In this manner, SVM uses hyperplane to categorize the variables. This yield better results compared to other methods in terms of classification (Malik et al., 2021). The original SVM algorithm can be expressed as mathematical formula below:

$$y(x)=\text{sign}(\sum y_i \alpha_i K(x,x_i)+b) \quad (2)$$

Where $y(x)$ represents the predicted class label for the input vector x ; y_i is the class label for the i -th example; α_i are the Lagrange multipliers obtained during training; $K(x_i, x)$ is the radial kernel function that measures the similarity between two feature vectors; b is the bias term. In this sense there are different kernels to be chosen in SVM algorithms such as linear, kernel and polynomial. The linear kernel is applied where the model can be classified by a linear decision boundary whereas radial kernel is applied for the datasets which is suitable for most of the dataset and has versatile functions.

3.3. Random Forest

Random forest techniques belong to ensemble learning family and used for classification and regression tasks. This technique is known for its robustness and accuracy to handle high dimensional datasets. In this technique, multiple decision trees are combined and used to predict an outcome of the model. Each decision tree in the random forest is constructed by recursively dividing the feature space. The splitting process has a target of gaining more information at each node (Breiman, 2001).

The random forest is also well known for its variable importance measures. In this way, this technique has two different methods for measuring variable importance, namely mean decrease Gini and mean decrease accuracy. While the former one is the decrease in Gini impurities for the predictor across the forest, the latter one is the average decrease in accuracy for the predictor after permuting (Nicodemus, 2011).

3.4. K-nearest Neighbors (KNN) Method

K-nearest neighbors (KNN) method has both classification and regression features. First KNN algorithms leave a distance between observed data and further identify new data with not known target. In this learning method either Euclidean or Manhattan distances are employed to measure the proximity between variables. The K parameter in this model is used to determine the number of neighbours for this model. The optimal K parameter is chosen based on the cross-validation techniques. During the training KNN stores independent variables vectors and their corresponding values. During the prediction the distance between query point is calculated and the K nearest neighbour is selected based on the majority or average value (Zhang, 2016).

4. DATA

This study uses the several data from Turkey. In this manner the financial data of 227 firms listed in Borsa İstanbul from 2012 and 2021 has been extracted from Thomson-Reuters database. To label the target variables the firms are labelled as D (distressed) and ND (non- distressed) to represent their financial distress status. To determine the distress status of companies this study considered their net income. Following previous literature, companies with negative net income for two consecutive years are classified as distressed and non-distressed otherwise (Altman Edward I., 1968; DeAngelo & DeAngelo, 1990; Hill et al., 1996; Li & Sun, 2008; Oz & Yelkenci, 2017; Oz & Simga-Mugan, 2018).

By combining the sample and floor functions, the dataset has been divided into training and test sets. Data representing 80% of the dataset is used as training data and data representing the remaining 20% of the dataset is used as test data. A ratio of 8:2 is used for the distribution of the test and training sets, in accordance with previous studies (Oribel & Hanggraeni, 2021; Lin et al., 2011). This study contains 27 independent variables, and the objective is to identify the five most significant variables from them. Appendix-A contains a list of all independent variables that were used. Accordingly, the variable importance measure has been implemented, and these variables are measured in descending order. By ensuring the absence of multicollinearity, the five most important independent variables were selected for logistic regression analysis. The variables identified as the most useful variables and the variables used in other studies were found to be consistent (see: Altman Edward I., 1968; Zmijewski, 1984 ;Ohlson, 1980). The selected variables are listed in Table 1, along with their formulas, and descriptive statistics are shown in Table 2.

Table 1: Independent Variables

No	Formula
V1	Current Assets/ Current Liabilities
V2	Working Capital / Total Assets
V3	Gross profit / Revenue
V4	Retained Earnings / Total Assets
V5	Sales growth

Table 2: Descriptive Statistics

Variable	Minimum	Maximum	Mean	Median
V1	0.02388	136.58753	1.85775	0.96466
V2	3.40526	0.99779	0.13798	0.12590
V3	-1.2907	1.0349	0.2385	0.2099
V4	-51.409	0.40127	-0.01571	0.02066
V5	-17.567	57.35006	0.03025	-0.04180

5. RESULTS AND DISCUSSIONS

Table 3 below presents the results of the logistic regression after labeling the outcome variables as D and ND. To assess the multicollinearity among independent variables, the variance inflation factor was applied. Table 4 illustrates the variance inflation factor for the variables.

Table 3: Logistic Regression Results

Variable	Estimate	Std. Error	z value	Pr(> z)	Pr(> z)
Intercept	0.84096	0.16556	5.080		3.78e-07***
V1	0.16307	0.13301	1.226		0.220
V2	2.40802	0.43395	5.549		2.87e-08***
V3	2.39252	0.49560	4.827		1.38e-06***
V4	0.02005	0.05166	0.388		0.698
V5	-0.01838	0.03863	-0.476		0.634

Table 4: Variance Inflation Factor

Variable	Estimate
V1	1.603506
V2	1.605755
V3	1.001814
V4	1.001963
V5	1.002182

On the basis of the above test results, it can be concluded that the gross profit percentage ratio and the ratio of working capital divided by total assets are important indicators of financial distress one year in advance. The variance inflation factor levels show that there is no need to concern multicollinearity in this dataset.

In Table 5, the precision, accuracy, and recall values of other machine learning techniques such as KNN, SVM, and Random Forest methods have been presented. These techniques are evaluated based on the precision, accuracy and recall metrics. These metrics are calculated based on the true positive (TP), true negative (TN), false positive (FP), and false negative (FN).

- Precision: Precision is the ratio of correctly identified positive cases in a classification scenario. This metric is computed as proportion of true positive predictions on the total positive predictions.
- Accuracy: As a percentage, accuracy measures the percentage of cases correctly identified to the total number of cases.
- Recall: Recall measures the proportion of positive cases that are correctly estimated to all positive cases

Table 5: Classification Performance Comparison

Models	Precision	Accuracy	Recall
SVM	0.84	0.88	0.94
Random forest	0.91	0.95	0.99
KNN	0.72	0.79	0.95
Formula	$(TP / TP + FP)$	$(TP + TN / TP + TN + FP + FN)$	$(TP / TP + FN)$

According to test results it can be concluded that random forests outperform other methods in terms of accuracy, precision and sensitivity. This method is followed by the SVM model which has been conducted with linear kernel. The last method, namely KNN, is less accurate compared to other methods. The test result has shown that the financial status of a firm can be predicted one year ahead whether the firm is in a distressed position or not.

6. CONCLUSION

Predicting financial distress is an important component of risk management, especially in countries with high inflation, such as Turkey. Detecting financial distress early can prevent creditors from incurring losses. Additionally, this early detection mechanism will help to mitigate the impact of bankruptcy on shareholders, employees, and other stakeholders. In order for a country's economy to be in good shape, companies must operate efficiently and without difficulty. This implies that the consequences for the financial health of firms do not just affect microeconomics, but also macroeconomics.

In this study, early financial distress detection has been measured through several supervised machine learning models. In this way, 227 firms have been used from Borsa Istanbul between the years of 2012 and 2021. As a result, it has been concluded that cash ratios and profitability ratios and sales growth are the most important independent variables to determine financial distress one-year ahead. Furthermore, it has been found that random forest is the best machine learning method among other supervised machine learning methods used in this study. It may be beneficial for firms that feel likely to go bankrupt to focus on the most important factors that will enable them to recover sooner, or to avoid going bankrupt. Several implications are derived from the findings of this study for policy makers, managers, and academics alike.

Despite its strengths, this study is not without limitations. First, the selected variables and logistic regression results cannot be generalized to all countries. As a result of the limited number of methods used, the results of deep learning, neural networks, etc. methods have not been evaluated. To evaluate the predictive ability of the independent variables in this study, further studies should consider other methods. Financial distress has been predicted solely through financial variables in this study; however, other non-financial metrics (for example, the number of employees, the existence of an audit committee, board composition, firm age) and macroeconomic variables (for example, inflation rate, exchange rate, interest rate) should also be considered to arrive at new insights. Moreover, the impact of the recent financial crisis COVID-19 can be incorporated in order to determine how it plays a moderating role in the emergence of financial distress indicators.

REFERENCES

- Aker, Y., & Karavardar, A. (2023). Using machine learning methods in financial distress prediction: sample of small and medium sized enterprises operating in Turkey. *Ege Akademik Bakis*, 23(2), 145-162
- Aksoy, B., & Boztosun, D. (2018). Financial failure prediction by using discriminant and logistics regression methods: evidence from BIST manufacturing sector. *Finans Politik & Ekonomik Yorumlar*, 646, 9–32.
- Zhang, L., Altman, E. I. & Yen, J. (2010). Corporate financial distress diagnosis model and application in credit rating for listing firms in China. *Frontiers of Computer Science in China*, 4, 220-236.
- Altman Edward I. (1968). Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. *Journal of Finance*, 23(4), 189–209.
- Oude Avenhuis, J. (2013). Testing the generalizability of the bankruptcy prediction models of Altman, Ohlson and Zmijewski for Dutch listed and

- large non-listed firms (Master's thesis, University of Twente).
- Beaver, W. H. (1966). Financial ratios as predictors of failure. *Journal of Accounting Research*, 71-111.
- Breiman, L. (2001). Random forests. *Machine Learning*, 45, 5-32.
- Cortes, C., & Vapnik, V. (1995). Support-vector networks. *Machine Learning*, 20, 273-297.
- DeAngelo, H., & DeAngelo, L. (1990). Dividend policy and financial distress: an empirical investigation of troubled NYSE firms. *Journal of Finance*, 45(5), 1415-1431.
- Elhoseny, M., Metawa, N., Sztano, G., & El-Hasnony, I. M. (2022). Deep learning-based model for financial distress prediction. *Annals of Operations Research*, 11(2), 1-23.
- Hill, N. T., Perry, S. E., & Andes, S. (1996). Evaluating firms in financial distress: An event history analysis. *Journal of Applied Business Research (JABR)*, 12(3), 60-71.
- İçerli, M. Y. (2005). Prediction of Financial Failure in Businesses and an Application (PhD thesis, University of Dokuz Eylül)
- Institute of International Finance. (2021). Global Debt Monitor COVID Drives Debt Surge — Stabilization Ahead ?
- Kinay, B. (2010). Ordered Logit Model approach for the determination of financial distress. *Numéro spécial*, 119-131.
- Li, H., & Sun, J. (2008). Ranking-order case-based reasoning for financial distress prediction. *Knowledge-Based Systems*, 21(8), 868-878.
- Lin, F., Liang, D., & Chen, E. (2011). Financial ratio selection for business crisis prediction. *Expert Systems with Applications*, 38(12), 15094-15102.
- Malik, H., Fatema, N., & Iqbal, A. (2021). Intelligent data-analytics for condition monitoring: smart grid applications. Academic Press.
- Nicodemus, K. K. (2011). On the stability and ranking of predictors from random forest variable importance measures. *Briefings in Bioinformatics*, 12(4), 369-373.
- Ohlson, J. A. (1980). Financial ratios and the probabilistic prediction of bankruptcy. *Journal of Accounting Research*, 5(2), 109-131.
- Oribel, T., & Hanggraeni, D. (2021). An application of machine learning in financial distress prediction cases in Indonesia. *International Journal of Business and Technology Management*, 3(2), 98-110.
- Oz, I. O., & Simga-Mugan, C. (2018). Bankruptcy prediction models' generalizability: Evidence from emerging market economies. *Advances in Accounting*, 41, 114-125.
- Oz, I. O., & Yelkenci, T. (2017). A theoretical approach to financial distress prediction modeling. *Managerial Finance*, 43(2), 212-230.
- Özlem, Ş., & Tan, O. F. (2022). Predicting cash holdings using supervised machine learning algorithms. *Financial Innovation*, 8(1), 1-19.
- Özparlak, G., & Dilidüzgün, M. Ö. (2022). Corporate bankruptcy prediction using machine learning methods: the case of the USA. *Uluslararası Yönetim İktisat ve İşletme Dergisi*, 18(4), 1007-1031.
- Qian, H., Wang, B., Yuan, M., Gao, S., & Song, Y. (2022). Financial distress prediction using a corrected feature selection measure and gradient boosted decision tree. *Expert Systems with Applications*, 190, 116202.
- Samuel, A. L. (1959). Some studies in machine learning using the game of checkers. *IBM Journal of Research and Development*, 3(3), 210-229.
- Tsai, C. F., Hsu, Y. F., & Yen, D. C. (2014). A comparative study of classifier ensembles for bankruptcy prediction. *Applied Soft Computing*, 24, 977-984.
- Zhang, Z. (2016). Introduction to machine learning: k-nearest neighbors. *Annals of Translational Medicine*, 4(11), 213-229.
- Zmijewski, M. E. (1984). Methodological issues related to the estimation of financial distress prediction models. *Journal of Accounting Research*, 3(4), 59-82.

