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The Effect of World Oil Price on Türkiye's Exchange Rate

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ABSTRACT

Oil prices are used in international markets both as one of the key prices and as an indicator price for other energy sources other than oil. Especially in developing oil importing countries like Turkey, the relationship of this important input with the exchange rate has always been an interesting research topic. In this study, the relationship between oil prices and nominal exchange rate in Turkey is examined by causality tests using daily data set (total 5168 observations) for the period of April 03, 2013-April 03, 2023. The findings obtained from the analyzes indicate the existence of a unilateral causality relationship between the variables. This positive relationship indicates that there is a causality running from oil prices to the exchange rate. On the other hand, there was no causal relationship from exchange rate to oil prices. The results obtained show similar results with such articles made before in the literature.

Keywords: Energy Economics, Oil Price, Exchange Rate, Türkiye
JEL Classifications: E30, Q43, F31

1. INTRODUCTION

The rise in world oil prices has serious effects on almost every country. As a matter of fact, in our world where the trade cycle is experienced, the dollar is used as an important means of exchange. The increase in oil prices also reflects its own effect on the increase in the demand for dollars in the market and indirectly on the appreciation of the dollar. In this context, there are many studies in the literature to measure effects. There are a number of studies on this subject, either on different countries or on Turkey.

Studies on the relationship between oil price and exchange rate have been made in the literature, but these studies have reached different results according to the period and country in which they are examined. In this respect, the relationship between oil prices and exchange rates continues to be investigated with developing methods. In this context, the aim of the study is to examine the relationship between oil prices and the dollar/TL exchange rate in Turkey. The study is capable of contributing to the existing literature, as it is based on the method used in the analysis and current data. In this respect, it is aimed to give a current perspective to the relationship between the dollar/TL exchange rate and oil prices in Turkey.

Energy is one of the most frequently studied topics in the literature. It has been studied by different researchers with different variables. In a study conducted by Huseynli (2022), the relationship between tourism and renewable energy was investigated. In today's economies, energy, especially oil, is one of the most basic inputs used in production. In this respect, oil prices are both key prices in international markets and an indicator price for other energy resources other than oil (Altintaş, 2013). The rapid increase in the world population and the increase in energy consumption with the development of technology make it necessary to closely monitor the developments in this sector (Yaylalı and Lebe, 2012).

Petroleum and petroleum products have gained increasing importance in terms of the real economy since their use as industrial inputs. Especially after the 1973 oil crisis, this situation emerged more clearly in terms of countries. Frequent price changes in oil prices in recent years have revealed the necessity of focusing on its potential determinants and macroeconomic effects. Exchange rates, on the other hand, provide an idea about the competitiveness of economies at the global level. Due to these characteristics, changes in exchange rates and oil prices can have very important macroeconomic and financial consequences.

There are many theoretical and empirical studies investigating the link between oil prices and exchange rates, but it is difficult to take a clear approach due to the lack of consensus on the results. From a theoretical perspective, the relationship between oil prices and exchange rates can operate through more than one channel (Huang et al., 2021). Explaining the effect of oil prices on exchange rates; terms of trade channel and wealth effect channel stand out. The terms of trade channel emphasizes that the price of oil plays an environmental role influencing the terms of trade. Amano and Van Norden (1998) construct a simple two-sector model for tradable and non-tradable goods and show that oil prices are a major cause of persistent shocks in exchange rates. According to the terms of trade channel approach, if a country's economy is more dependent on imported oil than another country and the tradable sectors in that country are more sensitive to changes in oil prices than other sectors (non-tradable), an increase in oil prices will change that country's currency to the other country's currency. May lead to an appreciation in real terms relative to the unit. The opposite is true.

On the other hand, the potential importance of exchange rates in explaining changes in oil prices is also theoretically investigated. Based on the law of one price, Blomberg and Harris (1995) provide some useful information about the effects of exchange rates on oil prices. Considering that crude oil is the primary energy source that is traded internationally in US dollars, the depreciation of the dollar reduces the cost to international buyers, increases the demand for oil, and the increase in demand may cause oil prices to rise again.

