DETERMINING THE INFLUENCE OF OIL PRICES ON ECONOMIC GROWTH AND FINANCIAL DEVELOPMENT: AN ANALYSIS FOR TURKEY WITH VAR METHODOLOGY

Serhat YÜKSEL[*]
ORCID ID: 0000-0002-9858-1266
Gözde Gülseven UBAY[**]
ORCID ID: 0000-0002-6709-6495
Damla SEZER[***]
ORCID ID: 0000-0003-1844-7487

Abstract: In this study, it is aimed to determine the effects of oil prices changes in economic growth and financial development in Turkey. For this purpose, annual data of these variables are taken into account for the years between 1983 and 2018. In this context, three different models have been created by considering VAR methodology. The results of the analysis show that oil prices have no serious impact on financial development. In addition to the stated issue, it is also concluded that oil prices have a small influence on the economic growth. It can be recommended that in order for economic development to become sustainable, the volatility in oil prices must be lowered. Based on these considerations, it is understood that Turkey needed to decrease its dependence on foreign energy. In this context, it is necessary to increase the exploration activities for energy resources in the country. Sufficient technological equipment and competent personnel are needed to carry out these search activities more effectively. In addition to the mentioned issues, the use of renewable energy sources will also reduce the dependence of the outside and Turkey's energy. In this context, government incentives to use more renewable energy alternatives such as wind, solar,

[*] Assoc. Prof., Istanbul Medipol University, Faculty of Business and Management Sciences, International Trade and Finance Department, serhatyuksel@medipol.edu.tr

[**] Undergraduate, İstanbul Medipol University, Faculty of Busıness and Management Sciences, Department of Economics and Finance, gozde.ubay@std.medipol.edu.tr

[***] Undergraduate, İstanbul Medipol University, Faculty of Busıness and Management Sciences, Department of Economics and Finance, damla725@hotmail.com

geothermal, biomass and hydroelectric power are important. In this case, Turkey will use its energy resources to be contributed. Otherwise, the sudden increase in oil prices will lead to a decrease in the efficiency of the financial system in the country.

Keywords: Oil Price; Economic Growth; Financial Development; VAR Analysis.

PETROL FİYATLARINDAKİ DEĞİŞİKLİKLERİN EKONOMİK BÜYÜME VE FİNANSAL GELİŞİM ÜZERİNDEKİ ETKİLERİNİN BELİRLENMESİ: VAR YÖNTEMİ YARDIMIYLA TÜRKİYE İÇİN BİR ANALİZ

Öz: Bu çalışmada, Türkiye'de petrol fiyatlarındaki değişimlerin ekonomik büyüme ve finansal kalkınma üzerindeki etkilerinin belirlenmesi amaçlanmıştır. Bu amaca yönelik olarak, değişkenlerin 1983-2018 yılları arasındaki yıllık verileri dikkate alınmıştır. Bu bağlamda, VAR metodolojisi kullanılarak üç farklı model oluşturulmuştur. Analiz sonuçları petrol fiyatlarının finansal piyasalar üzerinde ciddi bir etkisi olmadığını göstermektedir. Belirtilen konuya ek olarak, petrol fiyatlarının ekonomik büyüme üzerinde düşük ölçüde etkili olduğu sonucuna varılmıştır. Ekonomik büyümenin sürekli olabilmesi için önce petrol fiyatlarındaki oynaklığın azaltılması tavsiye edilmektedir. Bu husustan yola çıkarak, Türkiye'nin enerji konusunda dışa bağımlılığını azaltmasının gerektiği anlaşılmaktadır. Bu bağlamda, ülke içerisindeki enerji kaynaklarına yönelik arama faaliyetlerinin arttırılması gerekmektedir. Söz konusu arama faaliyetlerinin daha etkin bir şekilde gerçekleştirilebilmesi için yeterli teknolojik donanıma ve yetkin personele ihtiyaç duyulmaktadır. Belirtilen hususa ek olarak, yenilenebilir enerji kaynaklarının kullanılması da Türkiye'nin enerji konusunda dışarıya olan bağımlılığını azaltacaktır. Bu çerçevede, rüzgar, güneş, jeotermal, biyokütle ve hidroelektrik gibi yenilenebilir enerji alternatiflerinin daha fazla kullanılabilmesine yönelik verilecek devlet teşvikleri önem arz etmektedir. Bu durum, Türkiye'nin kendi enerji kaynaklarını kullanabilmesine katkı sağlayacaktır. Aksi durumda, petrol fiyatlarındaki ani artış, ülkedeki finansal sistemin etkinliğinin azalmasına yol açacaktır.

Anahtar Kelimeler: Petrol Fiyatı; Ekonomik Büyüme; Finansal Gelişme; VAR Analizi.

INTRODUCTION

Economic growth and development are important for every country. In this context, the countries take many different actions in order to improve their economies. Especially after the globalization, economic borders between the countries disappeared. Therefore, trade between countries has increased significantly so that countries have had the opportunity to further develop their economies.[1] In other words, it can be said that globalization created an opportunity for the countries to have economic growth. Because it is so essential, all countries try to develop appropriate strategies to achieve economic growth. In this framework, in order to generate the correct strategies, countries, firstly, should understand the main factors that affect this situation.

