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DÖVİZ KURU DALGALANMALARI VE ÖDEMELER DENGESİ: TÜRKİYE'DEN KANITLAR[1]

EXCHANGE RATE FLUCTUATIONS AND THE BALANCE OF PAYMENTS: EVIDENCE FROM TÜRKiYE

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Öz

Bu çalışma, döviz kurundaki değişimler ile Türkiye'nin ödemeler dengesi (ÖD) arasındaki ilişkiyi incelemektedir. Çalışmada, 2000:Q1 ile 2019:Q4 dönemleri arasındaki çeyreklik veriler kullanılarak, değişkenler arasındaki uzun ve kısa dönem ilişkileri tahmin etmek için ARDL yaklaşımı kullanılmıştır. Bu çalışmada, her bir serinin I(2) olup olmadığından emin olmak için, birim kök testi olarak Augmented Dickey-Fuller ve Phillips-Perron testlerine başvurulmuştur. Veriler Türkiye Cumhuriyet Merkez Bankası (TCMB) ve TÜİK veri tabanlarından elde edilmiştir. Çalışmada, değişkenler arasında uzun dönemli bir ilişkinin varlığını kontrol etmek için sınır eşbütünleşme testi yaklaşımı kullanılmıştır. Bulgular, döviz kuru ve dışa açıklığın uzun dönemde anlamsız olduğunu, TÜFE, reel GSYİH ve faiz oranının ise istatistiksel olarak anlamlı olduğunu göstermektedir. Ancak kısa dönemde döviz kuru, TÜFE ve reel GSYH'ın BOP'u etkileyen önemli faktörler olduğu bulunmuştur.

Anahtar Kelimeler: Döviz Kuru Değişimi, Ödemeler Dengesi, ARDL, Birim Kök, Eş Bütünleşme, TCMB, Sınır Testi, ADF, Phillips Perron Testi

JEL Sınıflaması: F31, F32, F41

Abstract

This study examines the relationship between exchange rate changes and the BOP of Türkiye. While utilizing quarterly data ranging from 2000:Q1 to 2019:Q4, the study employs ARDL approach to estimate the long run and the short run relationship between the mentioned variables. To make sure that none of the series are I(2), the study uses Augmented Dickey Fuller and Phillips Perron tests for unit root testing of the series. Data are taken from the Central Bank of the Republic of Türkiye (CBRT[2]) and TURKSTAT[3] databases. The study used bound cointegration testing approach to check for the existence of the long run relationship between the variables. The findings indicate that exchange rate and openness are insignificant in the long run, while CPI, real GDP, and IR were found to be statistically significant. Whereas the exchange rate, CPI, and real GDP are the factors significantly influencing the BOP in the short run.

Keywords: Exchange Rate, Fluctuations, The Balance of Payment, ARDL, Unit Root, Cointegration, CBRT, Bound Test, ADF, Phillips Perron Test

JEL Classifications: F31, F32, F41

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[2] CBRT (Central Bank of the Republic of Türkiye): https://evds2.tcmb.gov.tr/index.php?/evds/serieMarket
[3] TURKSTAT (TUIK): https://www.tuik.gov.tr/Home/Index

1. Introduction

Exchange rate is the price of one currency in terms of another currency. It is considered as a key policy instrument affecting the major macroeconomic variables such as price levels, real income and wealth. It is usually used by the policy makers to stabilize and improve the balance of payments through global competitiveness. In order to create cross-border trade among the countries, the currency of a country should be valued in terms of another currency which signifies the existence of the relationship between the exchange rate and the balance of payments. That's why nations try to have an effective exchange rate policy so that to achieve stabilization in other macroeconomic variables, particularly in inflation and in the BOP. During the last two decades Turkish Lira has witnessed a continued depreciation, which undoubtfully may have its effects on trade and on its BOP. It is usually considered that devaluation or depreciation improves external competitiveness and the BOP of a nation. In such a scenario, policy makers face a trade-off between improvements in external competitiveness and increasing price level domestically.