After the 2008 Global Financial Crisis, the volatility of oil prices increased and their predictability decreased due to the decrease in OPEC's determination on the oil price and the global risks. The high course of oil prices means an increase in input costs for a country like Turkey, which is a net importer. This situation causes foreign exchange outflow from the country, increasing external deficits and increasing production costs, thus weakening the competitiveness of the country in exports. For this reason, the relationship between oil price and exchange rate is of serious importance for Turkey, which is dependent on foreign energy (Dücan and Şentürk, 2017).

Especially, developing countries are more dependent on energy when compared to developed countries importing oil and they have sectors where this energy is used intensively, so they can be seriously affected by changes in oil prices. For example, in case of an increase in oil prices; companies reduce their energy demands and buy less energy. Accordingly, factor (capital and labor) productivity may decrease, causing a decrease in national income. Increases in oil prices may also create an environment of uncertainty in the market and indirectly affect macroeconomic activities.

2. THEORETICAL BACKGROUND

2.1. Literature Review on Oil Prices and Exchange Rate

When the literature is examined, although applied studies on the relationship between oil prices and exchange rates are widely discussed, studies differ from each other in terms of country/ country groups, methods used and results. Petrol prices have a persuasive feature for both consumers, investors, and politicians (Huseynli et al., 2018). Therefore, oil prices have a major determining feature in international markets.

Huang et al. (2021), taking the monthly data of real oil prices and real exchange rates for the period of January 1997–July 2015, they classified 81 countries according to their net oil imports. Accordingly, oil importers show a significant negative bidirectional correlation for countries adopting free floating exchange rate systems, while oil exporters do not show a correlation between oil prices and exchange rates. In managed floating systems, exchange rates are predictive of oil prices for oil importers or exporters. It is emphasized that knowing these relationships can guide the development of government policy to prevent sudden and significant shocks caused by crude oil price and exchange rate movements.

Kisswani et al. (2019) examines the asymmetrical relationship between oil prices and exchange rates in selected Asian countries for the period 1970:Q1- 2016:Q4 with the non-linear ARDL (NARDL) approach. The article also explores the direction of the causality relationship between oil price and exchange rate using the Toda and Yamamoto causality test. Empirical results point to a long-term asymmetry relationship only for Indonesia and Malaysia, when structural breaks are taken into account. In addition, since there is a bidirectional causality between oil price and exchange rate in some countries, it can be said that the causality test findings are complex, since in some countries there is a unidirectional causality.

Lv et al. (2018) analyzed the nonlinear bidirectional dynamic relationship between exchange rates and oil prices by dividing 17 oil exporting countries into three groups according to their exchange rate regimes, using monthly data for the period 2000:1-2015:12, using Markov regime change vector autoregression (MS-VAR) model (or vector error correction model (MS-VECM)). The findings show that there is a significant negative bidirectional correlation between oil prices and exchange rates in countries with free floating exchange rate systems. It is also emphasized that the correlation between oil prices and exchange rates is weakened by high government restrictions. However, it is stated that the existence of a relationship in both directions cannot be completely ignored for managed floating exchange rate systems or fixed exchange rate systems.

In the study of Tiwari and Albulescu (2016), empirical relationships between the oil prices and exchange rates in the economies of India and the USA, for the period 1980: M1- 2016: M2, between the variables are investigated by using monthly data, continuous wavelet and asymmetric causality test. The findings show that the exchange rate causes the oil price in the long run, while the opposite is true in the short run. In addition, the results show that the Granger-causal relationship between the variables is nonlinear, asymmetric and indirect, which will help policy makers and firms make better strategic and investment decisions.

In the study of Reboredo and Rivera-Castro (2013), the relationship between oil prices and exchange rates was analyzed with the wavelet multi resolution method, with the help of daily data for the period of January 04, 2000 and October 07, 2011 in Euro zone countries. The findings show that oil prices and exchange rates are not related in the pre-crisis period. In addition, it was observed that oil prices and exchange rates were related during the crisis period. It is stated that these findings have important effects on risk management, monetary policies to control inflationary pressures and policy in oil exporting countries.