APPENDIX A: INDEPENDENT VARIABLES

BETA	PRICE TO BOOK RATIO	CASH TO TOTAL ASSETS
RETURN ON ASSET	QUICK RATIO	ASSETS GROWTH RATE
RETAINED EARNINGS TO TOTAL ASSETS	WORKING CAPITAL TO REVENUE	ACCOUNT RECEIVABLES TURNOVER

OPERATINGMARGIN RATIO	EQUITY TO TOTAL ASSETS	GROSSMARGINRATE
CURRENT RATIO	SALES GROWTH RATE	ACCOUNTSPAYABLETURNOVER
WORKING CAPITAL TO TOTAL ASSETS	CASH TO REVENUE	REVENUE TO COST OF GOODS SOLD
WORKING CAPITAL TO TOTAL LIABILITIES	CASH TO TOTAL LIABILITIES	REVENUE TO TOTAL ASSETS
MARKT VALUE OF EQUITY TO TOTAL LIABILITIES	BOOK VALUE PER SHARE	INVERTORY TO CURRENT ASSETS
OPERATING EXPENSES TO TOTAL ASSETS	EARNIGS PER SHARE	REVENUE TO EQUITY



DETERMINANTS OF INTERNAL FINANCING: SMALL AND MEDIUM ENTERPRISES IN PAKISTAN

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ABSTRACT

Purpose- Internal financing is an indicator of self-reliance, growth, and survival of a firm without help from external sources. It assesses the growth and survival of a firm without raising capital in equity or debt markets. This study identifies the determinants of internal financing.

Methodology- The study is based on six years of data from 398 companies in Pakistan, while panel least square (PLS) techniques have been applied to estimate the parameters. The conclusions have been derived through 12 mathematical equations

Findings- This study provides a device to assess the appropriate level of internal equities. From an investment policy point of view, lower return on investment discourages investment in small and medium enterprises.

Conclusion- The lower return on investment discourages investors from investing in small and medium enterprises. To compensate this effect, the study suggests the intervention by monetary and fiscal policy for the survival of small and medium enterprises (SMEs).

Keywords: Dividend, intangible assets, leverage financing, Pakistan, SMEs.

JEL Codes: G32, G35, M41

1. IMPORTANCE AND ISSUES OF SMALL AND MEDIUM ENTERPRISES (SMEs)

The firm's size in terms of its assets is a considerably important factor for the competitiveness, survival, and profitability of a business. Another important point in this respect is the composition of sources to finance the assets of a firm. The difference between assets and equity shows the size of leverage financing. How leverage financing affects the profitability and value of a firm is a debatable question in financial economics. This question becomes more important in the case of small and medium enterprises (SMEs) because of their limited ability to get financing at competitive prices. Another important concern belongs to the survival of small firms in a competitive environment where big organizations can get the benefits of scale economies. It is a common opinion that big organizations can use political influence in the formulation of economic policies in their favor, and sometimes those policies may damage the benefits of small and medium enterprises (SMEs).

However, the role of small and medium enterprises (SMEs) cannot be neglected because of their important contribution to economic activities. Their role in economic progress has been widely discussed in economic literature, and it is estimated that these enterprises contribute around 60 percent of total employment and 40 percent of Gross Domestic Product in the global economy. Their contribution to GDP is more than 60 percent in the case of the developing world (International Trade Centre: 2019). The share of SMEs in employment is 80 percent in Bangladesh, 90 percent in Indonesia, 35 percent in Malaysia, and more than 80 percent in Pakistan (OIC: 2008). Their share in exports is 20 percent in Malaysia, 70 percent in Bangladesh, 30 percent in Jordan, 30 percent in Turkey, and 80 percent in Pakistan. (OIC: 2008). Another study (World Bank: 2017) has estimated that there are more than 365 million Small and Medium Enterprises (SMEs) in emerging markets. Out of those, more than 285 million are informal enterprises. While 25 million are formal SMEs and 55 million are formal micro-enterprises. The conversion of informal SMEs into the formal sector can ensure better access to credit, government facilitation, implementation of regulations, and higher contribution to the national exchequer.

The role of SMEs becomes more important in developing and emerging economies, where the roles of large corporations and capital-intensive industries are lesser than those of industrialized countries. The SMEs in developing countries serve as the engine

of economic growth. They provide sizeable subsidiary services and economic activities. In emerging markets, more than 80 percent of formal jobs are created by SMEs. According to World Bank (2018) estimates, 600 million jobs will be required in the next 15 years to absorb the growing global workforce. To cater to this requirement, emerging economies will have to depend on SMEs. Another important role of SMEs, which has been discussed in economic literature, is that they reduce poverty and income disparities through trickle-down effects by generating participation and employment opportunities. In this way, they develop the entrepreneurial culture in the economy.

Despite the economic and social importance of small and medium enterprises (SMEs), their survival and perpetual expansion is an important area of concern. These enterprises cannot get those benefits in financial markets that are available to large-scale firms. Due to their goodwill, reputation, and financial and administrative ability to fulfill compliance and regulatory requirements, large firms can expand their size by generating equity and debts in capital markets. Their ability to borrow from financial institutions is always higher than that of small and medium enterprises. These benefits are transformed into lower costs of their capital, while small firms have to pay higher costs of capital. In most cases, small firms have to face difficulties in getting external finances at affordable cost. Similarly, the lower earnings lead to lower corporate savings (internal equities). This situation restricts the expansion of business. Despite lower profits, they have to enhance their internal equities at the cost of dividend payments to their shareholders. Consequently, the return on investment may be lower in small and medium enterprises as compared to large-scale enterprises.

The expansion of the capital base becomes a primary requirement for growth and survival in the competitive environment, where large and well-established companies have several advantages over small entities. The established connection with the market, experienced staff, familiarity with the regulations, and economies of scale are those advantages that are available to large and well-established companies, while enhancement in capital base is the primary requirement for the survival and growth of new and small entities.

Small and medium enterprises (SMEs) are less likely to obtain bank loans than large companies. The complexities in capital raising through market mechanisms, difficulties in short-term financing, unfavorable government regulations, problems in marketing and image building, deficiency in human resources, lack of harmonization and vertical integration with large-scale enterprises, and lack of technological advancement are common issues that are faced by small and medium enterprises. The issues become more complicated when a small company introduces a new product or service in the market. Large companies may adopt this idea and can offer similar products or services in a better way. The enhancement in the capital base is required to get competitive advantages. Erin (2014) has indicated that in the case of viable startups, these companies are acquired by large companies. The acquisition of small companies by large companies creates unemployment for the workers of small enterprises.

About 50 percent of formal SMEs don't have access to formal credit. The financing gap is even larger in micro and informal enterprises. About 70 percent of micro, small, and medium enterprises (MSMEs) in emerging markets do not have access to credit. This gap is much wider in Africa and Asia. Naoyuki and Farhad (2019) have identified some difficulties of SMEs in accessing finance and suggested to mitigate these challenges. They provided a mechanism to ease the access of SMEs to finance. They suggested several ways to address the financial issues of SMEs. To develop credit information infrastructure, improve credit guarantee schemes, and proper utilization of credit rating techniques are included in the suggested measures.

In these circumstances, small and medium enterprises (SMEs) have to rely on internal financing. Internal financing is created through the retention of profits for expansion in owners' equity. For small and medium enterprises, it is easier to create internal equities by retaining profits because of steady and frictionless approval from the corporate board.

Another important aspect of this discussion is that the quantum of internal financing implies the quantum of an organization's share in earnings. It is quite obvious that internal financing is used for expansion, which reflects less reliance on external sources: equity and debt. It assesses the growth and survival of a firm without raising capital in equity or debt markets. This is a neglected area in economic literature. This study fills this gap. Determining the organization's share in income is the core area of this study.

The study has been divided into five sections. The next section discusses the views of economists and experts on the role of external financing. This section summarizes the previous studies on the role of leverage financing. The research methodology to identify the factors of internal equities has been explained in section 3. This section establishes a model to estimate the internal equities (surplus and reserves), payment of bonus shares, and retained earnings for a certain year. It describes the factors that contribute to the reserves and surplus, payment of bonus shares, and retained earnings for a certain year. The suggested methodology differentiates between the impacts of large business units and small and medium enterprises. The results and conclusions have been explained in section 4. Finally, section 5 recommends some policy measures based on the empirical evidence in this study.

2. LITERATURE REVIEW: FIRM SIZE AND FINANCING

Substantial, plentiful, and rich studies on the role of leverage financing are available in the literature of financial economics. Fairly a large number of studies have discussed the effects of debt financing on the profitability and value of a firm (Gordon: 1962a, Myers and Majluf: 1984, Miller and Modigliani: 1958, Miller and McConnell: 1995, Shleifer and Vishny: 1986, Glen and Pinto: 1994, and Harriss and Raviv: 1991). Several aspects of debt financing have been covered in these studies. Miller and Modigliani (1958) have covered the consequences of changes in the magnitude of the debt-equity combination. The debt about the risk of default has also been covered in these studies. Several studies have identified the factors of equities' prices and firm's value. Myers (1989), Myers and Majluf (1984), and Miller and Modigliani (1958) have explained how debt financing affects the profitability and value of a firm. In another study, Miller (1977) concluded that the debt-equity ratio becomes irrelevant in the absence of corporate taxes. So, it is the fiscal policy or tax rates that differentiate the effect of debt-equity ratios on a firm's value. The impacts of monetary policy on firm valuation have also been discussed broadly by Miller and Modigliani (1961), Gordon (1962a), Miller (1982), Mehar (2001) and Mehar (2021). Miller and Modigliani (1961), Gordon (1962b), Sharpe (1964), Linter (1965), and Miller (1982) have explained the role of dividend policy in a firm's valuation.

The factors of debt financing have also been analyzed in the literature by several dimensions. The studies on the determinants of debt financing (Miller: 1982, Mehar: 2007 and Fischer and Merton: 1984) have identified interest rates, access to the credit market, size of the firm, and sales revenue as factors of debt financing. Some studies have pointed out that corporate governance plays a significant role in debt financing. Fama and Jensen (1983), Grossman and Hart (1983), and Jensen, Solberg, and Zorn (1992) are included in these studies, which discuss debt financing from the governance point of view. These studies recognize the role of institutional investment, the size and structure of the corporate board, the regulatory environment, and the industry's characteristics in debt financing. The role of insiders and governance in debt financing has been widely covered in these studies under the implications of agency theory. Similarly, the pecking order theory establishes the relations between types of assets and sources of financing. The pecking order theory categorizes financing into three major classes: Equity financing, long-term debt, and short-term debt. Equity is further classified into paid-up capital and retained earnings. According to this theory, the preferable source of financing may be varied for working capital, intangible assets, and fixed assets.