Empirically, there is no consensus among the researchers for the effects of exchange rate on the balance of payments. Some studies have shown positive and statistically significant effects of currency depreciation on the BOP (Iyoboyi and Muftau, 2014; Odili, 2014; Ahmad, Khoso *et al*., 2014); some found negative effects of depreciation (Nwanekezie and Onyiro, 2018; Salasevicius and Vaicious, 2003) and some others found its no effects. (Afolabi and Sherif, 2017; Alawattage, 2009; Gebremariam, Batu, and Tola, 2018) Keeping in mind this scenario, one cannot find unanimous results for the effects of exchange rate changes on the balance of payments. That's why the main objective of this paper is to examine the relationship of recent depreciation in Turkish Lira on the balance of payments of Turkish economy. Till date, up to the best of our knowledge, none of the studies have examined such a relationship. The study uses quarterly data from 2000:Q1 to 2019:Q4 while employing ARDL and error correction model (ECM) for estimation. The results indicate that exchange rate and openness are insignificant in the long run, while CPI, real GDP, and IR were found to be statistically significant. Whereas the exchange rate, CPI, and real GDP are the factors significantly influencing the BOP in the short run.

The rest of the paper is structured as follows. The next section presents literature review consisting of theoretical and empirical review. The subsequent section explains the methodology and data sources. The following section provides the results and discussions of the estimation. Lastly, the study winds up with some recommendations, policy implications and some concluding remarks.

2. Literature Review

2.1. Theoretical Review

As far as the theoretical background is concerned, the study presents the elasticity approach of the traditional theory. Exchange rate is considered as a key instrument in this approach. This approach relates demand for foreign exchange with demand for foreign goods and services which has a direct effect on the current account of the balance of payments. In this approach it is stated that as a result of the devaluation or depreciation of a currency, the prices of imports increase and of exports decrease. This in turn improves the current account balance and helps lower its deficit. But the extent to which this approach will really have its positive effects depends on the Marshall Lerner (ML) condition. Marshall Lerner condition states that for the exchange rate to have its positive effects on the balance of payments, the sum of the elasticities of demand for imports domestically and for exports abroad should be greater than unity in absolute terms. (Marshall, 1923; Lerner, 1944) However, if the sum of the foreign elasticity for exports and home country elasticity of imports is less than one, devaluation will result in worsening of the balance of payments (Pilbeam, 1998).

On the other hand, in monetary approach to the balance of payments, BOP is considered as a monetary flow which is solely explained by the disequilibrium in the money market. It suggests that improvements in trade is meant as improvements in the BOP due to inflow of the international money. (Whitman,1975; Frenkel and Johnson,1976) In addition, it also states that economic variables influence the exchange rate through the channel of supply of and demand for money, which implies that demand for and supply of money balances are considered as the key factors influencing the external position of a country. More precisely, an increase in demand for a country's money would strongly improve the balance of payment, while an increase in supply of money will lead to an increase in the deficit of the BOP (Levacic and Rebmann, 1982).

2.2. Empirical Review

The empirical literature contains numerous studies that have examined the linkages between exchange rate changes and the balance of payments. However, there does not exist consensus among the findings of the previous studies

and are not in-line with each other. For example, for depreciation of the exchange rate, some show expansionary BOP effects while some others show contractionary BOP effects. In this section, the study will have a brief look at the literature focused on the association between exchange rate changes and the BOP.

Iyoboyi and Muftau (2014) empirically examined the effects of depreciation on the balance of payments for Nigeria, employing multivariate error correction framework. The study finds negative relationship between exchange rate and the balance of payments, indicating that depreciation of Nigerian Naira improves the balance of payment through increment in net exports. In addition, Odili (2014) investigated the impact of exchange rate on the balance of payments, both in the long run and in the short run for Nigeria. The study comes up with a positive and statistically significant relationship in the long run, but with a statistically insignificant relationship in the short run. Moreover, Ahmad, Khoso *et al*. (2014) found positive and significant relationships between exchange rate and the balance of payment for Pakistan, employing ARDL estimation method and Granger Causality tests. Their results are in line with Iyoboyi and Muftau (2014), and Olanipekun and Ogunsola (2017) for the case of Nigeria. Kandil (2004) found the same results for developing countries.

Contrary to the above, Nwanekezie and Onyiro (2018) investigated the effects of exchange rate volatility on the balance of payments of Nigeria using error correction model. Their results reveal that changes in the nominal exchange rate adversely affect the balance of payment. In addition, while employing VECM, Salasevicius and Vaicious (2003), investigated the association of exchange rate and trade in Baltic States and tested for the Marshall-Lerner (ML) condition. Their findings state that Lithuania met the ML condition, but Estonia did not, though, the results were ambiguous for Latria.