In the study of Chen and Chen (2007), the long-term relationship between real exchange rate and real oil prices in G7 countries is examined with the help of monthly data for the period 1972:1-2005:10, using panel data analysis techniques. The findings show that real oil prices can be the dominant source of real exchange rate movements and there is a link between real oil prices and real exchange rates. Panel regression estimates show that real oil prices have a significant power in predicting real exchange rates.

Nazlioglu and Soytas (2011) examined the relationship between oil price, dollar rate and agricultural commodity prices for the period January 1994-March 2010 in Turkey. The impulse response analysis showed that agricultural prices did not respond significantly to oil price and exchange rate shocks in the short run. Long-term causality analysis showed that the changes in oil price and the value of the Turkish Lira were transferred to the price of agricultural commodities. Therefore, the existence of direct and indirect effects of the agricultural commodity market on oil price changes in Turkey has been supported.

Gilbert (2010) showed by Granger causality test that GDP growth, monetary expansion and exchange rate fluctuations in 1970–2008 were the determinants of changes in agricultural prices. He also stated that oil prices and the dollar exchange rate are also important factors. In this context, he concluded that while the effect of oil prices changes over time, the dollar exchange rate has a consistent and relatively minor effect.

In general, different topics with energy have been researched. One of these is investments. Investments are also affected by oil prices. In a study conducted by Huseynli (2023), the causality relationship between economic growth, foreign investments, total capital increases in the country and oil and gas sector revenues were examined in Azerbaijan. As a result of the study, a bidirectional causality relationship was obtained between economic growth and foreign investments in Azerbaijan.

3. RESEARCH METHODOLOGY

3.1. Data Set

In previous studies in the literature, it is seen that monthly, quarterly, weekly, and daily data are used as data sets. The most sensitive information is the daily data, depending on the abundance of data. The data used in this study were also taken daily. The data set consists of daily data between the years April 03, 2013 and April 03, 2023. The necessary data for the study was obtained from the investing.com site.

3.2. Analysis Method

In the economics literature, there are various types of analysis to examine the long-run relationship between series. Traditional OLS, Engle and Granger (1987), Johansen (1991) and ARDL cointegration tests are the most used analysis examples in the literature. Traditionally, the Engle-Granger and Johansen tests are used for stationary series at the OLS level, and the ARDL cointegration test is used for stationary series of different orders. However, in case of structural break in at least one of the series or the applied model, ARDL limit test may give deviated results. To overcome this problem, Gregory and Hansen (1996) developed a test that examines the cointegration between the series by controlling the structural breaks in the model (Karadaş and Salihoglu, 2020).

The most frequently used cointegration tests in the literature are the two-stage Engle and Granger (1987) method based on the error term and the Johansen (1988) and Johansen and Juselius (1990) method based on the systems approach. To apply these methods, all variables in the model should not be stationary at the level I (0) and should become stationary when their first difference is taken (Pesaran et al., 2001). Pesaran and Shin (1995) and Pesaran et al. (2001) eliminates the boundary test approach. This new method is called ARDL (Autoregressive Distibuted Lag) approach.

The concept of stationarity means that the mean, variance and autocovariance of a series do not change in different time periods. It is important that the series be stationary to avoid false relationships between the series and to prevent the effect of a shock from being permanent.

Different tests can be used for stationarity research. The most basic of these are the Dickey-Fuller and Augmented Dickey-Fuller Test (1979, 1981). The Phillips-Perron test is another widely used test that does not consider structural break. Although its operation is the same as the ADF test, the lag structure of the dependent variable added to the right side of the equation to eliminate the autocorrelation problem is determined by the Newey-West estimator.

To search for causality between series, stationarity information is needed. If the series are stationary of the same order, a cointegration relationship can be sought between them. If a cointegration relationship is not observed, causality can be investigated in the order that the series are stationary. Altinay and Karagol (2005) stated that it would not be appropriate to investigate the cointegration relationship for trend stationary series with structural break. Instead, they suggested that it would be correct to de-trend the series - considering the breakout period - and then apply the standard Granger causality test.