Despite all these issues and complications, it is very interesting in the South Asian context that the majority of investors prefer to establish their own business or launch a small or medium enterprise instead of participating in a large corporation. This tendency promotes family ownership of companies. Singh and Hamid (1992) and Singh (1995) have reported these trends in South Asian countries. One of the major reasons behind this tendency is receiving those monetary and non-monetary benefits that are associated with the directorship of companies. Enjoying administrative powers, accommodating their family members and relatives in the employment of the company, drawing non-salary monetary benefits, and participating in social and political gatherings as owners or directors of an enterprise are included in the incentives that induce small investors to establish their own business (Mehar: 2005b, Mehar: 2005c). The retention of profits and creating internal equities is easier in the case of family-owned enterprises because of steady and frictionless approval from the corporate board.

Despite a large number of studies on debt financing, internal financing is a relatively neglected area in corporate finance. The identification of the factors of internal financing has not been discussed in detail in financial literature. Retained earnings are the profits of entrepreneurs. In accounting and finance, the 'Entrepreneur' is recognized as a separate entity from owners, while retained earnings are the only part of income that remains with the entrepreneur. The long-term debt and shareholders' equity are part of employed capital. The payment of dividends to shareholders and interest on debts are considered as income of capital. So, undistributed profit is the only income that is retained with the firm, and in fact, it is the profit of the entrepreneur.

The previous studies in economic literature have discussed the role of leverage financing, the size of the firm, and the types of investors on the profitability and value of the firm. Identifying the factors of internal financing is a relatively ignored area in the literature. In the contemporary world, a firm is considered a separate entity from its owners or shareholders. To finance the growth in assets through internal sources indicates less dependency on external capital: increase in shares' capital or debt financing. In this background, it is important to discuss the determinants of internal financing. This study is mainly concerned with identifying the factors of enhancement in internal equities. The internal equities are defined as 'Accumulated retained earnings' or 'Surplus and Reserves' in financial accounting. These are the residual part of profits that have not been distributed to the shareholders for several reasons, including expansion plans for the future and contingencies. This study also differentiates the patterns of dividend payments between small and large size companies.

3. DETERMINANTS OF INTERNAL FINANCING: DATA AND RESEARCH METHODOLOGY

It has been mentioned in the earlier sections that this study is mainly concerned with the determinants of internal financing of companies. Internal financing is defined as internal equities which are created by the companies from earnings after tax. Internal equities are the residual earnings after the payment of cash dividends (DVDND) to the shareholders. These residual earnings are used for payment of bonus shares (BNUS) and for forming various types of reserves and surplus funds (SURPLUS). The reserves and surplus funds are the accumulated retained earnings in the balance sheet of a company at the end of the year. These are residual profits that have not been paid to the shareholders in cash or bonus shares. The residual profits after payment of dividends as a percentage of earnings after tax is defined as the retention ratio (RTNR). The higher retention ratio (RTNR) means lower payment of dividends. The reserves and surplus funds (SURPLUS), retained earnings (RE), and dividend payout (PAYOUT) can be defined in the following expressions:

$$SURPLUS_{it} = RE_{i(t-1)} + RE_{it} \tag{1}$$

$$While, RTNR_{it} = (EAT_{it} - DVDND_{it}) / EAT_{it} \tag{2}$$

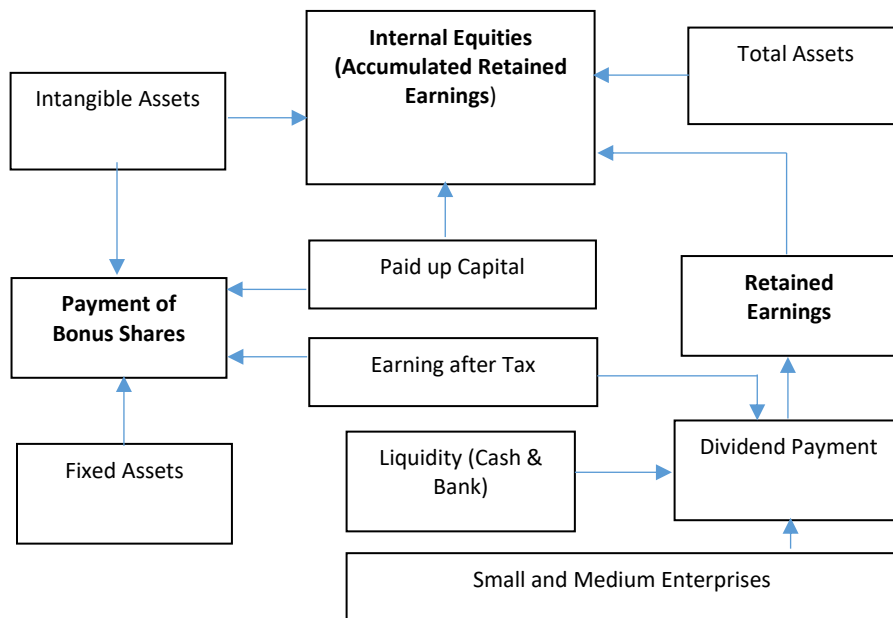
$$PAYOUT_{it} = PAYOUT_{it} / EAT_{it} \tag{3}$$

$$So, RTNR_{it} = 1 - PAYOUT_{it} \tag{4}$$

Where ‘SURPLUS_{it}’ is the reserve and surplus funds of company ‘i’ in year ‘t’, which have been created by accumulated retained earnings. ‘RE_{it}’ is retained earnings of company ‘i’ in year ‘t’, ‘RE_{i(t-1)}’ is retained earnings of company ‘i’ at the end of last year ‘t-1’, ‘RTNR_{it}’ is the retention ratio of company ‘i’ in year ‘t’, ‘EAT_{it}’ is earning after tax of company ‘i’ in year ‘t’, ‘DVDND_{it}’ is the payment of dividend to the shareholders of company ‘i’ in year ‘t’, and ‘PAYOUT_{it}’ is a payout ratio of company ‘i’ in year ‘t’.

The size of a firm (TOTAST), internal equities (SURPLUS), and payment of bonus shares (BNUS) are mutually determined variables. Their simultaneity has been shown in Figure 1, while the reasoning of these relationships has been explained in the subsequent paragraphs.

Figure 1: Determinants of Internal Financing



The retention ratio (RTNTR) accumulated retained earnings (SURPLUS), and payment of bonus shares (BNUS) are indicators of internal financing. These indicators have been estimated through an empirical model consisting of 3 equations. These three equations explain the impacts of explanatory factors on accumulated retained earnings (SURPLUS), payment of bonus shares (BNUS), and dividend payout ratio (PAYOUT) in the following expression:

$$SURPLUS_{it} = \beta PAIDUP_{it} + \gamma INTNGBL_{it} + \Omega TOTAST_{it} + \delta X_{it} + \mu_i + \tau_t + \epsilon_{it} \quad (5)$$

$$BNUS_{it} = \beta PAIDUP_{it} + \gamma INTNGBL_{it} + \Omega FXDAST_{it} + \delta X_{it} + \mu_i + \tau_t + \epsilon_{it} \quad (6)$$

$$PAYOUT_{it} = \beta CASH/EAT_{it} + \gamma SME_i + \delta X_{it} + \mu_i + \tau_t + \epsilon_{it} \quad (7)$$

Where 'PAIDUP_{it}' is paid up capital of company 'i' in year 't', 'INTNGBL_{it}' is intangible assets of company 'i' in year 't', 'TOTAST_{it}' is total assets of company 'i' in year 't' and 'FXDAST_{it}' is fixed assets of company 'i' in year 't'. 'CASH_{it}' indicates the cash and bank balance of company 'i' in year 't', while 'SME_i' is a dummy variable equal to '1' if a company 'i' is classified as a small or medium enterprise. 'X_{it}' is a vector of exogenous control variables; 'μ_i' denotes unobserved time-invariant heterogeneity at the company level; 'τ_t' is a company-fixed effect; and 'ε_{ijt}' is an independent disturbance term.

Several control variables to estimate the net effects of the size of a company (TOTAST), paid-up capital (PAIDUP), and liquidity position (CASH/EAT) on reserves and surplus funds (SUPLUS), payment of bonus shares (BNUS) and dividend payout ratio (PAYOUT) have been included in the estimations. For estimation purposes, the above-mentioned expressions have been transformed in the following equations:

$$SURPLUS_{it} = \alpha_i + \beta_1 PAIDUP_{it} + \beta_2 INTNGBL_{it} + \beta_3 TOTAST_{it} + \epsilon_{it} \quad (8)$$

$$BNUS_{it} = \alpha_i + \beta_1 PAIDUP_{it} + \beta_2 INTNGBL_{it} + \beta_3 FXDAST_{it} + \epsilon_{it} \quad (9)$$

$$PAYOUT_{it} = \alpha_i + \beta_1 (CASH/EAT)_{it} + \beta_2 SME_i + \epsilon_{it} \quad (10)$$

Equation 8 determines the causes of accumulated retained earnings. These retained earnings are mentioned as reserves and surplus (SURPLUS) in companies' financial statements. Equation 9 explains the factors of the payment of bonus shares (BNUS) to the shareholders. The distribution of bonus shares (BNUS) to the existing shareholders indicates the utilization of profit for enhancing paid-up capital (PAIDUP) to finance the assets of a company (TOTAST). The size of a company in this study is defined by the magnitude of total assets (TOTAST). The bonus shares (BNUS) may be a cause of dilution in earnings per share in forthcoming years. Equation 10 estimates the payout ratio (PAYOUT). A payout ratio (PAYOUT) shows the payment of dividends to shareholders as a percentage of earnings after tax. There is an inverse relation between the retention ratio (RTNR) and payout ratio (PAYOUT). So, a higher payout ratio (PAYOUT) indicates a lower retention ratio (RTNR), while the lower dividend payment (DND) may affect the shares' prices adversely.

The above-mentioned equation (8) explains the impacts of explanatory factors on accumulated retained earnings (SURPLUS). The effects of paid-up capital (PAIDUP), total assets (TOTAST), and intangible assets (INTNGBL) on accumulated retained earnings (SURPLUS) have been tested through this equation. The positive effects of total assets (TOTAST) and paid-up capital (PAIDUP) imply that large-size companies are more likely to expand their business through internal financing. It is hypothesized that companies that have more intangible assets (patents, copyrights, goodwill trademarks, etc.) cannot retain a large part of their earnings because of the cost of amortization of these assets. The cost of intangible (INTNGBL) assets is usually charged as rental of these assets. It may be reimbursed in installments, which adversely affect the profitability of the companies.

The effects of small and medium enterprises (SME) on accumulated retained earnings (SURPLUS) have been tested through a dummy variable (SME), which is equal to '1' if a company is categorized as a small or medium enterprise according to the Small and Medium Enterprises Authority's definition (Government of Pakistan: 2021). This definition is not based on the size of a company in terms of its total assets (TOTAST). According to the Small and Medium Enterprises Authority, a company will be classified as a small or medium enterprise if its annual sales revenue is less than Rs.800 million. This categorization is based on the latest SME policy formulated by the Government of Pakistan (2021). A small or medium enterprise can avail those benefits which are available to small and medium enterprises in Pakistan. The lower interest rate on borrowing from commercial banks, flexibility in listing and regulatory requirements, and special facilitation by the Small and Medium Enterprises Authority (SMEDA) are included in these benefits. To capture the effect of this policy, the above-mentioned dummy variable (SME) has been created.

The equation: 9 estimates the payment of bonus shares (BNUS) to the shareholders of company 'i' in year 't'. The paid-up capital (PAIDUP) of company 'i' in year 't', intangible assets (INTNGBLE) of company 'i' in year 't', fixed assets (FXDAST) of company 'i' in

year 't', and earnings after tax (EAT) of company 'i' in year 't' have been taken as explanatory variables. The dummy variable to capture the effect of the special status of small and medium enterprises (SMEs) has also been introduced in this equation.