Oil price is accepted as an important indicator for national economies. The main reason for this issue is that countries have to supply oil regardless of having their own resources or not. Therefore, an increase or decrease in oil prices is an influential factor for the country's economies.[2] This is especially important for countries that import oil. Because these countries do not have their own resources, they have to buy oil from abroad. In the imported oil, it is generally purchased in different currencies such as Dollars and Euros. Hence, the increase in the foreign currencies will go up the oil price, and this situation will disrupt the country's macroeconomic balances.[3]

Within this context, the important point is to understand main indicators of oil prices. It is possible to talk about many different issues that can affect the oil price. For example, political and economic problems between countries may affect oil prices positively or negatively. In oil crises in previous years, there has been a serious increase in oil prices. [4]On the other hand, the fact that the supply amount of oil is more or less is another factor affecting the price. When the supply of oil increases, the price of oil will decrease.[5] Due to this situation, all countries aim to have new oil resources in order to minimize their energy costs.

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[1] Lingchao Li - Jin Long Liu - H., de Jong, Wil & Yeo-Chang Youn, "Economic Globalization, Trade and Forest Transition-The Case of Nine Asian Countries", *Forest Policy and Economics* 76 (2017): 7-13.

[2] Heiko Hesse - Tigran Poghosyan (2016). Oil Prices and Bank Profitability: Evidence From Major Oil-Exporting Countries in the Middle East and North Africa. *Financial Deepening and Post-Crisis Development in Emerging Markets* (New York: Palgrave Macmillan2016), 247-270.

[3] Willem Thorbecke, "Oil Prices and the US Economy: Evidence from the Stock Market", *Journal of Macroeconomics* 61 (2019): 103-137.

[4] Saban Nazlioglu - Alper Gormus - Uğur Soytas, "Oil Prices and Monetary Policy in Emerging Markets: Structural Shifts in Causal Linkages", *Emerging Markets Finançe and Trade* 55/1 (2019), 105-117.

[5] Usama Al-Mulali - Hassan Gholipour - Ekhlas Al-hajj. "The Nonlinear Effects of Oil Prices on Tourism Arrivals in Malaysia"*, Current Issues in Tourism* (2019), 1-5.

In addition to these variables, changes in international markets affect oil prices. As an example, oil prices are expected to increase as the US dollar appreciates against other currencies.[6] The main reason for this issue is that oil is sold in dollars, which is the currency of the world. Therefore, the more valuable dollar will make oil more expensive. In addition, policies implemented by OPEC, known as the Union of Petroleum Exporting Countries, may cause changes in oil prices. Since the countries belonging to this union can hold a significant part of the world's oil reserves, their decisions can lead to an increase or decrease in oil prices.[7] Moreover, the cost of oil production can also have a significant influence on the oil prices for the countries.

On the other hand, it is also obvious that the price of oil seems to have an impact on many variables. For example, the increase in oil prices may negatively affect the current account balance of countries.[8] Especially for energy-dependent countries, the increase in oil prices means an increase in import figures. This situation causes companies to have a current account deficit problem. The high current account deficit is considered as one of the important indicators of financial crises. Therefore, investors are worried in countries with a high current account deficit problem.[9] As a result, investments in the country are adversely affected by this problem. In summary, volatility in oil prices can negatively affect both the economic and financial development of the country.

In this study, it is aimed to examine the relationship between oil prices with economic growth and financial development. For this purpose, Turkish market is taken into consideration. Since it is a developing and energy importer country, identifying the effects of oil prices plays a key role for this situation. Hence, it can also be said that the analysis results can give a guide to other developing countries. It is thought that this situation is an important motivation of the study. In order to achieve this goal, it is aimed to use the VAR model. Since the model aims to examine the relationship between the three variables, three different models will be obtained. Additionally, in the analysis process, annual data for the periods between 1983 and 2018 is taken into consideration. The main contribution of this study to the literature is that necessary recommendations can be provided for energy importer countries to minimize their market risks. In

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[6] Saleh Alodayni, "Oil Prices, Credit Risks in Banking Systems, and Macro-Financial Linkages across GCC Oil Exporters", *International Journal of Financial Studies* 4/4 (2016), 23.

[7] Alredany, Wajdi Hamza Dawod. "A Regression Analysis of Determinants Affecting Crude Oil Price", *International Journal of Energy Economics and Policy* 8/4 (2018), 110-119.

[8] Joseph P. Byrne - Marco Lorusso - Bing, Xu, "Oil Prices, Fundamentals and Expectations", *Energy Economics* 79 (2019), 59-75.

[9] Elena Maria Diaz - Juan Carlos Molero - Fernando Perez de Gracia, "Oil Price Volatility and Stock Returns in the G7 Economies", *Energy Economics* 54 (2016), 417-430.

addition to this situation, using VAR model has also increasing effect on the originality of this study with respect to the methodology.

There are four different sections in the study in question. General information about the subject is given in the introduction section. On the other hand, the studies in the literature will be analyzed in detail in the second part. In the third part, analysis results are presented. Moreover, in the conclusion and discussion part of the study, the findings will be given as a result of VAR evaluation. Furthermore, in this section, the information obtained as a result of the analysis will be shared and interpreted.