On the other hand, there are models in which relationships between series can be observed without the need for stationarity and cointegration a priori information. Among these models, the Toda-Yamamoto Method can be mentioned. The first step in the Toda-Yamamoto Method is to determine the appropriate delay level (p) in the VAR model. In the second step, the integrated level (d_{max}) of the variable with the highest integration is added to the delay p. In the third step, the LSM model is estimated on the original values of the series for the p+d_{max} delay.

Before proceeding to the unit root search for the series, the graphs are given in the Figures 1 and 2 below. The graphical view shows that the series are not stationary.

4. ANALYSES AND RESULTS

The function used in the mathematical determination of the relationship between oil prices and the Dollar/TL exchange rate is expressed as follows:

$$Y = f(P,R) \quad (1)$$

where P is oil prices; R represents the Dollar/TL rate. When the function is rewritten, the following equation is obtained.

$$Y = \beta 0 + \beta 1 P + \beta 2 R \quad (2)$$

In this part of the study, 03.04. The effect of world oil prices on the USD/TL exchange rate in Turkey in the 2013-03.03.2023 periods is tested using the Granger causality test.

To determine the most appropriate equation for data analysis, it is necessary to check whether the time series used are stationary. Because it is known that many economic time series contain unit root. In other words, it is known that the economic time series contains a stochastic trend, and its average value can change over time. For this reason, the validity of the hypotheses put forward may disappear by ignoring this problem (Takım, 2010).

If a time series is stationary, its mean, variance and covariance do not change over time. The constant mean, variance and covariance of a time series is defined as weak stationarity, and covariance is also expressed as stationarity or second-order stationarity (Darnell, 1994). This is also known as stationarity in a broad sense. If the common and conditional probability distribution of a stochastic process does not change over time, this series is called strongly stationary (Charemza and Deadman, 1993). In general, the concept of covariance stationarity is sufficient when applying.

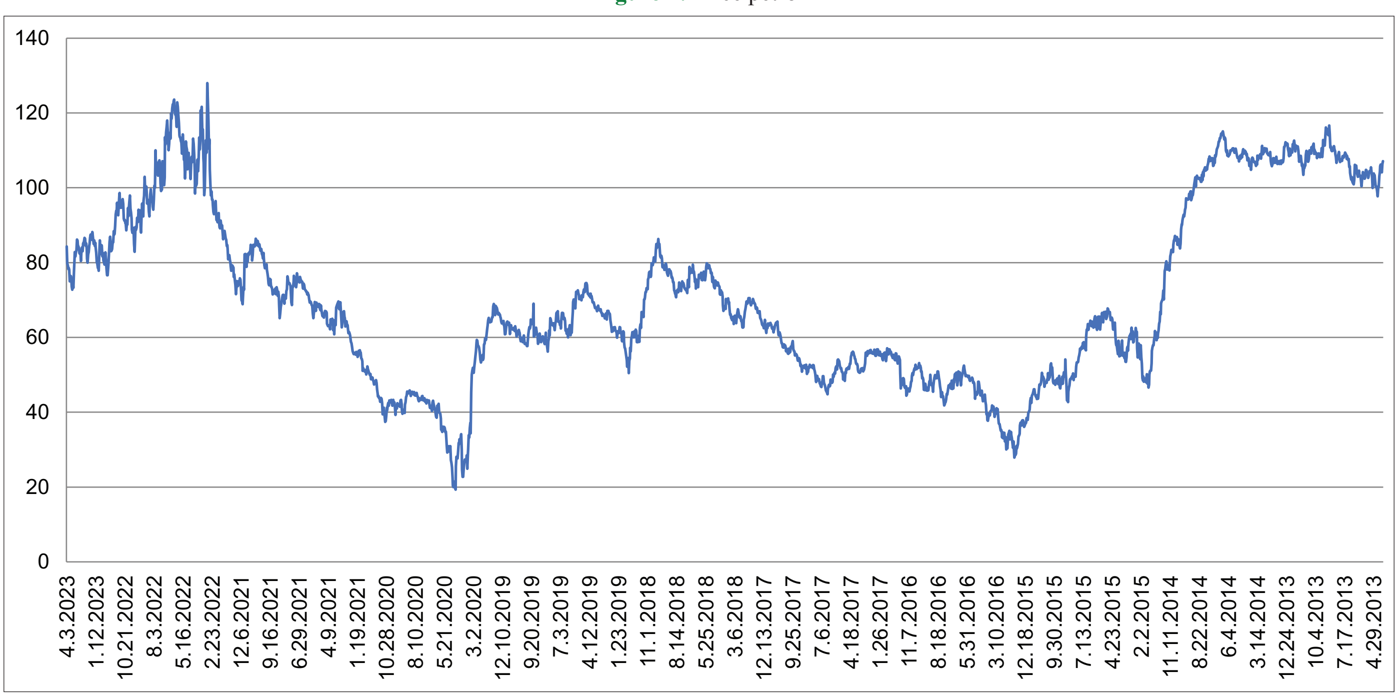
The stationarity tests of the data related to the data set used in the study were tested with the help of ADF criteria. It has been observed that the data are not stationary at the level of the level and the information about the data is given in Table 1.

