THE IMPACT OF CURRENCY DEPRECIATION ON EXPORTS: AN AUTOREGRESSIVE DISTRIBUTED LAG APPROACH FOR TURKISH LIRA

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ARTICLE INFO

Original Scientific Paper
Received: 15.05.2023
Revised: 19.06.2023
Accepted: 21.06.2023

DOI 10.7251/ACE2338093O
UDC
336.77/.78:339.743

Keywords: *currency depreciation, exchange rate, export, import, ARDL*

JEL Classification: F31, F14, C22

ABSTRACT

Turkey experienced many economic crises during the 90s and 2000s, and international trade activities changed drastically as the Turkish currency "Lira" fluctuated severely. The Turkish lira has depreciated rapidly against foreign currencies in recent years, affecting Turkey's international trade activities. The research uses Autoregressive Distributed Lag (ARDL) bounds testing to investigate the effect of the Turkish Lira depreciation on Turkish exports from 1990 to 2020. The findings suggest that the exchange rate is related to exports in both short and long run. In contrast, the inflation rate has a negative and insignificant long run influence on exports, but a negative and significant short run effect. Furthermore, imports have a negative and insignificant impact in the long run, while exports have a positive and significant effect in the short run. In the long run, the deposit interest rate is positive but insignificant at 1 percent and 5 percent significance levels. These results suggest that Turkey should produce its intermediate goods in anticipation of the high exchange rate and export high-value-added technology-intensive products to eliminate the dependency of Turkey's exports on imports.

1. INTRODUCTION

Integrating with the global economy assists countries in increasing economic growth and development while decreasing poverty. With the foundation of the World Trade Organization (WTO) in the early 1990s, the process of trade liberalization advanced, and developing nations, in particular, became considerably more significant in global trade, substantially raising their incomes (IMF, 2001). Yet, trade liberalization has caused significant issues with the exchange rate throughout the years.

The first effect for any economy is that an inflated exchange rate leads to a balance of payments deficit since trade liberalization causes import prices to fall and import volumes to increase.

If export production reacts with a slight lag to more favorable incentives and if trade policy removes an anti-export bias, countries are likely to experience balance of payments deficits and overvalued currency real exchange rates. If the currency's real exchange rate continues to be overvalued, it could become unsustainable to discriminate against export (Collier & Gunning, 1992). On the other hand, a sustained excessive depreciation of the currency after trade liberalization could unnecessarily increase import prices for producers and consumers, reverting some of the pre-liberalization anti-export biases back into production. A chronic over-depreciation of a currency as a result of trade liberalization, on the other hand, may raise import prices for both producers and consumers, restoring part of the output's pre-liberalization anti-export bias.

Foreign trade tactics are crucial for growing economies such as Turkey. Turkey, which began a revolutionary trade transformation process in 1980, transitioned its trade liberalization policies within the context of the post-1980 liberalization trend (Utkulu & Seymen, 2004). Turkey's trade activity has also increased after the adoption of the Customs Union Decision in 1995. As a result, Turkey removed custom taxes on industrial items from the European Union (EU).

During the 1990s and 2000s, Turkey faced several economic crises, and foreign trade activity altered dramatically as the Turkish currency "Lira" fluctuated dramatically. From 1970 to 2020, the proportion of intermediate and investment products in total imports in Turkey varied between 80% and 90%. In 2020, roughly 75% of all imports were intermediate products, with the remaining 15% being investment items. Because the import of intermediate products is required for increased production and economic growth, the import of these commodities is highly sensitive to price variations. Despite rising investment goods prices, these items must be imported to ensure production continuity. As a result, given the wide range of imported goods, it is difficult for the actual exchange rate to have an influence on imports. As a result of the variety of items in imports, the actual exchange rate has a tough time influencing imports. Because consumer items account for almost half of overall exports (40% in 2020), the actual exchange rate may have a greater impact on exports. Yet, because intermediate and investment goods account for nearly 60% of total exports, and imports of intermediate and investment goods are required for the manufacturing of these items, imports are unavoidable for increased production and exports. As a result, the effect of the real exchange rate on exports is expected to be bigger than the effect on imports in the short run (Çatalbaş, 2021).

In recent years, the Turkish lira has depreciated fast against foreign currencies, harming Turkey's international commercial activity. The primary goal of this research is to examine the economic consequences of the Turkish lira's depreciation on international trade. This study specifically intends to:

- analyze the trend and pattern in the exchange rate connected to Turkey's international trade operations; and
- evaluate the significance of Turkish Lira indicators in the Turkish trade process.