To estimate the retained earnings (RE) of company 'i' in year 't', an indirect approach has been adopted in this study. The retention ratio (RTNR) of company 'i' in year 't' indicates how much profit of company 'i' in year 't' was retained by the company. The retention ratio (RTNR) is inversely proportionate to the payout ratio (PAYOUT), while the payout ratio (PAYOUT) describes how much profit was distributed in dividends (DVDND) or bonus shares (BNUS). Through equation 3, this study identifies the determinants of payout ratio (PAYOUT). This equation determines the dividend policy of a firm.

The dividend payout ratio (PAYOUT) has been taken as an indicator of dividend policy in this study. We have considered that the liquidity position of a firm is a determinant of the payout ratio (PAYOUT). The ratio of cash and bank balance (CASH) at the end of the year to earnings after tax (EAT) for the year has been taken as an indicator of the liquidity position of firm 'i' in year 't'. A positive association between the payout ratio (PAYOY) and cash-to-earnings ratio (CASH/EAT) was assumed. In simple words, the availability of sufficient cash (CASH) can improve the payment of dividends (DVDND). A lower payout ratio (PAYOUT) of small and medium enterprises (SMEs) was also expected. Because of lower paid-up capital and difficulties in borrowing, small and medium enterprises have to rely on retained earnings (RE) for their expansion. So, their payout ratio (PAYOUT) will be lower.

Mehtar (2005a) and Mehtar (2022) have noted that the majority of large-scale units in Pakistan are engaged in the production of industrial raw materials and intermediate goods, while small and medium enterprises (SMEs) convert these intermediate goods into finished products. So, small and medium enterprises (SMEs) have to invest their capital in inventories and trade credits. The lower balance of cash (CASH) in small and medium enterprises (SMEs) reflects this phenomenon. The payment of dividends (DVDND) is affected by the lower balance of cash (CASH).

Two dummy variables to capture the sector-specific effects of companies in information and communication (ICT) and services sectors (SRV) have been included in the above-mentioned equations. To test the macroeconomic factors, the rate of inflation (INFLCPI) and domestic credit to the private sector as a percentage of GDP (DCPS) have also been considered as explanatory factors. Transparency, accountability and corruption in the public sector (CRPTN) and the rule of law (LAW) have also been considered in the determination of the dividend policy.

The above-mentioned equations show the direct effects of the size and liquidity position of a firm on internal financing, while the indirect effects of the size and liquidity position can be expressed as follows:

$$\frac{\partial SURPLUS}{\partial \left(\frac{CASH}{EAT}\right)} = 1 - \frac{\partial PAYOUT}{\partial \left(\frac{CASH}{EAT}\right)} \quad (11)$$

$$\frac{\partial SURPLUS}{\partial SME} = 1 - \frac{\partial PAYOUT}{\partial SME} \quad (12)$$

The firm-level data was required to analyze the factors of internal financing. The 6-year data of 398 listed companies of Pakistan have been extracted from their annual reports (SBP: 2023). Table 1 shows the classification of those companies. However, 324 out of those 398 companies have been included in the analysis because of consistency and availability of required data. The data for some variables are not available in some cases. The number of observations for each regression has been reported in the results. All data has been reported in thousand rupees (PKR) unless specified.

The reported data in annual accounts are based on standard accounting policies and procedures. The definitions of some variables in accounting procedures are different from those in finance theory. So, before applying the statistical techniques for empirical analysis, some variables have been re-calculated. In this analysis, preference shares capital is not a part of owners' equity (EQ). Similarly, the surplus on the revolution of assets is not included in accumulated retained earnings (SURPLUS). In financial statements of companies, total assets (TOTAS) will be slightly greater than current assets (CURAST) plus fixed assets (FXDAST) because of the inclusion of those non-current assets that cannot be treated as fixed operating assets (FXDAST). The intangible assets (INTNGBL) are those assets that have been taken separately from fixed operating assets (FXDAST). The descriptions of variables and sources of data have been shown in Table 2.

Panel least square (PLS) techniques have been applied to estimate the parameters. The Hausman (Cross-sectional random chi-square) and Lagrange Multiplier (Breusch-Pagan, Honda, King-Wu) tests have been applied to test the appropriateness of panel least square (PLS) techniques. Based on these criteria, the fixed effect models have been used for the estimation of accumulated retained earnings (SURPLUS), while the common effect model was suggested for the estimation of bonus shares (BNUS) and dividend payout ratio (PAYOUT). To test the robustness of parameters, every equation has been estimated in 3 alternative scenarios. To select the appropriate model, the Akaike, Schwarz, and Hannan-Quinn information criteria have also been reported.

These criteria suggest the most appropriate models to minimize information losses. The estimated parameters have been presented in Tables 4 to 6.

Table 1: Companies in Sample (Year: 2016-21)

Sector	No. of Companies
Manufacturing, processing, and trading of goods	371
Information, communication, and transport services	16
Other services activities	11
Total	398
Small and medium enterprises (SMEs)	116

Table 2: Descriptive Statistics: Financial and Operational Indicators (Million PKR unless specified)

Variable	Large Scale Companies			Small and Medium Enterprises		
	Mean	Median	Standard Error	Mean	Median	Standard Error
Bonus shares	194.3	29.3	58.4	48.1	13.2	15.0
Cash and bank balance	758.6	62.8	86.1	124.1	9.8	19.4
Current assets	9276.4	1605.2	985.6	1557.9	249.1	243.0
Dividend paid	831.1	68.9	95.3	219.1	17.7	39.1
Earning after tax	1024.1	96.7	213.8	256.8	2.6	117.1
Fixed Assets at cost	9461.7	1754.7	862.4	2186.9	422.6	245.2
Intangible assets	482.6	6.4	90.9	71.3	2.9	22.9
Leverage Ratio	2.3	2.2	0.4	1.6	1.9	0.6
Operating assets at cost	10762.2	2258.3	1045.2	2408.0	443.4	245.3
Paid up capital	1582.1	122.7	173.6	469.2	28.7	85.0
Payables	5576.7	553.1	731.4	654.1	122.3	99.7
Reserves and surplus	7238.9	761.8	1389.1	715.1	38.8	146.4
Total assets	21653.6	3453.1	2231.7	4626.8	569.5	1041.2

Table 3: List of Variables and Sources of Data

Abbreviation	Description	Source
BNUS	Issuance of bonus shares or stock dividends	Financial Statement Analysis; State Bank of Pakistan/ Pakistan Stock Exchange (2023)
CASH	Cash and bank balance	Financial Statement Analysis; State Bank of Pakistan/ Pakistan Stock Exchange (2023)
CRPTN	Transparency, accountability and corruption in the public sector index (in units of standard normal distribution, ranging from approximately -2.5 to 2.5)	Worldwide Governance Indicator; World Bank (2022)
DCPS	Domestic credit to private sector as % of GDP	International Financial Statistics, International Monetary Fund (2023)
EAT	Earning after tax	Financial Statement Analysis; State Bank of Pakistan/ Pakistan Stock Exchange (2023)
FXDAST	Fixed assets at cost	Financial Statement Analysis; State Bank of Pakistan/ Pakistan Stock Exchange (2023)
ICT	The dummy variable equal to '1' if a company belongs to information and communication technology and '0' otherwise	Author's depiction based on State Bank of Pakistan (2023)
INFLCPI	Rate of inflation based on consumer prices (annual %)	World Development Indicators; World Bank (2023)
INTNGBL	Intangible assets that cannot be seen, touched, or physically measured. These are created through time and/or effort. Copyrights, patents, goodwill, trademarks, and software accounts are included in these assets.	Financial Statement Analysis; State Bank of Pakistan/ Pakistan Stock Exchange (2023)

LAW	Rule of law index (in units of a standard normal distribution, ranging from approximately -2.5 to 2.5)	Worldwide Governance Indicator; World Bank (2022)
LVRG	Leverage ratio: Ratio of total assets to shareholder's equity	Author's calculations
OPRSTC	Operating fixed assets at cost	Financial Statement Analysis; State Bank of Pakistan/ Pakistan Stock Exchange (2023)
PAIDUP	Paid-up capital (Ordinary shares capital)	Financial Statement Analysis; State Bank of Pakistan/ Pakistan Stock Exchange (2023)
PAYBLS	Trade credit and other accounts payables	Financial Statement Analysis; State Bank of Pakistan/ Pakistan Stock Exchange (2023)
PAYOUT	Cash dividend to earning after tax	Author's calculations
RTRNR	Retained earnings to earning after tax	Author's calculations
SME	The dummy variable is equal to '1' if the annual sales revenue of the company is less than Rs.800 million, and '0' otherwise.	Author's depiction based on the Government of Pakistan (2021)
SRV	The dummy variable equal to '1' if a company belongs to the services sector and '0' otherwise	Author's depiction based on State Bank of Pakistan (2023)
SURPLUS	Accumulated retained earnings (Reserves and surplus)	Financial Statement Analysis; State Bank of Pakistan/ Pakistan Stock Exchange (2023)
TOTAST	Total Assets (Equity and Liabilities)	Financial Statement Analysis; State Bank of Pakistan/ Pakistan Stock Exchange (2023)

4. RESULTS AND CONCLUSION

Tables 4 to 6 show estimated quantifications of the impacts of explanatory variables on accumulated retained earnings (SURPLUS), issuance of bonus shares (BNUS), and dividend payout ratio (PAYOUT). These results are based on panel least square (PLS) techniques, while estimated parameters of Hausman tests, Lagrange multipliers, and information criteria have also been reported in these tables. The results show the significance of parameters and overall goodness of fit. However, some results are against the common intuition. For instance, the impact of small and medium enterprises (SME) is not significant in the determination of accumulated retained earnings (SURPLUS) and payment of bonus shares (BNUS), though it is a significant determinant of the dividend payout ratio (PAYOUT).

The robustness of estimated parameters has been checked by using three alternative options. For this purpose, some control variables have been added to the regression analysis. The robust and significant impacts of paid-up capital (PAIDUP), total assets (TOTAST), fixed assets (FXDAST), intangible assets (INTNGBL), earning after tax (EAT), and cash balance at the end of the year (CASH) have been noted.

The empirical evidence in this study shows that the magnitude of internal financing is largely determined by the nature and size of assets: Total assets (TOTAST), fixed assets (FXDAST), intangible assets (INTNGBL), and paid-up capital (PAIDUP). According to the statistical evidence, paid-up capital (PAIDUP) and fixed assets play an important and significant role in creating internal equities. The firms with higher paid-up capital (PAIDUP) and assets (TOTAST or FXDAST) will retain more profits. These firms will issue more bonus shares (BNUS) to expand their paid-up capital (PAIDUP). However, intangible assets (INTNGBL) will affect accumulated retained earnings (SURPLUS) and payment of bonus shares (BNUS) negatively. These results are confirmed by three alternative scenarios.

In interpreting the negative impact of the small and medium enterprises' (SME) on dividend payout ratio (PAYOUT), it is notable that the Small and Medium Enterprises Development Authority (SMEDA) provides very limited facilitation to the small and medium enterprises (SMEs). Such facilitations do not help generate the capital at a competitive and affordable cost. Large corporations can issue new equities and debt instruments and can arrange institutional financing. However, small and medium enterprises (SMEs) have to retain their profits to enhance their equities for expansion in their assets (TOTAST). It is also notable that small and medium enterprises (SMEs) have been defined based on sales revenue. It corroborates that dividend policy cannot be independent of the size of the business. Because of reliance on internal equities, small and medium enterprises (SMEs) have to retain their profits. The expected rate of return on investment in small-size firms will be lower than in large corporations. Consequently, their shareholders may have to face lower market value of their assets. This situation creates a bias against the small firms. This is one of the barriers to the growth and survival of small and medium enterprises (SMEs).