Dickey-Fuller and Extended Dickey-Fuller tests, which are used to detect the presence of a unit root, are the most well-known tests used to determine the stationarity of time series. The standard Dickey-Fuller test assumes of random and homogeneous distribution of error terms. Since the error term can sometimes be

Table 1: Level values of series

ADF test resault		Oil prices		USD/TL rate	
		t-statistics	Possibility	t-statistics	Possibility
ADF testing statistics		−1.381510	0.5929	−2.191648	0.2095
Test critical values	1%	−3.432689		−3.432699	
	5%	−2.862459		−2.862464	
	10%	−2.567304		−2.567307	

Figure 1: Price petrol



Source: Investing.com

distributed in the form of different variances or serial correlations, this test was developed to cover all cases and was called the Extended Dickey-Fuller test.

Macroeconomic time series are generally not stationary. Series with this feature are made stationary by taking their first or second differences or logarithms. There are many tests used to detect stationarity. ADF (Augmented Dickey-Fuller), PP (Phillips-Perron) and KPSS (Kwiatkowski-Phillips-Schmidt-Shin) tests are generally used in the stability analysis of economic time series. In this study, the stationarity of the data of the variables is tested using Dickey-Fuller and Extended Dickey-Fuller unit root tests (Büyükakın et al., 2009). As a result of the ADF test, it was determined that the data were stationary in the first order, and the information about the results is given in Table 2.

Table 2: Stationarity level of first order series

ADF test resault		Oil prices		USD/TL rate	
		t-statistics	Possibility	t-statistics	Possibility
ADF testing statistics		−51.35970	0.0001	−18.21076	0.0000
Test	1%	−3.432690		−3.432699	
critical	5%	−2.862459		−2.862464	
values	10%	−2.567304		−2.567307	

Tables 1 and 2 show the ADF unit root results. These results need to be known in making Granger causality analysis. Then, the process followed by Lutkepohl (1993) was adopted to determine the optimum lag length. 5 different criteria [(likelihood ratio (LR), final prediction error, Akaike information (AIC), Schwarz information (SIC), and Hannan-Quinn (HQ)] used to determine the optimum lag length for VAR were used. The optimum lag length was found to be 7. The results of the optimum lag lengths for the VAR model are shown in Table 3 below.

After applying the necessary assumption tests, the Granger causality test was applied to determine whether there is a causality between the data. Information on causality is given in Table 4.