Unlike the existing literature about the exchange rate-trade relationship in Turkey, the study adds other important variables, such as deposit interest rate and inflation, to the model. In general, in countries where price stability is unstable and prices tend to increase, the directing of exports to other countries causes a decrease in export rates. However, it paves the way for the import of these goods from other cheap countries and increases imports. Because Turkey's final exports are dependent on importing raw material and semi-finished goods, the effect of inflation is especially crucial to be examined. Besides, monetary policy decisions are effective on exchange rate. For this reason, the deposit interest rate has been added to the model.

This paper is divided into the following sections: the second and third section examines the theoretical literature and empirical literature, respectively; part four covers the estimation method used in the analysis; section five includes the findings and discussion, while section six includes the conclusions and policy recommendations.

2. THEORETICAL LITERATURE REVIEW

Currency depreciation is generally defined as the decline in the value of a currency at its exchange rate relative to other currencies. Although devaluation and depreciation are separate phenomena, the main impact on a currency remains the same. Both lead to a devaluation of the national currency in terms of foreign currency. Therefore, both benefits will be broadly similar (Bhatia, 2022).

There are several ideas on how devaluation and depreciation impact trade balance. In its most basic form, "classical trade theory" refers to trade in goods and services using the real exchange rate. All other factors held constant, trade theory argues that exchange rates can affect an economy's imports and exports (Adeyemi & Oseni, 2021).

Lerner (1944) extended the classical trade theory by considering the price elasticity of import and export demand as essential factors for assessing the impact of exchange rate fluctuations on the trade balance. Increased exports and decreased imports as a result of currency depreciation may not always imply a trade balance adjustment or improvement. According to the "exchange rate elasticity approach" (Krueger, 1983), transactions made during a depreciation or devaluation may dominate a short-term trade balance adjustment. That is, the trade balance initially worsens during the 'contract period' until the volumes of exports and imports adjust. Export and import elasticity increases with time, quantities respond to changing effective prices, and the trade balance improves. According to Williamson (1983), higher import costs due to devaluation may result in the higher local price of non-traded commodities. In general, inflation increases the effective real exchange rate, reducing the possibility of an improvement in the trade balance.

A depreciation or devaluation diminishes the real money supply, resulting in an excessive demand for money, according to the monetary approach to the exchange rate. This leads to stockpiling and increased trade balance (Upadhyaya & Dhakal, 1997). Krugman (2016) also argued that the real exchange rate is essential for correcting trade balances and significantly influences commerce. Devaluation is especially critical when capital inflows are unsustainable. He criticizes "elasticity pessimism" which maintains that trade flows do not respond to price signals and currency devaluation.

Because the theoretical overview does not provide a clear response concerning the relationship between currency depreciation and international trade, an overview of empirical research is required, which is the focus of the next section.

3. EMPIRICAL LITERATURE REVIEW

There is no consensus in the empirical literature examining the relationships between exports, imports and real exchange rates. There is no association between these variables in many studies. In many studies, sometimes very significant relationships were found among these variables while sometimes no significant relationships were found among them. In Armenia, for example, Barseghyan & Hambardzumhyan (2017) inspected the effect of exchange rate changes of Armenian exports on its major trading partner between 2007 and 2016. They accepted that exchange rate changes will have a significant negative impact on exports in both short and long term. Kumar, Begam & Nargis (2020) examined the impact of currency depreciation on exports of SAARC countries - Bangladesh, India, Pakistan and Sri Lanka from 1981 to 2017. The panel ARDL

model revealed a reverse relationship between the currency depreciation and exports in the long run, as well as a significant role for ECM in the short run. Contrary to Kumar, Begam & Nargis (2020), Alemu & Lee (2014) found no evidence for the effect of depreciation to improve trade balance for 14 Asian economies.

Oluitan, Anifowose & Arokoyo (2021) analyzed the impact of currency fluctuations on the export revenue of the selected African countries from 1990 to 2019. For the estimation of the variables, GMM is applied. They revealed that the inflation rate has a positive, but without significance effect on the export revenue of the selected countries. Dilanchiev & Taktakishvili (2021) used monthly GEL exchange rate data from May 2006 to April 2020 to examine the impact of the deprecation of the Georgian lari on exports. In this study, an ARDL model was applied. They observed that currency depreciation has a negative long-run effect on exports. The findings show that the influence of the exchange rate on Georgian exports reveals inelastic demand for Georgian export goods. Adeyemi & Oseni (2021) investigated the association between currency depreciation and Nigerian trade balance. Using the ARDL model, the authors discovered that currency depreciation had a positive and significant influence on Nigeria's trade balance from 1986 to 2018. However, Genemo (2017) asserted that currency depreciation would affect the trade in African countries negatively.