On the other hand, Afolabi and Sherif (2017) found no significant long run relationship between exchange rate and the balance of payments of Nigerian economy. Similarly, Alawattage (2009) found no significant effects of exchange rate fluctuations on the balance of payments for Sri Lanka. Gebremariam, Batu, and Tola (2018) examined the effects of real effective exchange rate on balance of payment of Ethiopia employing cointegrated vector auto regressive and impulse response function approach. Their findings signify that depreciation and devaluation of real effective exchange rate first deteriorates the current account and improves it later, that is exhibiting the J-curve pattern.

For the case of Turkiye, few studies exist that have examined the association of the exchange rate and balance of payments. For instance, Erkiliç, Telatar, and Müdürlüğü (2006) empirically examined the determinants and dynamics of the current account deficit in Türkiye and came up with strong evidence showing that lagged current account deficit, economic growth rate and exchange rate are statistically most significant determining factors of current account deficit in Türkiye. Likewise, Peker and Hotunluoğlu (2009) evidenced the same results to the former, in which they indicate that real exchange rate, real interest rate and IMKB are the most important variables, having key role in determining the current account deficit in Türkiye. In addition, Tashtanbekova (2011) in her master's degree thesis determined a causal relationship between balance of payments and exchange rates for developing countries and the Türkiye. In a similar line, while exploring the relations between the current account deficit and the real exchange rate and economic growth for Türkiye, similar results to Peker & Hotunluoğlu (2009) were found by Çiftçi (2014) in which he points out that the current account deficit is the Granger cause of the changes in GDP and real exchange rates. Further, Vergil and Erdoğan (2009) examined the validity of the J-curve effect in the short term and whether the Marshall-Lerner condition is satisfied or not, by using quarterly data in the 1989-2005 period in Türkiye. Their results figure out that the Marshall-Lerner condition was satisfied, and the J curve effect was valid for Türkiye. Moreover, Akduğan & Doğan (2018) investigated the linkages of real exchange rate changes and the balance of payments in Turkiye using monthly data for the period 1996-2015 and point out that real exchange rate-based policies in Turkey can strengthen the foreign trade balance and thus the current account balance.

Having a look at the literature discussed so far, the relationship between exchange rate changes and balance of payments is inconclusive and a consistency in the findings has not been seen. Though there are few studies for the case of Türkiye, they have used different methods and most of them focused on prior time periods. To the best of our knowledge, none of the studies have focused on the recent period in which Turkish Lira have witnessed a considerable depreciation. To this end, this study tries to fill this gap by estimating the impact of exchange rate changes on the balance of payments of Turkey using ARDL approach covering the period 2000-2019.

3. Methodology and Data

This study carries out the analysis using ARDL and bound cointegration test approach. This approach does not require that all regressors should be I(1), as ARDL could be estimated even if the regressors are a mixture of the

I(0) and I(1) which is considered as the advantage of the ARDL over other approaches. However, it requires that none of the series should be I(2). To this end, the analysis starts with unit root test of the series using Augmented Dickey Fuller test (Dickey and Fuller, 1979). Subsequently, the study tests for cointegration among the variables of interest using bound testing approach. In case, if the cointegration detects, the study would then apply the Error Correction Model (ECM) of ARDL approach to find the long run and short run dynamics of the underlying variables.

It is of worth mentioning that the study uses Akaike Information Criteria (AIC) for the selection of the lag length. For the post-estimation diagnostic tests, this study tests for heteroskedasticity, autocorrelation, and multicollinearity. To test whether the estimated coefficients are reliable and stable, cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) are used to make it sure that the line is inside the 95% confidence boundaries.