1. LITERATURE REVIEW

The determinants of oil price were evaluated in the literature by many different researchers. In these studies, various indicators are taken into account. In this context, currency exchange rate was found as a significant determinant of the oil price. For example, Drachal (2016) examined the development of oil prices between 1986 and 2015 by using ARIMA method. In this context, it has been tried to be determined what affects oil prices in Chinese economy. As a result, it was determined that the exchange rate have a significant effect on the oil price. Abraham and Harrington (2016) aimed to predict the determinants of futures prices in the study. Due to the high inelastic demand, commodity pricing is evaluated in a special position with oil. While the surplus of oil is the most important determinant of oil prices, traders' speculation through buying and selling further increases the fall in oil prices.

In addition, Wei et al. (2017) aimed to determine the most informative determinant in predicting crude market volatility in their studies. GARCH class model based on mixed data sampling regression and dynamic model mean combination method was used to examine predictive power of determinants. This study provides a new perspective on oil exchanges bond by examining the predictability of oil return and volatility in momentum on the Chinese Stock Exchange. The findings show that oil market dynamics can contribute to stock market inefficiencies and these inefficiencies will create significant abnormal profits for active managers. Baumester and Kilian (2015) provides an overview of the causes of all major oil price fluctuations between 1973 and 2014 for the first time in his study. In practice, it has been documented that consumers, policymakers, financial market participants and economists may have different oil price expectations.

On the other side, the relationship between oil price and economic growth was identified in various studies. For instance, in the reviews of Albaity and Mustafa (2018), the Gulf Cooperation Council (GCC) examined the linear long and short-term relationships of stock returns, exchange rates, gold prices and oil prices for six

countries. The study was carried out within the framework of a panel based on monthly data between 2005 and 2015. The causality test shows that there is a one-way relationship between oil prices and GDP, and a two-way relationship between stock returns and oil prices. For soundness, it is divided into two sub-periods, before and after the 2007/2008 global financial crisis. While there was no short-term relationship between oil prices and variables before the crisis, a long-term relationship was found between the variables. Oil shock is a major factor in gold returns and exchange rate growth. GDP growth rate affects oil prices. The results emphasized the need for policies aimed at further reducing oil dependence, as the impact of oil shocks is still important in these economies. Caldara et al. (2019) studies describing oil shocks using the structural vector auto regression (VAR) draw different conclusions about the relative importance of supply and demand factors when explaining market fluctuations. This conflict arises from the demand elasticities that define the definition of oil shocks and the different assumptions in oil supply. When estimated elasticities are included in a structural VAR, supply and demand shocks play an equally important role in explaining oil prices and oil quantities.

However, Alredany (2018), in their study, addressed the factors affecting the crude oil price. Factors contributing to the fluctuation in oil prices in general; supply days, comfort efficiency, inadequate investment and geopolitical neglect. A new model of the most important variables affecting crude oil prices is explained using a new technique called principal component analysis (PCA) that can capture basic and geopolitical variables. The results show that the roles and foundation of oil exporting countries are the most important variables affecting crude oil prices. In addition, Kruse and Wegener (2019) provide empirical evidence for a significant time change in the permanence of real oil prices in their study. They use a large data set with more than one hundred and fifty potential determinants, including oil-related variables (production and stocks) and basic macroeconomic series for G7 countries. Using model averaging techniques, it internally takes into account the uncertainty of the internal model when dealing with so many potential explanatory variables. The only and only important measure to explain the continuity in oil prices varying over time is the global real economic activity index. In line with the latest findings, they argue that instead of being the driving force of explosive oil prices in the 2000s, there were fundamentals rather than speculation.

Another important issue in the literature regarding this condition is that there is a relationship between financial development and oil prices. Hesse and Poghosyan (2016) analyzed the relationship between bank profitability and oil price shocks. Direct and indirect impact hypotheses of oil price shocks on bank profitability were tested using data from 145 banks in the Middle East and North Africa (MENA) countries exporting

11 oil between 1994-2008. The results show that oil price shocks have an indirect impact on bank profitability driven by country-specific macroeconomic and institutional variables, and its direct impact is insignificant. Investment banks appear to be the most affected among organizational forms compared to Islamic and Commercial Banks. The findings highlight the effects of oil price shocks on bank performance and highlight the importance for macro prudential regulations in MENA countries.

Moreover, Oladosu et al. (2018) also provides a quantitative meta-analysis of the oil price elasticity of GDP for net oil importing countries that focus on the US in their study. In studies, a meta-regression model is used that controls the main determining factors to estimate the variance and average of GDP elasticity. The resulting regression model has been used in the U.S. to simulate oil price elasticity of GDP. In addition, Gupta (2016) shows that oil price shocks have a significant impact on broadside and macroeconomics. Using a comprehensive firm-level monthly data from 70 countries ranging from 1983-2014, it was found that firm-level returns negatively affect macroeconomic returns.

On the other hand, Le (2015) investigate the causes and behavior of price fluctuations in the crude oil market from January 1997 to December 2012. In the study, determinants in GARCH type model were used. The study shows that the crude oil market is characterized by volatility, and a negative shock is more effective on future volatility. Crude oil volatility is lower at higher prices. OPEC announcements and meetings Oil Status Report publications cause volatility to increase. On the other hand, Byrne et al. (2019) empirically addresses the relationship between traditional foundations and expectations and oil prices in their study. Oil is a key energy source for the global economy and is essential for economic activity. Informative discussions, especially in times of high-risk avoidance and uncertainty, can form a context between supply and demand shocks and oil prices. In this context, expectations can be an important factor for oil price movements and their effects may change over time. In general, we see that traditional oil foundations and prospective expectations are important for oil prices. Findings show that real oil prices react differently to expectations shocks of business leaders, consumers and total markets.