From a different point of view, Brun, Gambetta & Varela (2022) examined why exports respond to exchange rate depreciations slowly and why they act after exchange rate appreciations quickly for Pakistan's economy. They found that the sluggish reaction to depreciations stems from three different channels - information, supply constraints and pricing to the market.

In the extant literature, several studies about the currency depreciation-trade nexus give mixed results in Turkey. For example, Gül & Ekinci (2006), concluded that there is no causal relationship from the real exchange rate to imports and exports. Barışık & Demircioğlu (2006) argued that there is an existence of a weak nexus between the exchange rate regime and export-import. Ordu (2013) investigated the sensitivity of Turkish trade deficit to fluctuations in real exchange rates. The author revealed that trade deficit has a tendency to constantly grow despite longer devaluation periods. Thus, foreign exchange policy could not establish a positive trade balance. Barak & Naimoğlu (2018) used ARDL analysis to evaluate the international trade volume and exchange rate movements of the vulnerable five nations, including Turkey. The study discovered a positive and substantial association between foreign trade volume and exchange rate in both long and short run.

Among the newest studies, Sünbül (2021), for example, used monthly data from January 2013 to July 2020 to study the real effective dollar sales rate and Turkey's import and export connection with ARDL. The author determined a long run negative relationship between the exchange rate of the dependent variable and the imports of the independent variables. The study discovered a positive and substantial association between foreign trade volume and exchange rate in the long and short run. There is also a positive relationship with exports. Çatalbaş (2021) examined the long and short-term relationships between exports, imports, and the Turkish real exchange rate using quarterly data from January 1990 to March 2019. The vector error correction model (VECM) was used to confirm the long-term link between the series, while the Granger causality test was used to analyze the short-term relationship. At the 1% significance level, the Granger causality test indicated a two-way causation relationship between real exchange rate and export and a one-way causality association between import and export and import and real exchange rate. Furthermore, it was discovered that short-run deviations in the series were stabilized in the long run. Dinçer, Shingal & Tekin-Koru (2022) applied a gravity model using a firm-based database of Turkish companies to observe the exchange rate - trade relationship from 2003 to 2015. They found that the depreciation of the lira was related to an increase in the number of Turkish exports. However, this association can differ from sector to sector in Turkey. Finally, Kopuk & Mecik (2022), analyzed the effect of depreciation on Turkey's imports and exports after 2008 global crisis from the first quarter of 2008 to the last quarter of 2020. They applied Augmented Dickey-Fuller (ADF), Phillips Perron (PP) and Zivot-Andrews (ZA) for unit root tests and short-long term coefficient estimations; Vector Error Correction Model (VECM), Dynamic Least Squares Method (DOLS) and Fully Modified Ordinary Least Squares Method (FMOLS) methods. They revealed that real effective exchange rate decreased exports both in the short and long run. They also pointed out that there is a unidirectional causality from inflation to exports.

4. DATA AND METHODOLOGY

4.1 Data Set

This study section investigated the data sources, models, and econometrics techniques employed. The study relied on yearly time series data obtained from secondary sources. It involved annual data for Turkey on export rate (as a percentage of GDP), exchange rate, inflation rate, deposit interest rate, and import rate (as a percentage of GDP), which are all collected for the period spanning from 1990 to 2020. The information was obtained from the Turkish Central Bank

Bulletin and the World Bank. The logarithm of all series was taken in order to purify the series from small fluctuations and make them linear. Accordingly, LEXP denotes the average export rate, LDEPO represents the deposit interest rate, LIMP symbolizes the import rate, LEXC indicates the exchange rate and finally LINF denotes the inflation rate.

Table 1 summarizes the first descriptive statistics of our series. It can be observed that LEXP is 3.09 per cent with the standard deviation 0.21 per cent and maximum of 3.48 per cent. Besides, LDEPO, LIMP, LEXC and LINF have a mean value of 3.47 per cent, 3.22 per cent, -0.64 per cent, and 3.09 per cent respectively. LEXP, LDEPO, LIMP, and LINF have probability values greater than 0.05. This suggests that the variables are normally distributed. The distributions of LDEPO and LINF are somewhat right-skewed, whereas the distributions of other series are slightly left-skewed. LDEPO, LIMP, and LINF have kurtosis values of less than 3. This suggests that the distribution is platykurtic. LEXP and LEXC have kurtosis greater than 3. This suggests that the distribution is leptokurtic.