3.1. Model Specification

To examine the effects of the exchange rate fluctuations on the balance of payments, the study employs the following econometric specification.

$$BOP = f(REER, Interest\ Rate, Real\ GDP, CPI, Openness)$$

The Autoregressive Distributive Lag (ARDL) model of the study could be written as following.

$$\Delta lnBOP_t = \alpha_0 + \alpha_1 lnBOP_{t-i} + \alpha_2 REER_{t-i} + \alpha_3 lnRGDP_{t-i} + \alpha_4 CPI_{t-i} + \alpha_5 IR_{t-i} + \alpha_6 Openness_{t-i} + \sum_{i=1}^{p} \sigma_i \Delta lnBOP_{t-i} + \sum_{j=0}^{q} \beta_j \Delta REER_{t-j} + \sum_{k=0}^{q} \gamma_k \Delta lnRGDP_{t-k} + \sum_{m=0}^{q} \delta_m \Delta CPI_{t-m} + \sum_{n=0}^{q} \theta_n \Delta IR_{t-n} + \sum_{h=0}^{q} \varphi_h \Delta Openness_{t-h} + \varepsilon_t \quad \dots\dots\dots (1)$$

Where lnBOP is the natural log of the Balance of Payments; REER is real effective exchange rate; lnRGDP is natural log of real gross domestic products; CPI is the consumer price index, and IR is interest rate. Alongside, α_0, Δ, $and\ \varepsilon_t$ designate the constant term, first difference of the variables, and white noise error term, respectively. Likewise, α_i represent the long run coefficients of the model, whereas, $\sigma,\ \beta,\ \gamma,\ \delta,\ \theta, and\ \varphi$ denotes the short run coefficients of the model.

The long run relationships are estimated by following model.

$$lnBOP_t = \alpha_0 + \alpha_1 lnBOP_{t-i} + \alpha_2 REER_{t-i} + \alpha_3 lnRGDP_{t-i} + \alpha_4 CPI_{t-i} + \alpha_5 IR_{t-i} + \alpha_6 Openness_{t-i} + u_t \quad \dots\dots\dots (2)$$

If the study detects cointegration, it will then estimate the following error correction model (ECM).

$$\Delta lnBOP_t = \sum_{i=1}^{p} \sigma_i \Delta lnBOP_{t-i} + \sum_{j=0}^{q} \beta_j \Delta REER_{t-j} + \sum_{k=0}^{q} \gamma_k \Delta lnRGDP_{t-k} + \sum_{m=0}^{q} \delta_m \Delta CPI_{t-m} + \sum_{n=0}^{q} \theta_n \Delta IR_{t-n} + \sum_{h=0}^{q} \varphi_h \Delta Openness_{t-h} + \mu(ECT)_{t-1} + v_t \quad \dots\dots\dots (3)$$

Equation 3 includes an extra term, named ECT. Its coefficient (μ) signifies the speed of adjustment at which the model returns to its long run equilibrium path, after a shock happened in the short run.

3.2. Data

This study relies on two key sources for its data, namely the databases of the Central Bank of the Republic of Turkey (CBRT) and TURKSTAT. To ensure comprehensive and accurate analysis, various economic indicators and variables have been extracted from these sources. Specifically, data on exports, imports, and Real Gross Domestic Products (GDP) have been sourced from TURKSTAT. These variables play a crucial role in capturing the dynamics of international trade and the overall economic performance of Turkey. Additionally, the databases of the Central Bank of the Republic of Turkey (CBRT) have been extensively utilized to gather data on the Balance of Payments (BOP), Consumer Price Index (CPI), and Real Effective Exchange Rate (REER). The BOP data provides insights into the country's economic transactions with the rest of the world, including exports, imports,

and capital flows. The CPI data, on the other hand, serves as a measure of inflation, providing valuable information on changes in the overall price level of goods and services consumed by households. Lastly, the REER data offers an important gauge of the competitiveness of the Turkish economy, considering the influence of exchange rate fluctuations on trade and international competitiveness. By combining data from both the CBRT and TURKSTAT databases, this study ensures a comprehensive and robust analysis of the relationship between exchange rate fluctuations, the balance of payments, and various macroeconomic variables in Turkey. The reliance on these reputable sources of data enhances the reliability and validity of the findings, allowing for meaningful insights and evidence-based conclusions.

Table 1. Descriptive Statistics of the variables

Variable	**Obs.**	**Mean**	**Std. Dev.**	**Min**	**Max**
lnBOP	88	- 2.096	8.242	-9.962	9.812
REER	88	101.863	13.436	62	128
CPI	68	211.088	90.105	96	438
IR	88	24.988	28.489	1.5	183.2
lnRGDP	88	19.184	1.119	16.414	20.897
Openness	88	29.375	20.189	8.475	116.30

Source: Author

However, Interest Rate (IR) is taken from OECD databases. Openness is calculated by the author as the summation of exports and imports divided by real GDP.