Furthermore, Volkov and Yuhn (2016) examines the effects of oil price shocks in five major oil exporting countries on exchange rate movements. These countries; Brazil, Russia, Canada, Mexico and Norway. Volatility due to oil price shocks in exchange rates is important in Brazil, Russia and Mexico, but weaker in Canada and Norway. In Russia, Brazil and Mexico, the exchange rate takes much longer to reach the first equilibrium level than in Canada and Norway. The asymmetrical behavior of exchange

rate volatility between countries seems to be related to the efficiency of financial markets rather than the importance of oil revenues in the economy.

In addition, the price of oil can be determined by many factors such as economic policy, global economic outlook, legal uncertainty in countries with high oil consumption and political stability in oil exporting countries, such as oil supply and demand. Historically, the price of oil has been closely related to wars and political tension.[10] For example, in 1973, the Arab-Israeli war led to an OPEC oil embargo, leading to a significant increase in oil price.[11] Additionally, Bayat et al. (2015) investigated the causal dynamics between crude oil prices and exchange rates in the Czech Republic, Poland and Hungary, using monthly data. In the study, the latest advancement in time series econometrics analysis is used. Linear causality, nonlinear causality, volatility propagation and frequency domain causality tests are performed. The frequency domain causality test results show that despite the high import energy dependency of the economy, oil price fluctuations did not affect the exchange rate in any period in Hungary.

Additionally, Alodayni (2016) evaluated the impact of the fall in oil prices on financial stability in the Gulf Cooperation Council (JCC) region in 2014-2015. The first aim of the study is to evaluate how oil price shock spreads within macroeconomics and how macro shocks affect the balance sheets of GCC banks. For this, a panel fixed effect model is applied to estimate the response of the system Generalized Moments (GMM) and macroeconomic determinants of irregular loans. On the other hand, Diaz et al. (2016) examines the relationship between stock returns and volatility in oil prices in G7 economies (Canada, France, Germany, Italy, Japan, the UK and the USA). The relationship is examined by using monthly data between 1970-2014. Oil volatility is measured taking into account its alternative properties for oil prices. The results show that the global oil price volatility is more important for exchanges than the national oil price volatility.

As can be seen from the literature review, there are many studies in the literature regarding oil prices. In a significant part of these studies, the factors affecting oil prices were taken into consideration. On the other hand, some of the studies also examined the effects of oil prices on other variables. In addition, different country groups were handled in the studies and different methods were used. As a result, it is concluded that such variables may differ on a country basis. Therefore, in a new analysis, it is thought

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[10] Lieber, Robert J, "Oil and power after the Gulf War", *International Security*, 17(1) (1992): 155-176.

[11] Tignor, Robert, "*Worlds together, worlds apart: a history of the world from the beginnings of humankind to the present*", WW Norton, (2014)

that it will be more accurate to examine a single country rather than country groups. In this context, in this study, the effect of oil prices on economic growth and financial developments in Turkey were examined. Therefore, it is believed that this study will contribute to literature.

2. AN ANALYSIS ON OIL PRICES IN TURKEY

In this study, it is aimed to determine the effects of oil prices on economic and financial development in Turkey. In this section, firstly, data set and variables are explained. After that, theoretical information related to VAR method will be given. In the final part, analysis results will be shared.

2. 1. Data Set and Variables

In the analysis process of this study, crude oil prices in the form of US dollar/barrel are taken into account. On the other hand, with respect to the economic growth, the increase amount in GDP is used. In addition to them, regarding financial development, the loan amount as the percentage of GDP is considered. Annual data of these variables between 1983 and 2018 is evaluated and this data is taken from OECD.

2. 2. Theoretical Information about VAR Method

The VAR method is used to determine the mutual relationship between two or more variables. The VAR method takes into account the bidirectional relationship between variables which is considered as the biggest advantage of this approach. Another advantage of this method is that it produces a lot of output for the relationship between the variables.[12] For example, it is possible to analyze this relationship more effectively with the help of impact-response functions and variance decomposition table. In the analysis process in the VAR model, the variables are first subjected to stationary analysis. The main reason for this is that the variables used in the analysis should not have a unit root. In addition, the variables are checked for autocorrelation and homoscedasticity. The ideal lag length is then determined. Afterwards, the model is established and the size of the relationship between the variables is identified.[13]

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[12] Edoardo Baldoni - Silvia Coderoni - Marco D'Orazio - Elisa Di Giuseppe - Roberto Esposti. "The Role of Economic and Policy Variables in Energy-Efficient Retrofitting Assessment. A Stochastic Life Cycle Costing Methodology", *Energy Policy* 129 (2019), 1207-1219.

[13] Zhongdong Yu - Wie Liu - Liming Chen - Serkan Eti - Hasan Dinçer - Serhat Yüksel, "The Effects of Electricity Production on Industrial Development and Sustainable Economic Growth: A VAR Analysis for BRICS Countries", *Sustainability* 11/21 (2019), 58-95.