Table 1. Descriptive statistics of the data used

	LEXP	LDEPO	LIMP	LEXC	LINF
Mean	3.092030	3.473865	3.223078	-0.645797	3.096218
Median	3.135755	3.188788	3.262472	0.354873	2.719979
Maximum	3.4886282	4.474959	3.400831	1.948280	4.656053
Minimum	2.592639	2.592041	2.940695	-5.948405	1.832581
Std. Dev.	0.219035	0.686015	0.144500	2.222829	1.029809
Skewness	-0.870373	0.203207	-0.558553	-1.144493	0.239664
Kurtosis	3.618761	1.382927	1.975208	3.083327	1.292316
Jarque-Bera	4.408543	3.590959	2.968412	6.776604	4.063507
Probability	0.110331	0.166048	0.226682	0.033766	0.131105
Sum	95.85294	107.6898	99.91543	-20.01972	95.98277
Sum Sq. Dev.	1.439295	14.11850	0.626405	148.2291	31.81518
Observations	31	31	31	31	31

Source: Author's compilation

4.2 Methods

Many unit root tests are used in the literature to check for the stationarity of the series. Augmented Dickey Fuller ADF (Said & Fuller, 1984) test has been used commonly for this purpose.

Table 2. Unit Root Test

	Augmented-Dickey Fuller Unit Root Test		
Country	Variables	Level	1st Difference
Turkey	LEXP	1.094469	-5.031651*
	LDEPO	-0.652165	-5.449138*
	LIMP	-2.018493	-5.769450*
	LEXC	-2.987565*	
	LINF	-0.990364	-4.657942*

Note: * denotes that the series become stationary at 1 % level of significance
Source: Author's calculations

The model we use for the data will be an Autoregressive distributed lag ARDL model (Pesaran, Shin & Smith, 2001). This approach is considered superior to a similar one in the case of a small sample size (Ma, Wahab, Liu & Liu, 2018). ARDL model can be applied independently of the series' integration order since it does not set restrictions under the variables of interest (Pesaran & Pesaran, 1997). The formal ARDL model structure used in this study is as below:

$$\Delta Export_t = const + \delta_{Export} Export_{t-1} + \delta_{Deposit\ Interest\ Rate} Deposit\ Interest\ Rate_t +$$
$$\delta_{Inflation\ Rate} Inflation\ Rate_t + \delta_{Import} Import_{t-1} + \delta_{Exchange\ Rate} Exchange\ Rate_t +$$
$$\sum_{i=1}^{p} \alpha_{Export,i} \Delta Export_{t-i} + \sum_{i=1}^{p} \alpha_{Deposit\ Interest\ Rate,i} \Delta Deposit\ Interest\ Rate_{t-i} +$$
$$\sum_{i=1}^{p} \alpha_{Inflation\ Rate,i} \Delta Inflation\ Rate_{t-i} + \sum_{i=1}^{p} \alpha_{Import,i} \Delta Import_{t-i} +$$
$$\sum_{i=1}^{p} \alpha_{Exchange\ Rate,i} \Delta Exchange\ Rate_{t-i} + \theta ECT_{t-i} + \varepsilon_t,$$

where, δ_{Export}, $\delta_{Deposit\ Interest\ Rate}$, $\delta_{Inflation\ Rate}$, δ_{Import}, $\delta_{Exchange\ Rate}$ are the long-run coefficients; α_{Export}, $\alpha_{Deposit\ Interest\ Rate}$, $\alpha_{Inflation\ Rate}$, α_{Import}, $\alpha_{Exchange\ Rate}$ are the short-run coefficients, ECT is the error correction term, ε_t is the error term.

Critical values like Akaike, Schwarz, and Hannan-Quinn are used to determine the number of lags. The lag length providing the smallest critical value is determined as the lag length. If the model creates an auto-correlation problem, the second lag length that provides the smallest critical value is taken. If the autocorrelation problem still continues, this process is continued until this problem disappears (Karagol et al., 2007). In this study, the number of lags was determined as 4 according to the Akaike criterion. As a result of the LM test, an autocorrelation

problem was found in the model. To eliminate this problem, the appropriate lag length is taken as 3.

5. RESULTS AND DISCUSSIONS

The first technique to assess the long-run relationships between our series is cointegration – Bound test (Pesaran, Shin & Smith, 2001).