Table 4: Dependent Variable: Accumulated retained earnings (SURPLUS)

Independent Variable/ Option	I	II	III
Constant	3263639.0** (2.305)	3118552.0** (2.161)	3276632.0** (2.300)
INTNGBL: Intangible assets	-2.624*** (-3.260)	-2.630*** (-3.246)	-2.629*** (-3.254)
TOTAST: Total Assets	0.084*** (4.409)	0.086*** (4.476)	0.085*** (4.262)
PAIDUP: Paid-up capital	1.281** (2.080)	1.292** (2.084)	1.282** (2.079)
SME: Dummy variable equal to '1' for SMEs	-1557704.0 (-0.703)	483362.4 (0.195)	-1556299.0 (-0.686)
SME*ICT: Dummy variable for SMEs *Dummy variable for companies in ICT	56946.3 (0.007)	-817014.3 (-0.103)	39960.8 (0.005)
SME*SRV: Dummy variable for SMEs *Dummy variable for companies in the services industry		-2.528* (-1.944)	-77374.7 (-0.007)
LVRG: Leverage ratio			-10436.3 (-0.094)
Overall Significance			
R-squared	0.569	0.571	0.569
Adjusted R-squared	0.457	0.458	0.455
F-statistic	5.081	5.065	5.008
Criteria for Model Selection			
Akaike information criterion	36.864	36.877	36.868
Schwarz criterion	37.846	37.866	37.862
Hannan-Quinn criterion	37.240	37.256	37.249
Testing for Fixed/ Random/ Common Effect			
Lagrange Multiplier Test: Breusch-Pagan	205.720***	205.737***	200.616***
Lagrange Multiplier Test: Honda	14.3429***	14.343***	14.163***
Lagrange Multiplier Test: King-Wu	14.34297***	14.343***	14.163***
Hausman Test (Cross-section random Chi-Square)	50.529***	57.763***	57.763***
#T-Statistics in parenthesis *p < 0.1; **p < 0.05; ***p < 0.01			

Method: Panel Least Squares (Fixed Effect Model), Sample: 2016-2021, Periods included: 6; Cross-sections included: 173; Total panel (unbalanced) observations: 855

Table 5: Dependent Variable: Issuance of bonus shares or stock dividends (BNUS)

Independent Variable/ Option	I	II	III
Constant	22454.8 (0.969)	515477.3 (1.096)	9775.9 (0.354)
INTNGBL: Intangible assets	-0.029*** (-3.398)	-0.029*** (-3.520)	-0.043*** (-5.233)
FXDAST: Fixed assets at cost	0.006*** (3.017)	0.006*** (3.037)	
OPRASC: Operating fixed assets at cost			0.003 (1.251)
PAIDUP: Paid-up capital	0.061*** (5.231)	0.061*** (5.334)	0.081*** (8.099)
EAT: Earning after tax	0.026*** (5.142)	0.026*** (5.165)	0.034*** (8.186)
SME: Dummy variable equal to '1' for SMEs	-31079.7 (-0.779)	-22473.8 (-0.599)	-9841.6 (-0.252)

SME*ICT: Dummy variable for SMEs*Dummy variables for companies in ICT	59289.0 (0.663)		
SME*SRV: Dummy variable for SMEs* Dummy variable for companies in the services industry	108493.0 (0.946)		
DCPS: Domestic credit to private sector as % of GDP		-31365.7 (-1.050)	
Overall Significance			
R-squared	0.884	0.884	0.875
Adjusted R-squared	0.876	0.877	0.869
F-statistic	116.480	136.986	152.845
Criteria for Model Selection			
Akaike information criterion	27.171	27.155	27.210
Schwarz criterion	27.362	27.322	27.353
Hannan-Quinn criterion	27.249	27.223	27.268
Testing for Fixed/ Random/ Common Effect			
Lagrange Multiplier Test: Breusch-Pagan	0.022	0.015	0.408
Lagrange Multiplier Test: Honda	-0.147	-0.122	0.639
Lagrange Multiplier Test: King-Wu	-0.147	-0.122	0.639
#T-Statistics in parenthesis *p < 0.1; **p < 0.05; ***p < 0.01			

Method: Panel Least Squares (Common Effect Model), Sample: 2016-2021, Periods included: 6; Cross-sections included: 57; Total panel (unbalanced) observations: 116

Table 6: Dependent Variable: Payout Ratio (PAYOUT)

Independent Variable/ Option	I	II	III
Constant	3.804** (2.094)	-18.353 (-0.910)	19.363 (0.523)
SME: Dummy variable equal to '1' for SMEs	-7.817** (-2.340)	-7.995** (-2.398)	-7.696** (-2.295)
CASH/EAT: Cash to Earing after tax	0.283*** (8.204)	0.283*** (8.223)	0.283*** (8.213)
PAYBLS/EAT: Trade credit and other accounts payables to Earing after tax	0.002 (1.097)	0.002 (1.039)	0.002 (1.083)
INFLCPI: Rate of inflation based on consumer prices		-0.771 (-1.323)	-1.189* (-1.944)
LAW: Rule of law index		-37.697 (-1.427)	
CRPTN: Transparency, accountability and corruption in the public sector index			11.260 (0.261)
TOTAST: Total Assets			1.38E-08 (0.640)
Overall Significance			
R-squared	0.100	0.105	0.104
Adjusted R-squared	0.097	0.101	0.098
F-statistic	35.181	22.439	18.389
Criteria for Model Selection			
Akaike information criterion	10.541	10.539	10.543
Schwarz criterion	10.562	10.569	10.578
Hannan-Quinn criterion	10.549	10.551	10.556
Testing for Fixed/ Random/ Common Effect			
Lagrange Multiplier Test: Breusch-Pagan	0.225	0.185	0.199
Lagrange Multiplier Test: Honda	-0.474	-0.430	-0.446

Lagrange Multiplier Test: King-Wu	-0.474	-0.430	-0.446
#T-Statistics in parenthesis			
*p < 0.1; **p < 0.05; ***p < 0.01			

Method: Panel Least Squares (Common Effect Model), Sample: 2016-2021, Periods included: 6; Cross-sections included: 236; Total panel (unbalanced) observations: 972

5. POLICY IMPLICATIONS AND LIMITATIONS

It is important that internal financing is an indicator of self-reliance, growth, and survival of a firm without help from external sources. However, internal financing may be a cause of lower dividends, which may discourage investors. This study provides a device to assess the appropriate level of internal financing.

From an investment policy point of view, small and medium enterprises (SMEs) must pay lesser dividends as compared to large enterprises. It has been discussed that small and medium enterprises (SMEs) play an important role in improving financial liquidity in the market. They help the large-scale units by purchasing their products in cash while they supply these products to the consumers on credit. They manage the inventories and storage facilities for these products. These enterprises work as corresponding parts of the big corporations. So, the existence of small and medium enterprises is important for large-scale industries. The lower return on investment discourages investors from investing in small and medium enterprises. Monetary and fiscal policy intervention is required for the survival of small and medium enterprises (SMEs). The exemption and rebate on dividend income from small and medium enterprises may be the right option.

Because of their large contribution to the economy, small and medium enterprises (SMEs) cannot be neglected in economic policies. One of the possibilities to remove the bias against small and medium enterprises is to provide financing for expansion to the small and medium enterprises (SMEs) through a different window. The specialized financial institutions for SMEs can provide financing facilities to SMEs at a lower rate of interest and different criteria for financing.

There are some limitations of this study. The statistical results of this study are based on the data of companies in Pakistan. Before generalizing the conclusion, it will be better to examine these empirical relations in the larger context. The study must be expanded and enhanced in the larger context. Due to constraints of data, the effects of fiscal policies, including tax rates and subsidies, are not covered in this research. The insufficient panel data in the context of Pakistan cannot identify the net effects of the COVID-19 pandemic. Though earnings after tax capture the effect of COVID-19. The study determines the effects of liquidity and earnings on dividend payout. It is a common opinion that a higher payout can affect the employees' benefits adversely. Testing this intuition can be an interesting area for future studies. It has been referred to in this study that small and medium enterprises (SMEs) play an important role by investing in working capital, while large-scale units focus on investment in fixed assets. This linkage between small and medium enterprises (SMEs) and large-scale units may be tested in future studies.

REFERENCES

- Harris, M., & Raviv, A. (1991). The theory of capital structure. *Journal of Finance*, 46, 297–355.
- International Trade Centre. (2019). *SME Competitiveness Outlook 2019: Big Money for Small Business – Financing the Sustainable Development Goals*. Geneva: ITC (2019).
- Jensen, G., Solberg, S. P., & Zorn, T. S. (1992). Simultaneous determination of insider ownership, debt, and dividend policies. *Journal of Financial and Quantitative Analysis*, 27(2), 247–263.
- Mehtar, M. Ayub (2005a). Financial repercussion of cost, revenue, and profit: an extension in the BEP and CVP analysis. *Applied Financial Economics*, 15, 259–271.
- Mehtar, M. Ayub (2001). Macroeconomic determinants of market capitalization and valuation ratio: the case of the Karachi Stock Exchange. *Pakistan Business Review*, 3(3), 1-14.
- Mehtar, M. Ayub (2005b). Is debt a substitute of equity? Relevancy of financial policy in current economic scenarios. *Applied Financial Economics*, 15, 337–366.
- Mehtar, M. Ayub (2005c). Simultaneous Determination of Inventories and Accounts Receivable. *Managerial and Decision Economics*, 26(1), 259-269.
- Mehtar, M. Ayub (2007). World textile in free trade regime. *Journal of the Textile Institute*, 98(2), 177-188.
- Mehtar, M. Ayub (2021). Bridge financing during COVID-19 Pandemics: Nexus of FDI, external borrowing and fiscal policy. *Transnational Corporation Review*, 13(1), 109-124.

- Mehar, M. Ayub (2022). Magnitude of investment and global value chain: a case study of textile & clothing industry of Pakistan. *Journal of Textile Institute*, 113(2), 191-198.
- Miller, M. (1977). Debt and taxes. *Journal of Finance*, 72(2), 261–275.
- Miller, M. (1982). Dividends and taxes: some empirical evidence. *Journal of Political Economy*, 90(6), 1118–1141.
- Miller, M., & McConnell, J. J. (1995). Open market share repurchases programs and bid-ask spreads on the NYSE: implications for corporate payout policy. *Journal of Financial and Quantitative Analysis*, 30(3), 365–381.
- Miller, M., & Modigliani, F. (1958). The cost of capital, corporation finance and the theory of investment. *American Economic Review*, 48(3), 261–297.
- Miller, M., & Modigliani, F. (1961). Dividend policy, growth, and the valuation of shares. *Journal of Business*, 56(3), 411–433.
- Myers, S. (1989). The capital structure puzzle. *Journal of Finance*, 39, 575–592.
- Myers, S., & Majluf, N. (1984). Corporate financing and investment decisions when the firm has information that investors do not have. *Journal of Financial Economics*, 13(2), 187–221.
- Organization of Islamic Countries/ Islamic Chamber of Commerce, Industry and Agriculture. (2008). Key Success Factors for National SME Development Program. Proceedings of 6th Meeting on the OIC Task Force on SME. Bangkok, August 15-17.
- Shleifer, A., & Vishny, R. (1986). Large shareholders and corporate control. *Journal of Political Economy*, 94(3), 461–488.
- State Bank of Pakistan (2023). Balance Sheet Analysis of Companies (Non-financial Sector). Karachi: State Bank of Pakistan
- Wong, C.-Y., & Eng, Y.-K. (2019). Implications of Platform Finance on Monetary Policy Transmission. Asian Development Bank Institute: Working Paper Series, Working Paper No. 970.
- World Bank. (2017). World Development Indicators. Washington: World Bank Group.
- World Bank. (2018). World Development Indicators. World Bank Group.
- World Bank. (2019). World Development Indicators. World Bank Group.
- World Bank. (20229). World Development Indicators. World Bank Group.
- World Bank. (2023). World Development Indicators. World Bank Group.