Table 3: Appropriate delay length

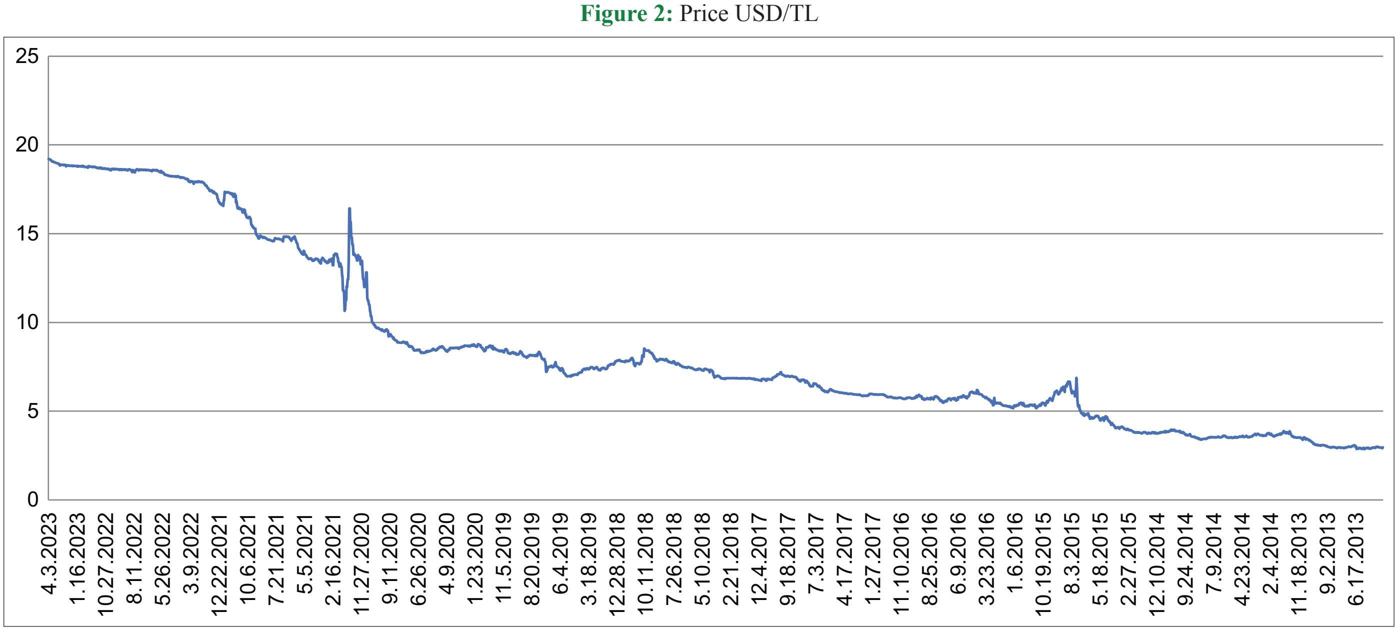
Lag	LogL	LR	FPE	AIC	SC	HQ
0	−19482.68	NA	12734.87	15.12785	15.13240	15.12950
1	−2580.253	33765.48	0.025533	2.007960	2.021596	2.012903
2	−2553.261	53.87867	0.025081	1.990110	2.012835*	1.998348*
3	−2548.435	9.626295	0.025065	1.989468	2.021283	2.001001
4	−2542.837	11.15708	0.025034	1.988228	2.029133	2.003055
5	−2533.322	18.94825	0.024927	1.983946	2.033941	2.002069
6	−2520.726	25.06540	0.024761	1.977272	2.036357	1.998690
7	−2515.218	10.95273*	0.024732*	1.976101*	2.044276	2.000814
8	−2512.962	4.480661	0.024766	1.977455	2.054721	2.005464

*Indicates the appropriate lag length for the relevant test

Table 4: Granger causality test

Hypotheses	F-value	P-value	Decision at 1% significance level
There is a causality from oil prices to USD/TL rate	0.721494	0.0308	Accepted
There is a causality running from the dollar/TL rate to the petro prices	1.198776	0.5491	Rejected

Figure 2: Price USD/TL



Source: Investing.com

As can be seen from the table, there is a one-sided causality relationship between the data. The developments in world oil prices cause the dollar/TL rate to change in the Turkish economy, in other words, the TL's depreciation against the dollar. This is an expected result, especially for a country that is dependent on foreign countries in terms of energy. The fact that world trade is carried out in dollars increases the demand for dollars in case of an increase in oil prices. This situation causes the appreciation of the dollar worldwide.