2. 3. Analysis Results

First of all, unit root tests of the variables are performed. The main reason for this is that the variables to be used in the VAR model must be stationary. In this framework, ADF unit root test will be taken into account. According to the analysis results obtained, the variable will be considered stationary in case the probability value is below 0.05. On the other hand, if this value is above 0.05, it will be understood that the series is not stationary. In this case, the unit root test will be performed again by taking the first-row difference of the series. It is calculated that the probability of the economic growth variable is 0.0000 whereas this value is 0.9208 for the financial development variable. On the other hand, it is understood that the probability value of the oil prices variable is 0.4486. It means that the original form of economic growth variable can be used in the analysis process. However, the first differences of other two variables (financial development and oil prices) are calculated and it is defined that the probability values of them are lower than 0.05. Thus, the first differences of them are used in the analysis. After unit root test analysis, initial VAR model is established in our study to define optimal lag length. For this purpose, information criteria are considered such as final prediction error (FPE), Akaike information criterion (AIC), Schwarz information criterion (SC) and Hannan-Quinn information criterion (HQ). The details are given on Table 1.

Table 1: Optimum Lag Length Analysis Results

Lag	FPE	AIC	SC	HQ
0	4817580.	23.90135	24.04012	23.94658
1	40771.09*	19.12502*	19.68011*	19.30597*
2	51716.48	19.34340	20.31482	19.66006
3	83800.09	19.77816	21.16589	20.23052
4	91343.83	19.77069	21.57474	20.35877
5	102603.9	19.72274	21.94311	20.44653

As a result of the analysis, it is identified that the optimal lag is 1. Therefore, VAR model is restructured with the degree of 1. After that, the prerequisites of VAR analysis are also tested. Firstly, Cholesky normality test is used in normality analysis. The probability value is calculated as 0.5875. Because it is greater than 0.05, it is concluded that error terms are distributed normally. In the second stage of the study, autocorrelation analysis is examined. According to the VAR model rule, error terms should not be related to each other. For this purpose, LM test is also taken into account. The results of the analysis are given in Table 2.

Table 2: Autocorrelation Analysis

Lags	Prob
1	0.6201
2	0.4579
3	0.8678
4	0.3803
5	0.1861
6	0.4735
7	0.6364
8	0.9691

Table 2 indicates that all probability values are above 0.05. This situation concludes that there is no autocorrelation in this study. In other words, this study is suitable for VAR analysis with the second condition so far. The third prerequisite in this study is homoscedasticity. In other words, the distribution of variances is expected to be homogeneous. The probability value to be obtained here is expected to be over 0.05. Otherwise, it is understood that the variance of the error term of the analysis will not be

equal. The probability value is calculated as 0.5843 so that it is understood that there is no heteroscedasticity problem. In the next stage, AR graph is created. There are two points in this chart. These two points are expected to be in the circle for the model to be valid. Figure 1 gives information about this chart.

Figure 1: AR Graph

Inverse Roots of AR Characteristic Polynomial
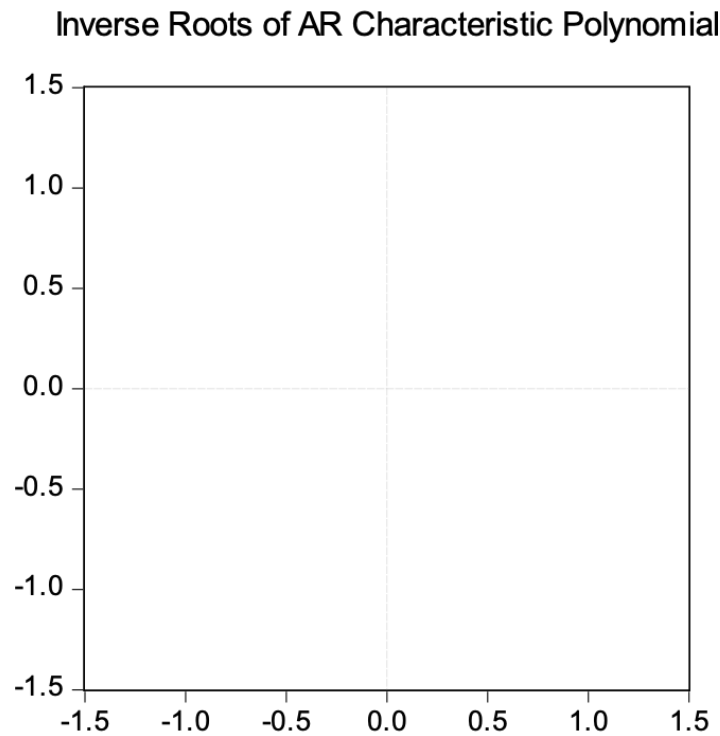
As can be understood from Figure 1, the two points mentioned in the results are in the circle. Therefore, it is concluded that the VAR model is suitable with the criterion of the AR character. After the specified analysis, the impact-response analysis of the model established is also included. In this study, three different models are established. And in each model, three different impact response graphs are created. The details are shared in Figure 2.