DOES OWNERSHIP STRUCTURE MATTER FOR ECONOMIC PROFIT? CASE OF TURKIYE

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ABSTRACT

Purpose- This study aims to analyze the effects of three different (institutional, insider and foreign) ownership structures on firm performance proxied by economic profit. Besides, any possible effects of leverage and firm size on firm performance are also tested.

Methodology- This study conducts a multiple regression analysis to the yearly data of firms traded in the Borsa Istanbul 30 (BIST-30) Index for the period of 2010-2022.

Findings- Empirical findings refer the existence of statistically significant and positive relationships among institutional ownership and insider (managerial) ownership on firm performance. However, not any evidence of statistically significant relationship between foreign ownership and firm performance has been found.

Other findings concerning the control variables included in the research model are that while leverage has negative effect on firm performance, firm size affects firm performance positively.

Conclusion- This study contributes to the literature on the relationship between ownership structure and firm performance by using data including BIST-30 listed firms in Türkiye as an emerging market. Besides, the research model includes “economic profit” variable that is so rarely referred in existing literature on firm performance evaluation.

Keywords: Institutional ownership, insider ownership, foreign ownership, firm performance, economic profit.

JEL Codes: G32, G38, L19.

1. INTRODUCTION

Since the early 1990s, researchers and corporate managers have begun to focus on the concept of modern corporation. The modern corporation concept has been described by Demsetz (1967) by a series of property right terms. First, Demsetz (1967) realizes the efficiency of the modern corporation by delegating effective ownership to the management. He also describes shareholders as essentially lenders of equity capital and according to him, the limited liability protection for shareholders relieves them of the need for examining both the assets of other shareholders and the corporations' liabilities (debtholders). The existence of multiple shareholders in modern corporations has led the emergence of the concept of ownership structure. In publicly-traded firms, the ownership structure can be defined as the distribution of equity regarding votes and capital, and the identity of the equity owners. The theory of Berle and Means (1932) on the foundations of corporate law in the United States on the rise of modern corporations emphasizes the separation of legal ownership and control. This separation can simply be defined as that those who are the owners of the corporation are different from those who control it. Berle and Means (1932) warn that the very separation of ownership may destroy shareholder value, as managers may act on their own behalf to extract rents. Besides, the emergence of other ownership-related concepts such as diluted ownership; increasing limitations on ownership rights and the rise of managerial hegemony in listed firms have also been other causes of increasing concern on the relationship between ownership structure and firm performance.

The effect of ownership structure on various firm policies, focusing particularly on firm performance, has been widely researched in previous studies. However, empirical results somehow differ. Earlier studies of Jensen and Meckling (1976), Lichtenberg and Pushner (1994), and Mehran (1995) claim the existence of a monotonic relationship between ownership structure and firm performance. On the contrary, Morck et al. (1988), McConnell and Servaes (1990) and, Short and Keasey

(1999) state that the relationship between two is non-monotonic. The common point of all these studies is the assumption that ownership structure is an exogenous variable that it is determined outside the model. However, Demsetz (1983) and Demsetz and Lehn (1985) consider ownership structure as an endogenous variable and suggest that it does not have a direct effect on firm performance. Some other studies [see, for instance, Farooque et al. (2007) and Boone et al. (2011)] provide further evidence that there exists a bidirectional relationship between ownership structure and firm performance. Another characteristic of the related literature is that -ignoring the emerging economies- most studies on ownership structure are carried out in advanced economies and concentrate on the conflict between dispersed owners and unmonitored managers. However, firms in emerging economies are mostly characterized by relatively concentrated ownership and the conflict is mostly between minority and majority shareholders (Din et al., 2022). Additionally, a notably higher share of relatively large firms in emerging markets are family businesses (56% in India, 54% in Southeast Asia, and 46% in Brazil as compared to 33% in Unites States and 40% in Europe) (Bhalla, 2016).

This study primarily aims to fill this gap by examining the effect of ownership structure on firm performance for an emerging market (Türkiye) data. Compared to developed markets, emerging markets such as Türkiye have different political, economic, socio-cultural, and environmental structures. Besides, firms in these markets are mostly highly concentrated, family-owned firms and operate as affiliates of a group of companies owned by the same family or a group of families (Önder, 2003). The family members constitute the upper echelon of the management due to family ties and play a very central role in the decision-making processes of the firms. This situation creates a different kind agency problem unique to emerging markets' firms (Cheung et al., 2006; Panda and Bag, 2019). Another distinctive feature of this study is that it considers different dimensions of ownership structure as institutional, insider (or managerial) and foreign ownership structures.

The rest of the study is as follows. Sections 2 discusses the theoretical background and the empirical evidence, respectively. Section 3 is about the sample, data, variables, the research model and empirical findings. Finally, section 4 presents the findings and concludes the discussion.

2. THEORETICAL BACKGROUND AND EMPIRICAL EVIDENCE

Alchian and Demsetz (1972) and, Jensen and Meckling (1976) define firm as a series of contracts between production factors. However, these production factors mostly prioritize their own interests and are not aware that their success depends on the performance of the entire team and the competitive environment in which they operate (Fama, 1980). So, it can be concluded that a firm's (financial) performance is an output of its operations; and the primary objective of the firm's stakeholders is to maximize the firm's performance and so eventually their return that is positively correlated with the risk they undertake. The stakeholders' and especially the shareholders' risk and return phenomenon is tightly linked with their involvement in the firm and their potential in risk diversification (Laporsek et al., 2021).

The shareholders can reduce their risks through diversification by transferring their assets among firms with relatively low transaction costs. Unfortunately, excessive diversification of assets may sometimes cause excessive separation between ownership and control of firms. According to Demsetz (1983), though dispersed ownership reduces the shareholders' risks, it pressures their interest and attention in controlling the firm. Besides, monitoring firms with dispersed ownership may be a major cost-driver that lowers the required rate of return. On the contrary, concentrated ownership has also some benefits and costs. Concentrated ownership may reduce agency costs by increased monitoring of top management. However, it may also provide dominating owners with private benefits of control (Rose, 2019). Whether it is dispersed or concentrated, it is obvious that ownership structure is one basic determinant of the firm's (financial) performance. The possible effects of different ownership structures on performance have been subject to the agency and the resource dependence theories.

The agency theory of Jensen and Meckling (1976) is based on the proposition that there exists a separation between the management of firms (agent) and its owners (principal). This separation can potentially lead to agency conflicts (costs) between the managers and the shareholders of the firm such as excessive consumption of firm's resources on the behalf of the managers or false investment decisions. Moreover, it can also result in the dilution of shareholders' monitoring and this triggers managerial opportunism that has adverse effects on firm's performance (Berle and Means, 1932). These agency-related risks can be minimized by various mechanisms. Fama and Jensen (1983), and Fauzi and Locke (2012) offer setting up an effective board of directors; while Easterbrook (1984) suggests debt-financing and alternate dividend policies to minimize agency costs. Another mechanism is shaping a concentrated ownership by which the shareholders (in such situations, the blockholders) can discipline firm managers by utilizing their voting rights (Carney and Gedajlovic, 2001).

Another theory on the ownership structure and firm performance relationship is the resource dependence theory. This theory basically deals with how the external resources of a firm affect the behavior pattern of the firm. Though it is well-known that the external resources are vital for strategic, tactical and financial management of the firm, a theory on the consequences of this vitality has not been formalized till the study of Pfeffer and Salancik (1978) named "The External Control of Organizations: A Resource Dependence Perspective". Resource dependence theory deals with not only the optimal divisional structure of organizations, but also assignment of board members, selection of strategies, establishment of contract structures, and many other aspects of firm's organizational strategy. This theory assumes that resources provided by the others and the existence

of other firms are very necessary for a firm to achieve sustainable growth (Ulrich and Barney, 1984), as firms cannot be fully self-sufficient for survival (Boshnak, 2022). Later, Pfeffer and Salancik (1978) link their theory to corporate governance arguing that firms with constrained resources should strongly engage with their external environment through corporate governance. According to resource dependence theory, firm performance can be increased by reducing the level of dependence.

The empirical evidences on the ownership structure and firm performance relationship are rich but of diverse nature. Carlin and Mayer (2002) associate this diversity with differing institutional and cultural orientations across countries. Besides most studies on the subject investigate developed and developing countries [see, for instance, Morck et al. (1988); Dwivedi and Jain (2005); Elyasiani and Jia (2008); and Madiwe (2014)]. As this study reviews three different dimensions of ownership structure as institutional, insider (or managerial) and foreign ownership structures, the empirical findings of earlier studies is to be presented accordingly.

Theoretically, it is argued that institutional investors act as active monitors and struggle to maximize their investments. This phenomenon is reasonable as they also serve as catalyst for moderating the agency problems by lowering the adverse effects of unprofessional behavior of firm managers (Kang et al., 2007). This theoretical argument has empirically been supported by Smith (1996), Cornett et al. (2007), Elyasiani and Jia (2008), Alfaraih et al. (2012), Arouri et al. (2014), Abdallah and Ismail (2017), Lin and Fu (2017), Din et al. (2022) and Siddique et al. (2022), all providing a significant and positive relationship between institutional ownership and firm performance. However, some other studies observe a significant and weak or negative relationship [Dwivedi and Jain (2005); Elyasiani and Jia (2010); Ongore (2011); Arora and Sharma (2016); Al-Matari et al. (2017)]; or insignificant relationship [Agrawal and Knoeber (1996); Karpoff et al. (1996); Duggal and Millar (1999)] between institutional ownership and firm performance. Hussain et al. (2020) clarify this empirical finding on the reality that some institutional investors may have passive behavior patterns, so that they only try to compromise to protect their relationship with the firm. The hypothesis developed to address the relationship between institutional ownership and firm performance is as:

H1. There is a positive relationship between institutional ownership and firm performance.

Firm's top managers (or directors) as also shareholders may improve firm performance. The agency theory of Jensen and Meckling (1976) considers these managers as insider owners and as a mechanism that can reduce agency costs as they share a common interest along with the shareholders outside in the firm's success. Supporting this consideration, Kumar and Singh (2013) argue that in case of that the top managers own only a small portion of shares, the agency costs tend to increase, as these managers will prioritize and focus their own interests ignoring the shareholder value maximization goal of the firm. On the contrary, due to increase in shares held by the top managers, agency problems will relatively reduce and firm performance will increase. Palia and Lichtenberg (1999) also confirms this argument that insider ownership dilutes the adverse effects of myopic managerial behavior, enhancing firm performance. Likewise, Francis and Smith (1995), and Holthausen et al. (1995) state that insider ownership increases innovation and productivity, hence enhancing firm value. However, according to an opposite argument by Morck et al. (1988) and Denis and Denis (1994), insider ownership may tend to affect firm performance negatively, as it may weaken the efficiency of board and cause to lose internal control, especially in countries having poor corporate governance mechanisms and weak legal systems. Besides, Fama and Jensen (1983) see increasing insider ownership as a value-destroyer for minority shareholders.

Similar to the empirical literature concerning institutional ownership and firm performance, the literature on insider ownership and firm performance consists of varied empirical findings. Gugler et al. (2001), Iturralde et al. (2011), Talab et al. (2018), Al-Janadi (2021), Ivone and Shellen (2022), Iwasaki et al. (2022) provide certain and positive relationship between insider ownership and firm performance; while Al-Matari and Al-Arussi (2016), Alkurdi et al. (2021) posit opposite empirical findings. Finally, Shukeri et al. (2012) provide empirical evidence that relationship between insider ownership and firm performance is insignificant. Based on the literature given, the formulated hypothesis is as:

H2. There is a positive relationship between insider ownership and corporate financial performance.