4. Results and Discussions

As mentioned earlier, the study starts its analysis by testing unit roots of the series, using Augmented Dicky-Fuller (ADF) and Phillips-Perron (PP) tests. The results of the tests are given in Table 2.

Table 2. Augmented Dickey-Fuller (ADF) unit root test results

Variable	Level		First Difference	
	Without Trend	With Trend	Without Trend	With Trend
lnBOP	-6.082***	-6.034***	-	-
REER	-2.060	-2.382	-7.90 ***	-8.047 ***
CPI	4.708	2.599	-2.77*	-4.346 ***
IR	-2.592*	-3.381*	-9.40***	-9.401***
lnRGDP	-2.431	-3.287*	-13.74***	-15.155***
Openness	-7.406***	-7.484***	-	-

*, **and *** denote the rejection of the null hypothesis at 10%, 5% and 1% significance levels, respectively.

Source: Author

The results of the unit root test, presented in Table 2, indicate that lnBOP and Openness exhibit stationarity at the level, while all other variables display stationarity at the first difference. Consequently, none of the variables are classified as I(2). Similarly, the Phillips-Perron unit root test outcomes, as shown in Table 3, reveal that lnBOP, IR, and Openness exhibit stationarity at the level, whereas the remaining variables demonstrate stationarity at their first difference. Once again, it is evident that none of the variables belong to the I(2) category. With the confirmation that none of the variables possess I(2) characteristics, the subsequent step involves examining the

existence of long-run relationships among the variables. To accomplish this, the study employs the bound cointegration test.

Table 3. Phillips-Perron (PP) unit root test results

Variable	Level		First Difference	
	Without Trend	With Trend	Without Trend	With Trend
lnBOP	-66.40***	-66.60***	-110.07***	-110.19 ***
REER	-10.870	-12.165	-97.223***	-98.48***
CPI	2.529	4.539	-27.435 ***	-48.67***
IR	-17.231**	-34.32***	-114.887***	-115***
lnRGDP	-2.373	-11.758	-86.891***	-89.18***
Openness	-10.46***	-13.34***	-64.198***	-75.12***

*, **and *** denote the rejection of the null hypothesis at 10%, 5% and 1% significance levels, respectively.

Source: Author

Similarly, the Phillips-Perron unit root test results given in Table 3 shows that lnBOP, IR and Openness are stationary at level, while the remaining variables are stationary at their first difference. Still it is seen that none of the variables are I(2). After making sure that none of the variables are I(2), now it is time to check for long-run relationships among the variables. To this end, the study employs bound cointegration test.

Table 4. Bound test results for Cointegration.

10%		5%		2.5%		1%		F-Stat.
I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	15.432
2.45	3.52	2.86	4.01	3.25	4.49	3.74	5.06	

Source: Author

4.1. Testing for Cointegration

The ARDL bound test is used to see for the cointegration among the variables. The null hypothesis of the test is "There is no level relationship.", indicating that for the existence of the long run relationships, the null hypothesis should be rejected.

Table 4 shows that F-Statistics is greater than I(1) in all level of the significances, signifying that null hypothesis of "no level relationships." should be rejected. The rejection of null hypothesis means that there exists a long run relationship among the variables of interest.

Table 5. Results of the ARDL (2,3,2,2,3,0) long-run model selected based on AIC.

Regressors	Coef.	Std. Err.	t-Stat.	Prob.
REER	.0679	.163	0.41	0.680
CPI	-.0922	.054	-1.69	0.099
IR	0.511	.179	-0.151	0.006
lnRGDP	18.00	7.03	2.56	0.014
Openness	- .145	0.27	-0.54	0.594
Cons.	- 424.606	149.787	2.86	0.007

Source: Author

4.2. Long run and short run relationships

The estimated long run relationships are given in Table 5. In the long run, real GDP, interest rate, and CPI are found statistically significant, while Openness and REER are insignificant. While looking at the respective coefficients, a 1% increase in RGDP and interest rate raises BOP by 18%, and 0.511%, respectively.

However, a one index unit increase in CPI adversely affects the BOP by 0.0922%, on average. Overall, 70% of the variations in dependent variables are explained by explanatory variables. Based on the AIC, the selected optimal lag length is 4.