Figure 2: Impact-Response Graphs

Response to Cholesky One S.D. Innovations±2 S.E.
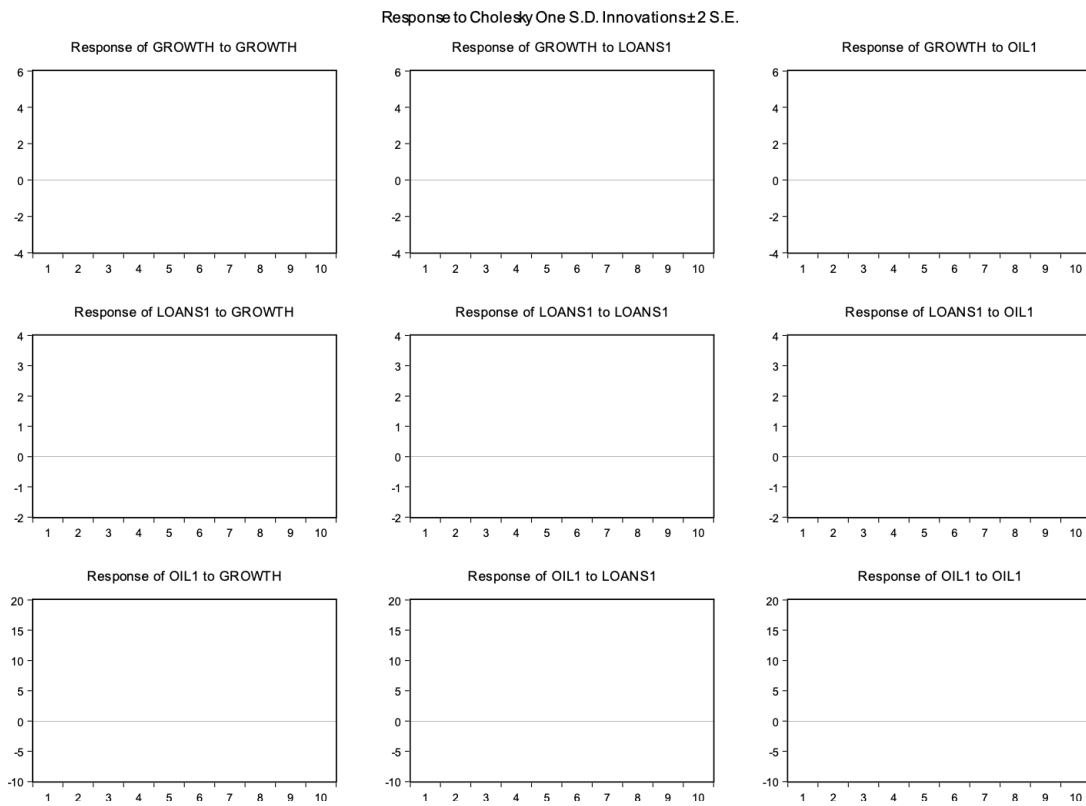
In the first impact response graph, the reaction of economic growth to economic growth is mentioned. As can be seen, this effect, which is positive at first, has been reset in the second period. It is obvious that while economic growth positively affects economic growth in the following year, this effect reaches zero in the second period. In other words, it is understood that economic growth has an impact on itself for only one period. In the second graph of the first row, the reaction of economic growth to loans is explained. Although the increase in loans in the first period did not increase economic growth, it is observed that loans increased in the second period. In other words, it is understood that the banks reflected to the economic growth after two periods since they gave credit to the system. Finally, when the effect of economic growth on oil prices is analyzed, it is seen that there is no effect in the first period. But later, it is seen that it turns into a negative effect. In other words, the increase in oil prices has a slightly lowering effect on the country's economy after the second period.

In the first graph of the second row of impact reaction graphs, the effect of loans on economic growth is examined. When the economy grows, it is understood that the credits increase periodically. However, this increase is reset in the second period. In other words, as the economy grows, banks tend to be more willing to give lends. However, it is also defined that this effect lasts only a year. With respect to the effect of

loans on loans, it is seen that the first period has a very serious effect and this effect continues until the fourth period and it is reset in the fourth period. As it can be understood from here, loans are determinant for themselves in the next period. In other words, while banks give a large amount of loans, they increase their loans based on this in the next period. But this effect is reset after its fourth year. Our last graph in the second row is the effect of loans on oil prices. Considering the blue line in the middle, it is understood that the loans did not react to oil prices at all. Therefore, it is seen that the loans are not seriously affected by oil prices.

Our first graph in the last row measures the response of oil prices to economic growth. As can be seen, it is understood that the blue color was five in the first period. This shows that when the economy grows by one unit, oil prices increase five times. As can be seen from this, this effect reaches zero in the second period, as the economy grows, people attach more importance to personal tools. In this case, it increases the demand for oil. Our second graph in the third row is the response of oil prices to loans, as seen in blue, is above zero. In other words, oil prices did not react to loans at all. In our last graph, oil is the reaction of prices to itself, and as can be seen, the effect of oil prices in the first period is fifteen. It seems that there was a very serious reaction compared to the previous figures. So, oil prices in Turkey are most affected by themselves. In other words, the rising trend in oil prices causes the price to increase and the decreasing trend to decrease further. Therefore, these graphs show that even in the event that oil prices systematic in Turkey. In other words, half of oil prices are affected by their own prices rather than variables.

As a result of impact-response graphs, it is identified that oil price increase causes the decrease in economic growth in the second year. This means that any sudden increase in the oil prices leads to economic growth negatively after 2 years. However, it is also determined that oil prices do not have significant impact on the financial development. In addition to the impact-response graphs, variance decomposition tables of the VAR model established are also examined. Since there are three different variables in the model we have established, three different models have been established. Variance decomposition table is created for each of these three different models. The variance decomposition table informs what percentage of a variable is explained by itself or other variables in future periods. In this study, it is examined up to ten periods. First, the variance decomposition table of economic growth will be examined in our table. These details are shared in Table 3.