Foreign ownership refers to the ownership of a portion of a firm's assets by individuals who are not citizens of that country or by a firm (or firms) whose headquarter(s) is (are) not in that country. Compared to the literature on institutional/insider ownership structures on firm performance, the literature concerning foreign ownership and firm structure relationship is quite limited with mixed results, and the related studies are outnumbered. Besides, the literature focuses mainly on developed economies and majority of the empirical findings posits a positive relationship between foreign ownership and corporate performance [Wei and Varela (2003); Douma et al. (2006); Hussain et al. (2020); Din et al. (2022); Ahmed et al. (2022)]. Pfeffer and Salancik (1978) and, Benfratello and Alessandro (2002) associate these findings with resource dependence theory. According to them, foreign ownership serves as a source of capital and allows access to technological resources which eventually increases firm performance. Contrary to this, Barbosa and Louri (2005) mount an argument that the unfamiliarity of foreign owners with a different investment environment may decrease firm performance. Elghuweel et al. (2017), and Amin and Hamdan (2018) provide evidence on the existence of negative relationship between foreign ownership and firm performance. Based on these arguments, the following hypothesis is as:

H3. There is a positive relationship between foreign ownership and firm performance.

3. METHODOLOGY

3.1. Sample and Data

This study aims to investigate the possible effects of ownership structures on firm performance and conducts a multiple regression analysis to the yearly data of firms traded in the Borsa Istanbul 30 (BIST-30) Index for the period of 2010-2022. The financial data concerning the sample is derived using a software by Finnet's *Financial Analyst* software.

3.2. Variables

3.2.1. Dependent Variable

The dependent variable included in the research model is economic profit as a proxy for firm performance. Main references to economic profit can be attributed to the free cash flow and capital structure theories of Modigliani and Miller (1958; 1961). After the theoretical foundations of economic profit has been laid by Kaplan and Zingales (1997), and Cleary (2002); some attempts have been made to measure the wealth of shareholders practically from 1970s to present, including Rappaport (1979), Stewart (1991), Stern et al. (1995), Grant (1996), and Uyemura et al. (1996). The common point of these attempts has been mostly relating free cash flow approach to the concept of value added.

Economic profit, in brief, can be said to be a variant of economic value added which is built on the concept of "excess return". Economic value added, economic profit or any other variant share the same basic idea that the value is created by generating excess returns on investments (Damodaran, 2005). The only difference among these variants is about to how these returns are calculated. The excess return calculation in economic profit is made from shareholders' perspective. So, the focus is on net income and cost of equity, rather than operating income and cost of capital.

3.2.2. Independent and Control Variables

The independent variables included in the research model are institutional ownership, insider ownership and foreign ownership. Besides, leverage and firm size are included in the model as control variables, proxied by total debt to total assets ratio and natural logarithm of firm's total assets, respectively. Definitions and descriptions of the variables in the research model are given in Table 1.

Table 1: Variables in the Research Model

Dependent Variable	Symbol	Calculation
Economic Profit	EP	Natural Logarithm of [Net Income – Cost of Equity* x Book Value of Equity]
Independent Variables		
Institutional Ownership	INSTOWN	Percentage of Shares Held by Institutional Owners to Total Number of Outstanding Shares
Insider Ownership	INSIOWN	Percentage of Shares Held by Board Members to Total Number of Outstanding Shares
Foreign Ownership	FOREOWN	Percentage of Shares Held by the Foreign Owners to Total Number of Outstanding Shares
Control Variables		
Leverage	LEV	Total Debt to Total Assets
Size	SIZE	Natural Logarithm of Total Assets

* Cost of equity is calculated by Capital Asset Pricing Model developed by Sharpe (1964) and Lintner (1965a, 1965b).

3.3. The Research Model

The relationships among EP, INSTOWN, INSIOWN, FOREOWN, LEV and SIZE are tested by the multiple regression equation as given below:

$$EP_t = \alpha_0 + \beta_1 INSTOWN_{it} + \beta_2 INSIOWN_{it} + \beta_3 FOREOWN_{it} + \beta_4 LEV_{it} + \beta_5 SIZE_{it} + \varepsilon_{it}$$

where; i , t and ε are firm identifier, year identifier and the error term, respectively.

3.4. Empirical Findings

3.4.1. Descriptive Statistics

The descriptive statistics for the research model variables are given in Table 2. The mean of the dependent variable (economic profit in natural logarithm) is 15.90 and ranges from around 14.00 to 19.45. The mean values for the independent variables, i.e. institutional, insider and foreign ownerships are 32.30%, 18.90% and 9.70%, respectively. The descriptive statistics of the sample show that institutional investors own 32.30% of outstanding shares, while 18.90% and 9.70% of outstanding shares are held by insider and foreign investors, respectively. The remaining 39.10% of outstanding shares are held by other types of investors.

In terms of control variables, leverage and firm size expressed in percentage and natural log forms have the mean values of 49.80% and 15.43. They range from 0.30% to 89.40% and from 14.00 to 20.57 with standard deviations of 25.70% and 1.324, respectively.

Table 2: Descriptive Statistics

Variables	Number of Observations	Mean	Minimum	Maximum	Standard Deviation
Dependent Variable					
EP	374	14.895	13.998	19.452	1.745
Independent Variables					
INSTOWN	374	0.323	0.000	0.921	0.282
INSIOWN	374	0.189	0.000	0.884	0.259
FOREOWN	374	0.097	0.000	0.958	0.261
Control Variables					
LEV	374	0.498	0.003	0.894	0.257
SIZE	374	15.426	14.001	20.568	1.324

3.4.2. Regression Analysis

The ownership structure is one of the most important determinants of firm performance due to the existence and a very nature of agency conflicts among the shareholders and firm managers. The research model of the study aims to analyze the possible effects of three different ownership structures including institutional, insider and foreign ownership structures on firm performance proxied by economic profit.

The results of multiple regression analysis from Table 3 indicate a statistically significant and positive relationship between institutional ownership and firm performance at 1% significance level. The related coefficient also implies that 1% increase in institutional ownership will increase economic profit by 5.05%. The empirical results also point the same (and even higher) effect of insider (managerial) ownership on firm performance with a coefficient of 10.28%. However, not any evidence of statistically significant relationship between foreign ownership and firm performance has been found.

The empirical findings concerning control variables, leverage and firm size indicate that while leverage has statistically negative effect on firm performance; firm size affects firm performance positively. The coefficient of leverage is -0.29 for economic profit indicating that a 1% increase in leverage will decrease firm performance by 0.29%. however, the coefficient concerning firm size is 0.07 and this means that 1% increase in firm size will increase firm performance by 0.07%.

Table 3: Regression Analysis

Dependent Variable: Economic Profit		
Variables	Coefficient	t-Value
INSTOWN	5.052***	5.21
INSIOWN	10.281***	3.60
FOREOWN	0.151	1.01
LEV	-0.287***	-10.36
SIZE	0.071*	8.43
R^2	0.384	
Adjusted R^2	0.352	
F Statistics	0.000	
Durbin-Watson	2.084	
N	374	

* and *** denote significance levels at 1% and 10%, respectively.

4. CONCLUSION

This study analyses the relationships among different ownership structures and firm performance. To the best of our knowledge, this is one of the pioneering studies that conducts an analysis to the data of Türkiye as a promising emerging market. The empirical findings are expected to fill the gap in existing literature on emerging markets and guide investors and firm managers.

The empirical findings indicate a statistically significant and positive relationship between institutional ownership and firm performance. This provides evidence that institutional investors have an effective role in mitigating adverse and value-destroying effects caused by the information asymmetries and agency problems observed in almost all firms. Besides, this finding is also an indicator of that institutional shareholders in Türkiye consider metrics concerning firm performance such as earning per share (EPS), market share, market price and economic profit etc., and actively monitor and try to control firm managers. This finding is in line with Pound (1988) and Cornett et al. (2007).

Another finding is the existence of a statistically significant and positive relationship between insider or managerial ownership and firm performance. This can be clarified that the combination of institutional and insider (managerial) ownership structures forces firm managers to pursue the primary financial goals of the firm rather than their personal goals. This finding also supports an agency theory prediction of that the concentration level of insider ownership is an instrument to improve firm performance. This finding is also supported by Zahra et al. (2018), Cheung and Wei (2006), and Shyu (2013).

Regarding the control variables, firm size is found to have a positive and significant effect on firm performance. This implies that with the expansion of firm size, firm performance increases. Besides, leverage has a significant and negative effect on firm performance. This implies that increase in leverage reduces firm performance due to increase in financial risk cost of capital.

REFERENCES

- Abdallah, A. A.-N. & Ismail, A. K. (2017). Corporate governance practices, ownership structure, and corporate performance in the GCC countries. *Journal of International Financial Markets, Institutions and Money*, 46(C), 98-115.
- Agrawal, A. & Knoeber, C. R. (1996). Firm performance and mechanisms to control agency problems between managers and shareholders. *Journal of Financial and Quantitative Analysis*, 31(3), 377-397.
- Ahmed, Z., Hussin, M. R. A. & Pirzada, K. (2022). The impact of intellectual capital and ownership structure on firm performance. *Journal of Risk and Financial Management*, 15(12), 1-15.
- Alchian, A. A. & Demsetz, H. (1972). Production, information costs, and economic organization. *The American Economic Review*, 62(5), 777-795.
- Alfaraih, M., Alanezi, F. & Almujaed, H. (2012). The influence of institutional and government ownership on firm performance: evidence from Kuwait. *International Business Research*, 5(10), 192-200.
- Al-Janadi, Y., Abdul Rahman, R. & Alazzani, A. (2016). Does government ownership affect corporate governance and corporate disclosure? Evidence from Saudi Arabia. *Managerial Auditing Journal*, 31(8/9), 871-890.