Using both statistics (Fisher statistic and T-Student statistic), we found that there is a long-term relationship between the series and therefore a cointegration between them. Since the cointegration relationship has been determined, ARDL model can be installed to determine the long and short run relationships. Table 3 presents the bounds test results.

Table 3. Bounds Test Results

Statistics	Critical values*		Conclusion
	Lower bound I(0)	Upper bound I(1)	
F-Statistics 5.887073	3.354	4.774	Cointegration
t-Statistics -4.051324	-2.86	-3.99	Cointegration

Note:*at 5% significance.

Source: Author's calculations.

The long-term coefficients calculated according to the estimation results of the ARDL (2, 3, 3, 3, 0) model are given in Table 4. According to the results, the coefficient of exchange rate (LEXC) has a positive and significant effect on exports at 1 percent level of significance. The inflation rate (LINF), at levels of 1 percent and 5 percent in the long run, has a negative impact on exports, indicating that it is insignificant, but shows significance at 10 percent. The coefficient of import rate (LIMP) depicts a negative and insignificant relationship with the exports in the long run. Lastly, the coefficient of deposit rate (LDEPO) has a positive but insignificant impact on exports at 1 per cent and 5 percent but shows significance at 10 percent.

Table 4 presents the result of the short-run dynamic in the model that shows the effect of inflation, exchange rate and import rate in promoting exports. Significant correlations were found between the short-term export rate and all other variables, in contrast to long-term coefficients. The direction of the relationship between exports and exchange rates is positive, with a coefficient

of 0.85. This coefficient can be interpreted to mean that 1 percent change in the exchange rate will increase exports as the percentage of GDP by 0.85 percent. This coefficient can be interpreted as 1 percent change in the exchange rate which will increase exports by 0.85 percent. Similarly, the direction of the relationship between exports and import is positive in the short run. In other words, 1 percent increase in imports as a percentage of GDP will increase exports by 1.21 percent. Additionally, the short run and long run directions of the connection between inflation and exports are both negative. One percent increase in inflation causes a decrease in exports of 0.25 percent. As expected, the error correction term (ECM-1) is negative and statistically significant. This means that deviations from the short run equilibrium will approach the long run equilibrium. The estimated value of this coefficient is -0.715. It shows that the speed of adjustment is high.

Table 4. ARDL (2, 3, 3, 3, 0) Model Results

Long-Run Coefficients				
Variables	Coefficient	Standard Dev.	t-Statistics	Prob.
LINF	-0.391990***	0.209811	-1.868302	0.0863
LIMP	-1.450767	0.947031	-1.531912	0.1515
LEXC	0.166923*	0.036149	4.617614	0.0006
LDEPO	0.296615***	0.154715	1.917162	0.0793
Short-Run Coefficients				
LEXP (-1)	0.825741*	0.156100	5.289805	0.0002
LINF	-0.253715*	0.055989	-4.531541	0.0007
LINF (-1)	0.106582**	0.038990	2.733567	0.0181
LINF (-2)	0.123354*	0.036778	3.354005	0.0057
LIMP	1.210113*	0.292337	4.139452	0.0014
LIMP (-1)	0.259459	0.245878	1.055233	0.3121
LIMP (-2)	0.742717**	0.253364	2.931421	0.0126
LEXC	0.850751*	0.085148	9.991453	0.0000
LEXC (-1)	-0.546191*	0.107961	-5.059169	0.0003
LEXC (-2)	0.178991***	0.089932	1.990291	0.0698
ECT (-1)	-0.715097*	0.114146	-6.264755	0.0000
	Number of obs.	R-squared	Adjusted R-squared	Log Likelihood
	31	0.927763	0.878101	54.08185

Source: Author's representation using E-Views 10

Note: *, **, *** 1 percent, 5 percent, and 10 percent denote significance at one percent, five percent, and ten percent levels.

A serial Breusch-Godfrey correlation LM test was used to determine whether there is autocorrelation among the residuals. Since the probability value is higher than 1 percent, we cannot reject the null hypothesis of no presence of autocorrelation. That means there is no autocorrelation problem in our model. In order to test for heteroskedasticity, the Breusch-Pagan-Godfrey test was performed. We observed that there is no heteroskedasticity in our model. The Jarque-Bera test was utilized to evaluate the normality distribution of the residuals. Normality was established at 1% and 5%. Similarly, the result displays the Ramsey Reset test for misspecification, which confirms that the model is accurately specified. All the test results are shown in Table 5.