Table 3: Variance Decomposition Tables

Variance Decomposition of Economic Growth				
Period	**S.E.**	**Economic Growth**	**Financial Development**	**Oil Prices**
1	4.317960	100.0000	0.000000	0.000000
2	4.603310	89.49240	8.341470	2.166129
3	4.626350	88.67412	9.175169	2.150711
4	4.628252	88.60485	9.241837	2.153315
5	4.628399	88.59944	9.246939	2.153626
6	4.628411	88.59902	9.247326	2.153652
7	4.628411	88.59899	9.247356	2.153654
8	4.628412	88.59899	9.247358	2.153654
9	4.628412	88.59899	9.247358	2.153654
10	4.628412	88.59899	9.247358	2.153654
Variance Decomposition of Financial Development				
Period	**S.E.**	**Economic Growth**	**Financial Development**	**Oil Prices**
1	3.106819	10.78511	89.21489	0.000000
2	3.454216	10.37689	89.51861	0.104502
3	3.483641	10.29049	89.55252	0.156989
4	3.485982	10.28201	89.55264	0.165351
5	3.486162	10.28133	89.55259	0.166082
6	3.486175	10.28128	89.55259	0.166139
7	3.486176	10.28127	89.55259	0.166143
8	3.486176	10.28127	89.55259	0.166144
9	3.486176	10.28127	89.55259	0.166144
10	3.486176	10.28127	89.55259	0.166144
Variance Decomposition of Oil Prices				
Period	**S.E.**	**Economic Growth**	**Financial Development**	**Oil Prices**

1	15.73549	10.87588	0.282689	88.84143
2	15.77014	10.91568	0.356582	88.72774
3	15.77098	10.91567	0.366000	88.71833
4	15.77105	10.91562	0.366773	88.71761
5	15.77105	10.91561	0.366832	88.71755
6	15.77106	10.91561	0.366837	88.71755
7	15.77106	10.91561	0.366837	88.71755
8	15.77106	10.91561	0.366837	88.71755
9	15.77106	10.91561	0.366837	88.71755
10	15.77106	10.91561	0.366837	88.71755

It is obvious that economic growth is fully explained by itself. In the second period, the explanatory power of the loans is 8% and the oil prices are 2%. Again, it is mostly explained by itself at a rate close to 90%. It is seen that this rate goes in parallel in ten periods. In general, the economic growth variable is explained by itself, 10% of it is explained by loans and 2% of it is explained by oil prices. It is understood that loans have little effect on economic growth. However, the impact of oil prices on economic growth is very low. One of the hypotheses of our study is that oil prices may have an impact on economic growth, but here it is seen that oil prices do not have a serious effect on economic growth. In the second variance decomposition table, the explanatory power of the loans is shown. As can be seen, 100% of the loans are not disclosed by themselves even in the first period. It explains 10% economic growth loans, 90% is explained by itself and there is no explanation for oil prices. This rate is similar in ten periods. As it can be understood from here, 90% of the loans explain itself, 10% of economic growth and oil prices have almost no effect.

Our final variance decomposition table is on oil prices. What affects oil prices, which constitutes the main hypothesis of our study, will be examined here. It is seen that oil prices were explained by 90% itself and 10% economic growth in the first period. However, it is understood that the loans do not have a serious effect on oil prices. This rate is similar in ten periods. In other words, oil prices mainly explain the economic growth by itself and 10% -11%. However, it is seen that loans do not have a long-term effect on oil prices. In summary, regarding the variance decomposition analysis results, it is identified that oil prices have low influence on financial development and economic

growth. These prices can explain approximately 2% of economic growth and 0.2% of financial development.

Following the variance decomposition table, details of the VAR model are shared below. As mentioned earlier, the relationship between three different variables is examined in the study. Therefore, three different models have been established. The equation in each model is written. Subsequently, the VAR models, which were established according to the analysis results obtained, are given together with the number of floors. After that, which floor numbers are meaningful will be examined. In this context, the table regarding the details of the variables is given below.

Economic Growth = -0.186052586249*Economic Growth(-1) + 0.466084600049* Financial Development(-1) - 0.0456798116607* Oil Prices(-1) + 4.94774081274 (1)

Financial Development = -0.21012284608*Economic Growth(-1) + 0.492397626028* Financial Development(-1) - 0.00752877715352*Oil Prices(-1) + 1.78141801406 (2)

Oil Prices = 0.0794617610591* Economic Growth(-1) - 0.16323950752*Financial Development(-1) + 0.0558884972268*Oil Prices(-1) + 1.03745964135 (3)

There are many different variables in the created VAR model. Table 4 will be used to determine which of these variables are meaningful. The point to be considered in this table is probability values. If this value is over 0.05, this variable is meaningless. However, if this value is below 0.05, the variable is considered to be meaningful.