It has been determined that a change in the dollar/TL exchange rate has no effect on world oil prices. In other words, there is no causality from exchange rates to oil prices in Turkey.

5. DISCUSSION AND CONCLUSION

Oil prices are used both as one of the basic prices and as an indicator price for energy sources other than oil in international markets. Especially in developing oil importing countries such as Turkey, the relationship of this important input with the exchange rate has always been an interesting research topic. The relationship between oil prices and exchange rate in Turkey, triggering this situation for the period of April 03, 2013 to April 03, 2023. As a result, it has been interpreted that there is a unilateral causality relationship between the study variables. This positive relationship shows that there is a causality from oil prices to the exchange rate. This is an expected result for a country that consumes energy, especially in energy. On the other hand, no causality relationship was found from exchange rate to oil prices. The results obtained show similar results with previous articles of this type in the literature.

Huang et al. (2021), taking the graphs of real oil prices and real exchange rates for the January 1997-July 2015 periods, they classified 81 countries according to their net oil imports. Accordingly, oil importers face a significant negative bidirectional for the countries that adopt the free-floating exchange rate system, while oil exporters do not show a limitation between oil prices and exchange rates.

Kisswani et al. (2019), 1970: Q1-2016: Q4 selected Asian countries are examined with ARDL (NARDL) treatment, which does not have asymmetrical relationship variables between oil prices and exchange rates. The causality test is also complicated, since in some countries there is a bidirectional causality between the oil price and the exchange rate, and in some countries, there is one-way causality.

Lv et al. (2018) analyzed the bidirectional dynamic relationship between exchange rates and oil prices, using monthly data for the period 2000:1- 2015:12, using the Markov regime amplification vector, by separating three groups according to the exchange rate regimes of 17 oil exporting countries. autoregression (MS-VAR) model (or vector error correction model (MS-VECM)). The findings show that there is a negative bidirectional relationship between oil prices and exchange rates in countries with free floating exchange rate system. It is also emphasized that the relationship between oil prices and exchange rates is weakened by high government maintenance.

In addition, the high course of oil prices and the trainings it enters have a meaning for a country like Turkey that is a net importer. This situation causes export output in the country, increase in external deficits, and increase in production volumes. For this reason, the relationship between oil price and exchange rate has a serious couple for Turkey, which is energy dependent (Dücan and Şentürk, 2017).

REFERENCES

Altinay, G., Karagol, E. (2005), Electricity consumption and economic growth: Evidence from Turkey. Energy Economics, 27(6), 849-856.

Altintaş, H. (2013), Türkiye'de petrol fiyatları, ihracat ve reel döviz kuru ilişkisi: ARDL sınır testi yaklaşımı ve dinamik nedensellik analizi. Uluslararası Yönetim İktisat ve İşletme Dergisi, 9(19), 1-30.

Amano, R.A., Van Norden, S. (1998), Exchange rates and oil prices. Review of International Economics, 6(4), 683-694.

Blomberg, S.B., Harris, E.S. (1995), The commodity-consumer price connection: Fact or fable? Economic Policy Review, 1(3), 20-30.

Büyükakin, F., Bozkurt, H., Cengiz, V. (2009), Türkiye'de parasal aktarimin faiz kanalinin granger nedensellik ve toda-yamamota yöntemleri ile analizi. Erciyes Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 33, 101-118.

Charemza, W.W., Deadman, D.F. (1997), New Directions in Econometric Practice. United Kingdom: Edward Elgar Publishing.

Chen, S.S., Chen, H.C. (2007), Oil prices and real exchange rates. Energy Economics, 29(3), 390-404.

Darnell, A.C. (1994), A Dictionary of Econometrics. England: Bodmin-Cornwall.

Dücan, E., Şentürk, M. (2017), Döviz kuru ve petrol fiyati ilişkisi: Küresel finans krizi sonrasi deneyimler. In: Koç, S., Genç, S.Y., Çolak, K., editors. Dünden Bugüne Ekonomi YaziYazıları. Kocaeli: Umuttepe Yayınları, p53-64.