Table 5. Diagnostic Test Results

Diagnostic Test Techniques	Statistics	Probabilities
Serial correlation (LM Test)	8.710378	0.0128
Heteroskedasticity (Breusch-Pagan-Godfrey Test)	18.64589	0.2302
Normality Test (Jarque-Bera)	3.656685	0.160680
Ramsey Reset Test	2.003494	0.1846

Source: Author's representation using E-Views 10

At last, to check for the stability of the model, the CUSUM squared test is used. As shown in Figure 1, our model deviates from the long-run equilibrium on and off to return inside the range. That means that the model is stable; it converges all the time to the long-run equilibrium.

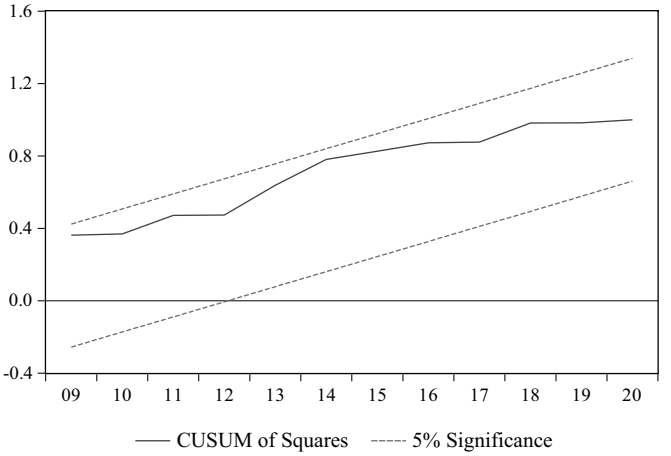

Figure 1. CUSUM of squares test results

Source: Author's representation using E-Views 10

6. CONCLUSIONS

The study is trying to determine the effect of the Turkish Lira's depreciation on exports in an empirical way using time series data from 1990 to 2020. The exchange, inflation, import and deposit interest rates were selected as independent variables to depict currency depreciation. ARDL bounds testing technique was employed for cointegration in the study.

The outcomes of the econometric analysis have shown that the exchange rate coefficient has a positive and significant impact on Turkey's exports in the long and short run. Changes in exchange rates are an essential determinant of Turkey's exports. Notably, parallel to the rapid increase in exchange rates since 2013, Turkey's share in world exports rose from 0.83 percent in 2013 to 1.02 percent in 2021. The balance between the exchange rate and export has always favored Turkey as an exporter. This result is in line with the study conducted by Sünbül (2011) that the exchange rate positively influences exports in Turkey.

The inflation rate has a negative and insignificant effect on exports in the long term, while its effects are negative and significant in the short term. In Turkey, the effect of inflation on exports happens in the form of eliminating the competitive exchange rate advantage provided by the rising exchange rate due to increased production costs, such as energy, raw materials, labor wages, etc.

Import rate shows a negative and insignificant impact in the long run, while it has a positive and significant effect on exports in the short run. Because Turkey's final goods output is typically reliant on imports, a boost in the exchange rate often floats trade openness in favor of imports. Importing raw materials and intermediate goods may boost Turkey's exports in the short run. But, when the exchange rate rises, imports will erode exports in the long run. Furthermore, since an increase in the exchange rate will increase the price of imported products in the market, inflation will also tend to increase.

The deposit interest rate has a positive but insignificant (at 1 percent and 5 percent level of significance) long-term impact on exports. This result differs from economic expectations because increasing interest rates may cause foreign trade activities and investments to decrease. Uslu (2018) found that the effect of an increase in the interest rate on exports is statistically insignificant. That is in line with the findings from the author for Turkey.

The target to be determined in terms of Turkey's exports should be to sell high-value-added, technology-intensive products to final consumers in dynamic markets with high purchasing power. In this respect, Turkey continues investing

in the electric automobile and defense industry and tries to produce new products in these sectors.

Exchange rate increases do not have an effect on exports alone. For this reason, exporters need a stable exchange rate and business environment, not ever-increasing exchange rates. In this context, we believe that import restrictions due to high exchange rates may hamper Turkey's export activities.

Conflict of interests

The author declares there is no conflict of interest.