- Alkurdi, A., Hamad, A., Thneibat, H. & Elmarzouky, M. (2021). Ownership structure's effect on financial performance: an empirical analysis of Jordanian listed firms. *Cogent Business and Management*, 8(1), 1-21.
- Al-Matari, E. M. & Al-Arussi, A. S. (2016). The effect of the ownership structure characteristics on firm performance in Oman: empirical study. *Corporate Ownership and Control Journal*, 13(2), 93-182.
- Al-Matari, E. M., Al-Matari, Y. & Mohammed, S. A. (2017). Association between ownership structure characteristics and firm performance: Oman evidence. *Academy of Accounting and Financial Studies Journal*, 21(1), 11-21.
- Amin, A. A. & Hamdan, A. M. (2018). Evaluating the effect of ownership structure on firm performance: evidence from Saudi Arabian listed companies", *Journal of Economic Cooperation and Development*, 39(3), 65-92.
- Arora, A. & Sharma, C. (2016). Corporate governance and firm performance in developing countries: evidence from India. *Corporate Governance*, 16(1), 420-436.
- Arouri, H., Hossain, M. & Muttakin, M. B. (2014). Effects of board and ownership structure on corporate performance: evidence from GCC countries. *Journal of Accounting in Emerging Economies*, 4(1), 117-130.
- Barbosa, N. & Louri, H. (2005). Corporate performance: does ownership matter? A comparison of foreign-and domestic-owned firms in Greece and Portugal. *Review of Industrial Organization*, 27(1), 73-102.
- Benfratello, L. & Alessandro, S. (2002). Foreign ownership and productivity: is the direction of causality so obvious?. *Centro Studi Luca D'Agliano Development Studies Working Paper*, Vol. 166.
- Berle, A. A. & Means, G. C. (1932). *The modern corporation and private property*. New York: Macmillan.
- Bhalla, V., Orglmeister, C. & Tong, D. (2016). *What makes family businesses in emerging markets so different?. BCG Perspectives*, The Boston Consulting Group, Inc.
- Boone, N., Colombage, S. & Gunasekarage, A. (2011). Block shareholder identity and firm performance in New Zealand. *Pacific Accounting Review*, 23(2), 185-210.
- Boshnak, H. A. (2022). Ownership structure and firm performance: evidence from Saudi Arabia. *Journal of Financial Reporting and Accounting*, 1985-2517.
- Carlin, W. & Mayer, C. (2002). International evidence on corporate governance: lessons for developing countries. *Journal of African Economies*, 11(1), 37-59.
- Carney, M. & Gedajlovic, E. (2001). Corporate governance and firm capabilities: a comparison of managerial, alliance, and personal capitalisms. *Asia Pacific Journal of Management*, 18(3), 335-354.
- Cheung, W. A. & Wei, K. J. (2006). Insider ownership and corporate performance: evidence the adjustment cost approach. *Journal of Corporate Finance*, 12(5), 906-925.
- Cheung, Y-L., Rau, P. R. & Stouraitis, A. (2006). Tunneling, propping, and expropriation: Evidence from connected party transactions in Hong Kong. *Journal of Financial Economics*, 82(2), 343-386.
- Cleary, S. (2002). The relationship between firm investment and financial status. *Journal of Finance*, 54(2), 673-692.
- Cornett, M. M., Marcus, A. J., Saunders, A. & Tehranian, H. (2007). The impact of institutional ownership on corporate operating performance. *Journal of Banking and Finance*, 31(6), 1771-1794.
- Damodaran, A. (2005). *Valuation approaches and metrics: a survey of the theory and evidence*. *Foundations and Trends in Finance*, 1(8).
- Demsetz, H. & Lehn, K. (1985). The structure of corporate ownership: causes and consequences. *Journal of Political Economy*, 93(6), 1155-1177.
- Demsetz, H. (1967). *Toward a theory of property rights*. *The American Economic Review (Papers and Proceedings of the Seventy-ninth Annual Meeting of the American Economic Association)*, 57(2), 347-359.
- Demsetz, H. (1983). The structure of ownership and the theory of the firm. *The Journal of Law and Economics*, 26(2), 375-390.
- Denis, D. J. & Denis, D. K. (1994). Majority owner-managers and organizational efficiency. *Journal of Corporate Finance*, 1(1), 91-118.
- Din, S. U., Khan, M. A., Khan, M. J. & Khan, M. Y. (2022). Ownership structure and corporate financial performance in an emerging market: a dynamic panel data analysis. *International Journal of Emerging Markets*, 17(8), 1973-1997.

- Douma, S., George, R., & Kabir, R. (2006). Foreign and domestic ownership, business groups, and firm performance: evidence from a large emerging market. *Strategic Management Journal*, 27(7), 637-657.
- Duggal, R. & Millar, J. A. (1999). Institutional ownership and firm performance: the case of bidder returns. *Journal of Corporate Finance*, 5(2), 103-117.
- Dwivedi, N. & Jain, A. K. (2005). Corporate governance and performance of Indian firms: the effect of board size and ownership. *Employee Responsibilities and Rights Journal*, 17(3), 161-172.
- Easterbrook, F. H. (1984). Two agency-cost explanations of dividends. *The American Economic Review*, 74(4), 650-659.
- Elghuweel, M. I., Ntim, C. G., Opong, K. K. & Avison, L. (2017). Corporate governance, Islamic governance and earnings management in Oman: new empirical insights from a behavioral theoretical framework. *Journal of Accounting in Emerging Economies*, 7(2), 190-224.
- Elyasiani, E. & Jia, J. (2008). Institutional ownership stability and BHC performance. *Journal of Banking and Finance*, 32(9), 1767-1781.
- Elyasiani, E. & Jia, J. (2010). Distribution of institutional ownership and corporate firm performance. *Journal of Banking and Finance*, 34(3), 606-620.
- Fama, E. F. & Jensen, M. C. (1983). Separation of ownership and control. *The Journal of Law and Economics*, 26(2), 301-325.
- Fama, E. F. (1980). Agency problems and the theory of the firm. *Journal of Political Economy*, 88(2), 288-307.
- Farooque, O. A., van Zijl, T., Dunstan, K. & Karim, A. W. (2007). Ownership structure and corporate performance: Evidence from Bangladesh. *Asia-Pacific Journal of Accounting & Economics*, 14(2), 127-149.
- Fauzi, F. & Locke, S. (2012). Board structure, ownership structure and firm performance: a study of New Zealand listed-firms. *Asian Academy of Management Journal of Accounting and Finance*, 8(2), 43-67.
- Francis, J. & Smith, A. (1995). Agency costs and innovation some empirical evidence. *Journal of Accounting and Economics*, 19(2), 383-409.
- Grant, J. L. (1996). Foundations of EVA for investment managers. *Journal of Portfolio Management*, 23, 41-48.
- Gugler, K., Mueller, D. C. & Yurtoglu, B. B. (2001). Corporate governance, capital market discipline and the returns on investment, <https://nbnresolving.org/urn:nbn:de:0168-ssoar-115447>.
- Holthausen, R. W., Larcker, D. F. & Sloan, R. G. (1995). Annual bonus schemes and the manipulation of earnings. *Journal of Accounting and Economics*, 19(1), 29-74.
- Hussain, M., Abid, F., Ambreen, S., Usman, A. & Rahman, A. U. (2020). The role of institutional ownership structures on corporate performance. *Journal of Public Affairs*, 22(1), 1-8.
- Iturralde, D. T., Maseda, A. & Arosa, B. (2011). Insiders ownership and firm performance: empirical evidence. *International Research Journal of Finance and Economics*, 67, 118-129.
- Ivone, I. & Shellen, S. (2022). Ownership structure and board structure on firm performance: moderating effect of political connections. In *CoMBInES-Conference on Management, Business, Innovation, Education and Social Sciences*, 2(1), 245-250.
- Iwasaki, I., Ma, X. & Mizobata, S. (2022). Ownership structure and firm performance in emerging markets: a comparative meta-analysis of east European EU member states, Russia and China. *Economic Systems*, 46(2), 100945.
- Jensen, M. C. & Meckling, W. H. (1976). Theory of the firm: managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, 3(4), 305-360.
- Kang, H., Cheng, M. & Gray, S. J. (2007). Corporate governance and board composition: diversity and independence of Australian boards. *Corporate Governance: An International Review*, 15(2), 194-207.
- Kaplan, S. N. & Zingales, L. (1997). Do investment-cash flow sensitivities provide useful measures of financing constraints?. *The Quarterly Journal of Economics*, 112(1), 169-213.
- Karpoff, J. M., Malatesta, P. H. & Walkling, R. A. (1996). Corporate governance and shareholder initiatives: empirical evidence. *Journal of Financial Economics*, 42(3), 365-395.
- Kumar, N. & Singh, J. P. (2013). Effect of board size and promoter ownership on firm value: some empirical findings from India. *Corporate Governance: The International Journal of Business in Society*, Vol. 13(1), 88-98.

- Laporsek, S., Dolenc, P., Grum, A. & Stubelj, I. (2021). Ownership structure and firm performance – the case of Slovenia. *Economic Research*, 34(1), 2975-2996.
- Lichtenberg, F. R. & Pushner, G. M. (1994). Ownership structure and corporate performance in Japan. *Japan and the World Economy*, 6(3), 239-261.
- Lin, Y. R. & Fu, X. M. (2017). Does institutional ownership influence firm performance? Evidence from China. *International Review of Economics and Finance*, 49(1), 17-57.
- Lintner, J. (1965a). The Valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. *Review of Economics and Statistics*, 47(1), 13–37.
- Lintner, J. (1965b). Security prices, risk and maximal gains from diversification. *Journal of Finance*, 20(4), 587–615.
- Madiwe, J. (2014). Ownership structure, inside ownership and firm performance. University of Twente, Enschede.
- McConnell, J. J. & Servaes, H. (1990). Additional evidence on equity ownership and corporate value. *Journal of Financial Economics*, 27(2), 595-612.
- Mehran, H. (1995). Executive compensation structure, ownership, and firm performance. *Journal of Financial Economics*, 38(2), 163-184.
- Modigliani, F. & Merton H. M. (1958). The cost of capital, corporation finance, and the theory of investment. *American Economic Review*, 48(3), 261-297.
- Morck, R., Shleifer, A. & Vishny, R. W. (1988). Management ownership and market valuation: An empirical analysis. *Journal of Financial Economics*, 20(1), 293-315.
- Önder, Z. (2003). Ownership concentration and firm performance: Evidence from Turkish firms. *METU Studies in Development*, 30 (December), 181-203.
- Ongore, V. O. (2011). Corporate governance and performance: an analysis of ownership structure in Kenya. *International Journal of Governance*, 1(2), 404-423.
- Palia, D. & Lichtenberg, F. (1999). Managerial ownership and firm performance: a re-examination using productivity measurement. *Journal of Corporate Finance*, 5(4), 323-339.
- Panda, B. & Bag, D. (2019). Does ownership structure affect firm Performance in an emerging market? The case of India. *Asian Journal of Business and Accounting* 12(1), 189-227.
- Pfeffer, J. & Salancik, G. R. (1978), *The external control of organizations: a resource dependence perspective*. New York: Harper & Row.
- Pound, J. (1988). Proxy contests and the efficiency of shareholder oversight. *Journal of Financial Economics*, 20(1-2), 237-265.
- Rappaport, A. (1979). Strategic analysis for more profitable acquisitions. *Harvard Business Review*, July.
- Rose, C. (2019). Concentrated ownership. *Encyclopedia of Law and Economics*, 299-304.
- Sharpe, W. F. (1964). Capital asset prices: a theory of market equilibrium under conditions of risk. *Journal of Finance*, 19(3), 425-442.
- Short, H. & Keasey, K. (1999). Managerial ownership and the performance of firms: Evidence from the UK. *Journal of Corporate Finance*, 5(1), 79-101.
- Shukeri, S. N., Shin, O. W. & Shaari, M. S. (2012). Does board of director's characteristics affect firm performance? Evidence from Malaysian public listed companies. *International Business Research*, 5 (9), 120-127.
- Shyu, J. (2013). Ownership structure, capital structure, and performance of group affiliation: evidence from Taiwanese group-affiliated firms. *Managerial Finance*, 39(4), 404-420.
- Siddique, M., Rasheed, A. & Rehman, K. U. (2022). Role of research and development innovation between ownership structure and firm performance. *Human Nature Journal of Social Sciences*, 3(3), 57-70.
- Smith, M. P. (1996). Shareholder activism by institutional investors: evidence from CalPERS. *The Journal of Finance*, 51(1), 227-252.
- Stern, J. M., Stewart, G. B. & Chew, D. H. (1995). The EVA financial management system. *Journal of Applied Corporate Finance*, 8(2), 32-46.

Stewart, G. B. (1991). *The quest for value*. New York: Harper Publications.

Talab, H. R., Abdul Manaf, K. B. & Abdul Malak, S. S. D. (2018). Ownership structure, external audit and firm performance in Iraq. *Social Science and Humanities Journal*, 2(2), 343-352.

Ulrich, D. & Barney, J. B. (1984). Perspectives in organizations: resource dependence, efficiency, and population. *The Academy of Management Review*, 9(3), 471-481.

Uyemura, D. G., Kantor, C. C. & Petit, J. M. (1996). EVA for banks: value creation, risk management, and profitability measurement. *Journal of Applied Corporate Finance*, 9(2), 94-111.

Wei, Z., & Varela, O. (2003). State equity ownership and firm market performance: evidence from China's newly privatized firms. *Global Finance Journal*, 14(1), 65-82.

Zahra, K., Khan, M. J. & Warraich, M. A. (2018). CEO characteristics and the probability of financial distress: evidence from Pakistan. *NUML International Journal of Business and Management*, 13(2), 117-129.