Table 4: Details of Variables

Variables	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.186053	0.192205	-0.967990	0.3356
C(2)	0.466085	0.243554	1.913683	0.0588
C(3)	-0.045680	0.053898	-0.847529	0.3989

C(4)	4.947741	1.132128	4.370303	0.0000
C(5)	-0.210123	0.138294	-1.519396	0.1322
C(6)	0.492398	0.175240	2.809854	0.0061
C(7)	-0.007529	0.038780	-0.194141	0.8465
C(8)	1.781418	0.814578	2.186921	0.0313
C(9)	0.079462	0.700433	0.113447	0.9099
C(10)	-0.163240	0.887557	-0.183920	0.8545
C(11)	0.055888	0.196414	0.284545	0.7766
C(12)	1.037460	4.125695	0.251463	0.8020

In our analysis, firstly, it is seen that the probability value of the variable C4 is less than 0.05. When the equation is examined, it is seen that the variable C4 is a constant term. Therefore, there is no subject that is open to interpretation. After that, C6 value appears to be positive and significant. It is the previous value of the loan variable that describes the C6 loan variable. In other words, when it is understood that C6 is positive, the previous loan value affects the next loan value by 0.49. If we increase one unit of credit today, it will increase the amount of 49% credit after a period of time. After that, the C8 value is also significant. However, since there is a constant term in C8, it is not very open to interpretation. It is concluded that by looking at the details of the variables in the model, oil prices have no significant effect on economic growth and financial development.

DISCUSSION AND CONCLUSION

In this study, it is aimed to understand the impacts of oil prices on the economic growth and financial development. In this context, especially the studies conducted after 2015 are analyzed in the literature. During the selection period, the studies in journals scanned in the SSCI index are given priority. As a result of the literature review, many

different issues that may affect oil prices came to the fore. For example, some of the studies stated that volatility in the exchange rate affects oil prices. In contrast, some studies have argued that this volatility is only determinant on oil importing countries. Since oil importing countries are energy dependent countries, they have to obtain oil regardless of the price. Therefore, a possible exchange rate increase increases the price of oil and does not change the situation in these countries. In some studies, it is concluded that it affects the oil price in the countries stock market index. The stock market index in the country symbolizes the continuity and reliability of the country's financial market. Hence, it is identified that this situation is likely to be reflected in oil prices in case of a possible increase. Another study emphasized the political stability in the country. In other words, if a country cannot stabilize politically, the country's economy will be negatively affected. As a result, the credibility of the country has been determined to decrease. Oil prices will be higher in countries with low credibility.

In the analysis part of the study, the effect of oil prices on financial development and economic growth is examined. Turkey's oil prices, financial development and economic growth figures are included in the data analysis. In order to reach the goal, the model is created by considering the VAR method. Since there are different models for each variable, three different models are obtained in the analysis. In order for these data to be used in the VAR model, the variables must first be stationary. Therefore, the variables are firstly subjected to unit root test. According to the results of the analysis, variables with probability value below 0.05 will be considered stationary. As a result of the test, it is concluded that the economic growth variable is stationary, but the financial development and oil prices variables have unit root. In this regard, the first differences of these variables are considered in the analysis.

In the study, the first VAR model is established after the unit root test analysis. This VAR model is formed in order to find the optimal lag length. As a result, it is defined that the optimal delay length is 1. Therefore, a new VAR model has been established with the appropriate lag length of 1. Afterwards, the VAR model prerequisites are examined. These prerequisites are; normality, autocorrelation and homoscedasticity. After the normality test of the model in the study, it is found that the error terms distributions are normal. Additionally, LM test is used to determine whether there is autocorrelation between the variables. It is identified that there is no autocorrelation problem in the models. It is also found that there is no heteroscedasticity in the model. Under these results, an AR graft is created and it is found that the VAR model is meaningful.

While looking at the details of the variables, it is concluded that there is no significant relationship between oil prices with economic growth and financial

development. The main reason is that the related coefficients are not statistically significant. On the other side, regarding the results of impact response graphs, it is determined that oil price increase causes the decrease in economic growth in the second year. However, they do not have significant impact on the financial development. In addition to this condition, with respect to the analysis results of variance decomposition tables, it is identified that oil prices have low influence on financial development and economic growth. These prices can explain approximately 2% of economic growth and 0.2% of financial development. The results obtained here are also emphasized by many researchers in the literature. As an example, Albaity and Mustafa (2018) examined the effect of oil prices on macroeconomic variables. In this framework, countries in the Gulf region were included in the scope of the study. In this study, it is concluded that there is an important relationship between oil prices and economic growth. Caldara et al. (2019) also made an analysis with the VAR method and emphasized the same result.

Considering these results, it is indicated that the increase in oil prices in Turkey was has a negative impact on economic growth. Therefore, it is important to reduce volatility in oil prices in order to achieve economic growth in the country in a sustainable manner. Within this context, to reduce Turkey's energy dependence to other countries is vital. Turkey needs to take some actions to achieve this goal is concerned. As an example, exploration activities for energy resources in the country should be increased. The important issue in this process is the country's need for adequate technological equipment and competent personnel. Thanks to these issues, it is possible to perform energy exploration activities more effectively. On the other hand, the use of renewable energy sources will reduce its dependence on outside energy in Turkey. In this context, government incentives to make more use of these energy alternatives are important.

The most important limitation of this study is that the analysis is made only for Turkey. Therefore, it is very important to address different country groups in a future study. In this context, a comparative analysis between oil exporting countries and oil importing countries is thought to contribute significantly to the literature. Another important limitation of this study is that only the relationship between oil prices with economic growth and financial development is taken into account. In other words, other important variables related to the subject have been ignored. As can be understood from the results obtained from this study, the financial developments in Turkey, there are other outside factors affecting oil prices. Therefore, it is concluded that an analysis that takes into account other factors that may affect financial development will be beneficial.

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