REFERENCES

Adeyemi, O. J., & Oseni, I. O. (2021). Relationship among currency depreciation, money demand and trade balance in Nigeria: an autoregressive distributed lag approach. *Hallmark University Journal of Management and Social Sciences*, *3*(1), 43-56. https://www.academia.edu/45131407/Relationship_among_Currency_Depreciation_Money_Demand_and_Trade_Balance_in_Nigeria_An_Autoregressive_Distributed_Lag_Approach

Alemu, A. M., & Lee, J. (2014). Examining the effects of currency depreciation on trade balance in selected Asian Economies. *International Journal of Global Business*, *7*(1), 59-76. https://silo.tips/download/examining-the-effects-of-currency-depreciation-on-trade-balance-in-selected-asia

Barak, D., & Naimoğlu, M. (2018). Reel döviz kurunun dış ticaret üzerindeki etkisi: kırılgan beşli örneği. *Ömer Halisdemir Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, *11*(2), 82-95. https://doi.org/10.25287/ohuiibf.396831

Barışık, S., & Demircioğlu, E. (2006). Türkiye'de döviz kuru rejimi, konvertibilete, ihracat-ithalat ilişkisi (1980-2001). *Zonguldak Karaelmas Üniversitesi Sosyal Bilimler Dergisi*, *2*(3), 71-84. https://www.acarindex.com/dosyalar/makale/acarindex-1423937278.pdf

Barseghyan, G., & Hambardzumyan, H. (2017). The effects of exchange rate volatility on exports: evidence from Armenia. *Applied Economic Letters*, *25*(18), 1266-1268. https://doi.org/10.1080/13504851.2017.1418064

Bhatia, S. (2022). Currency depreciation and its benefits. *International Journal of Social Science and Economic Research*, *7*(10), 3302-3313.

Brun, M., Gambetta, J. P., & Varela, G. J. (2022). Why do exports react less to real exchange rate depreciations than to appreciations? Evidence from Pakistan. *Journal of Asian Economics*, *81*(C), 101496. https://doi.org/10.1016/j.asieco.2022.101496

Collier, P., & Gunning, J. W. (1992). Aid and exchange rate adjustment in African trade liberalization. *The Economic Journal*, *102*, 925-939. https://doi.org/10.2307/2234588

Çatalbaş, N. (2021). The relationship among import, export, and real exchange rate in Turkey. *Journal of Current Researches on Business and Economics, 11*(1), 49-72. https://doi.org/10.26579/jocrebe.91

Dilanchiev, A., & Taktakishvili, T. (2021). Currency depreciation nexus country's export: evidence from Georgia. *Universal Journal of Accounting and Finance*, *9*(5), 1116-1124. https://doi.org/10.13189/ujaf.2021.090521

Dinçer, N. N., Shingal, A., & Tekin-Koru, A. (2022). Exchange rate fluctuations, volatility and exports: the intensive margin effect for Turkish firms. *The Journal of International Trade and Economic Development*, *31*(3), 450-473. https://doi.org/10.1080/09638199.2021.1984548

Genemo, K.B. (2017). Effect of exchange rate on trade balance in major east African countries: Evidence from panel cointegration. *European Business & Management*, *3*(6), 95-104. https://doi.org/10.11648/j.ebm.20170306.11

Gül, E., & Ekinci, A. (2006). Türkiye'de reel döviz kuru ile ihracat ve ithalat arasındaki nedensellik ilişkisi: 1990 – 2006. *Dumlupnar Üniversitesi Sosyal Bilimler Dergisi*, *16*, 165-190.

IMF (2001). *Global Trade Liberalization and the Developing Countries*. November 2001. https://www.imf.org/external/np/exr/ib/2001/110801.htm

Karagol, E., Erbaykal, E., & Ertugrul, H. M. (2007). Economic growth and electricity consumption in Turkey: a bound test approach. *Munich Personal Repec Archive* (MPRA), No. 100150. https://mpra.ub.uni-muenchen.de/100150/1/MPRA_paper_100150.pdf

Kopuk, E., & Meçik, O. (2022). The effect of the depreciation of Turkısh Lira on Turkey's foreign trade. *Suleyman Demirel University Visionary Journal*, *13*(34), 551-565. https://doi.org/10.21076/vizyoner.990721

Krueger, A. O. (1983). The factor proportions explanation of trade, distortions, and employment. In *Trade and Employment in Developing Countries*. National Bureau of Economic Research (pp. 55-85). University of Chicago Press, Chicago.

Krugman, P. (2016). *The Return of Elasticity Pessimism.* Retrieved from: http://krugman.blogs.nytimes.com/2016/04/16/the-return-of-elasticity-pessimism-wonkish/?_r=1

Kumar, M., Begam, A., & Nargis (2020). The impact of currency depreciation on exports of SAARC countries. *Asian Journal of Economic Modelling*, *8*(1), 16-29. https://doi.org/10.18488/journal.8.2020.81.16.29

Lerner, A. P. (1944). *Economics of control: Principles of welfare economics*. Macmillan and Company Limited, New York.