Engle, R.F., Granger, C.J.W. (1987), Cointegration and error correction representation, estimation, and testing. Econometrica, 55, 251-276.

Gilbert, C.L. (2010), How to understand high food prices. Journal of Agricultural Economics, 61(2), 398-425.

Gregory, A.W., Hansen, B.E. (1996), Residual-based tests for co-integration in models with regime shifts. Journal of Econometrics, 70(1), 99-126.

Huang, B.N., Lee, C.C., Chang, Y.F., Lee, C.C. (2021), Dynamic linkage between oil prices and exchange rates: New global evidence. Empirical Economics, 61, 719-742.

Huseynli, B. (2022), The role of renewable energy in the development of the tourism sector. African Journal of Hospitality, Tourism and Leisure, 11(6), 1924-1936.

Huseynli, B. (2023), Causality relationship between the development of the oil and gas sector and foreign investments. International Journal of Energy Economics and Policy, 13(2), 404-409.

Huseynli, B., Engizek, N., Kurtuluş, S. (2018), Tüketicilerin fiyat taktiklerinin ikna kabiliyeti ile ilgili bilinç düzeyi ölçeğinin Türkçeye uyarlanması. Yildiz Social Science Review, 4(1), 65-78.

Johansen, S., Juselius, K. (1990), Maximum likelihood estimation and inference on cointegration--with applications to the demand for money. Oxford Bulletin of Economics and Statistics, 52(2), 169-210.

Johansen, S. (1991), Estimation and hypothesis testing of cointegration vectors in Gaussian vector autoregressive models. Econometrica: Journal of the Econometric Society, 1551-1580.

Johansen, S. (1995), Identifying restrictions of linear equations with applications to simultaneous equations and cointegration. Journal of Econometrics, 69(1), 111-132.

Karadaş, H.A., Salihoglu, E. (2020), Seçili makroekonomik değişkenlerin konut fiyatlarina etkisi: Türkiye örneği. Ekonomik ve Sosyal Araştırmalar Dergisi, 16(1), 63-80.

Kisswani, K.M., Harraf, A., Kisswani, A.M. (2019), Revisiting the effects of oil prices on exchange rate: Asymmetric evidence from the ASEAN-5 countries. Economic Change and Restructuring, 52, 279-300.

Lv, X., Lien, D., Chen, Q., Yu, C. (2018), Does exchange rate management affect the causality between exchange rates and oil prices? Evidence from oil-exporting countries. Energy Economics, 76, 325-343.

Nazlioglu, S., Soytas, U. (2012), Oil price, agricultural commodity prices, and the dollar: A panel cointegration and causality analysis. Energy Economics, 34(4), 1098-1104.

Pesaran, M.H., Shin, Y. (1995), An autoregressive distributed lag modelling approach to cointegration analysis. Vol. 9514. Cambridge, UK: Department of Applied Economics, University of Cambridge.

Pesaran, M.H., Shin, Y., Smith, R.J. (2001), Bounds testing approaches to the analysis of level relationships. Journal of Applied Econometrics, 16(3), 289-326.

Reboredo, J.C., Rivera-Castro, M.A. (2013), A wavelet decomposition approach to crude oil price and exchange rate dependence. Economic Modelling, 32, 42-57.

Takim, A. (2010), Türkiye'de GSYİH ile ihracat arasındaki ilişki: Granger nedensellik testi. Atatürk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 14(2), 315-330.

Tiwari, A.K., Albulescu, C.T. (2016), Oil price and exchange rate in India: Fresh evidence from continuous wavelet approach and asymmetric, multi-horizon Granger-causality tests. Applied Energy, 179, 272-283.

Yaylalı, M., Lebe, F. (2012), İthal ham petrol fiyatlarinin Türkiye'deki makroekonomik aktiviteler üzerindeki etkisi. Marmara Üniversitesi İktisadi ve İdari Bilimler Dergisi, 32(1), 43-68.