Ma, F., Wahab, M. M., Liu J., & Liu, L. (2018). Is economic policy uncertainty important to forecast the realized volatility of crude oil futures? Is economic policy uncertainty important to forecast the realized volatility of crude oil futures? *Applied Economics*, *50*(18), 2087-2101. https://doi.org/10.1080/00036846.2017.1388909.

Oluitan, R. O., Anifowose, A. D., & Arokoyo, O. I. (2021). Impact of currency fluctuations on export revenue: case of some selected African countries. *Uniport Journal of Business, Accounting and Finance Management*, *12*(1), 1-17. https://www.

researchgate.net/publication/351225963_impact_of_currency_fluctuations_on_export_revenue_case_of_some_selected_african_countries

Ordu, C.F. (2013). *Relationship between exchange rates and foreign trade: case of Turkey*. [Master Thesis, Aydın Adnan Menderes University].

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. https://doi.org/10.1002/jae.616

Pesaran, M., & Pesaran, B. (1997). The role of economic theory in modelling the long run. *Economic Journal*, *107*(440), 178-91. https://doi.org/10.1111/1468-0297.00151

Said, S. E., & Dickey, D. A. (1984). Testing for unit roots in autoregressive-moving average models of unknown order. Biometrika, *71*(3), 599–607. https://doi.org/10.1093/biomet/71.3.599

Sünbül, E. (2021). Dış ticaret hacmi ve döviz kuru ilişkisinin ARDL sınır testi ile analizi (Türkiye Örneği). *Bankacılık ve Finansal Araştırmalar Dergisi*, *8*(1), 1-16. https://dergipark.org.tr/tr/pub/jobaf/issue/59603/802918

Upadhyaya, K. P., & Dhakal, D. (1997). Devaluation and the trade balance: estimating the long run effect. *Applied Economics Letters, 4*(6), 343-345. https://doi.org/10.1080/135048597355276

Uslu, H. (2018). Türkiye'de döviz kuru ve faiz oranının dış ticaret üzerine etkileri: yapısal kırılmalı bir analiz. *Ekonomi Politika ve Finans Araştırmaları Dergisi*, *3*(3), 311-334. https://doi.org/10.30784/epfad.453358

Utkulu, U., & Seymen, D. (2004). Trade and competitiveness between Turkey and the EU: Time series evidence. *Turkish Economic Association*, Discussion Paper, No. 2004/8. Turkish Economic Association, Ankara. https://www.econstor.eu/bitstream/10419/83227/1/dp_2004-08.pdf

Williamson, J. (1983). *The open economy and the world economy*. Basic Books, New York.

УТИЦАЈ ДЕПРЕЦИЈАЦИЈЕ ВАЛУТЕ НА ИЗВОЗ: ПРИСТУП АУТОРЕГРЕСИВНОГ ДИСТРИБУИРАНОГ ЗАОСТАЈАЊА ЗА ТУРСКУ ЛИРУ

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САЖЕТАК

Турска је доживјела многе економске кризе током посљедњих деценија 20. вијека и почетком 21. вијека, а међународне трговинске активности су се драстично промијениле пошто је турска валута „лира" озбиљно осцилирала. Турска лира је посљедњих година брзо депресирала у односу

на стране валуте, што је утицало на међународне трговинске активности Турске. Истраживање користи тестирање граница ауторегресивног дистрибуираног заостајања (АРДЛ) да би се истражио ефекат депресијације турске лире на турски извоз од 1990. до 2020. године. Налази сугеришу да је девизни курс повезан са извозом и на кратак и на дуги рок. Насупрот томе, стопа инфлације има негативан и безначајан дугорочни утицај на извоз, али негативан и значајан краткорочни ефекат. Даље, увоз има негативан и безначајан утицај на дужи рок, док извоз има позитиван и значајан ефекат на кратак рок. На дуги рок, пасивна каматна стопа је позитивна, али безначајна на нивоу значајности од 1 и 5 процената. Ови резултати сугеришу да би Турска требало да производи интермедијарну робу у очекивању високог девизног курса и да извози производе са високом додатном вриједношћу који захтијевају интензивну технологију како би се елиминисала зависност турског извоза од увоза.

Кључне ријечи: *депресијација валуте, курс, извоз, увоз, АРДЛ*