The short run dynamics of the model are given in Table 6. It shows that in the short run, holding all other things constant, the real effective exchange rate has a negative and statistically significant relationship with the balance of payment. More explicitly, a one index unit depreciation in REER raises the BOP by 0.525 percent, on average. Similarly, RGDP and CPI are significant at 10%. Whereas, IR has not been found significant in the short run. The coefficient of the ECM term is -1.228 which is negative and significant, signaling long run equilibrium relationship. If, due to any shock, there is a deviation from long run equilibrium path, 1.228 percent adjustment to the long run path will happen each period, shown by the coefficient of the ECM term in the model.

Table 6. Results of the ARDL (2,3,2,2,3,0) ECM model selected based on AIC

Regressors	Coef.	Std. Err.	t-Stat	Prob.
$\Delta lnBOP_{-1}$	0.203	0.112	1.81	0.077
$\Delta REER$	- 0.525	0.184	-2.86	0.006
$\Delta REER_{-1}$	- 0.331	0.187	-1.77	0.083
$\Delta lnRGDP$	- 19.18	10.753	-1.78	0.081
$\Delta lnRGDP_{-1}$	- 22.55	9.219	-2.45	0.018
ΔCPI	0.521	0.264	1.97	0.054
ΔCPI_{-1}	-0.932	0.268	-3.47	0.001
$\Delta Openness$	0.410	0.131	-1.02	0.314
$\Delta Openness_{-1}$	0.032	0.458	-1.24	0.737
$\Delta Openness_{-2}$	-0.153	0.443	-1.94	0.063
ECM_{-1}	-1.228	0.168	-7.29	0.000

R-Squared	0.786	Log likelihood	-190.313
Adj. R-Squared	0.707	DW-Statistics	(6, 67) 1.754
Root MSE	5.583	AIC	416.627
F-Statistics	F(5, 46) = 2.59**		

Source: Author

4.3. Post estimation diagnostic tests

To check for the stability and consistency of the estimated coefficients, the study uses some tests, such as heteroscedasticity, multicollinearity, autocorrelation etc. The results of these diagnostic tests are given in Table 7. Having a look at the results, the null hypothesis of "Constant Variance" could not be rejected, meaning that there is no heteroskedasticity. Similarly, the LM test result suggests that ARCH effects do not exist. Further, Durbin-Watson d-statistic proposes that there is no first-order serial correlation. The same result is supported by Durbin's alternative test for serial correlation. For higher-order serial correlation, Breusch-Godfrey test result further reinforces that there is no autocorrelation.

Table 7. Post Estimation Diagnostic Test Results

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity		LM test for autoregressive conditional heteroskedasticity (ARCH)	
$chi^2(1)$	Prob.	Chi^2	Prob.
1.81	0.1782	0.667	0.4139

Durbin's alternative test for autocorrelation			
Lags(p)	Chi2	Df	Prob.
1	0.741	1	0.3893

Breusch-Godfrey LM test for autocorrelation			Swald test for a structural break	
Lags(p)	Chi^2	Prob.	Statistics	p-value
1	0.818	0.3659	18.6757	0.0782

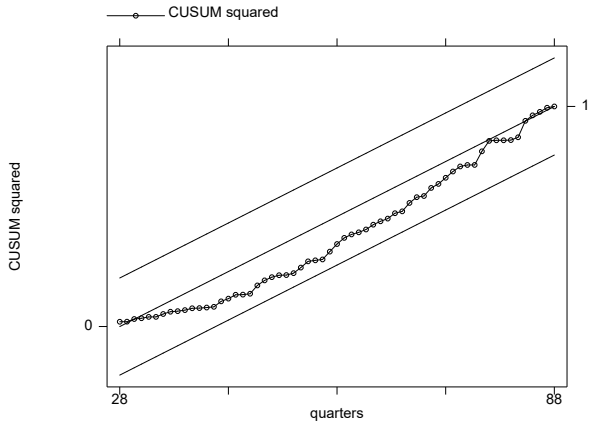
Ramsey RESET test Ho: model has no omitted variables		Durbin-Watson d-statistic
F(3, 58)	Prob.	d-statistic (6, 67)
0.63	0.5956	1.75285

Source: Author

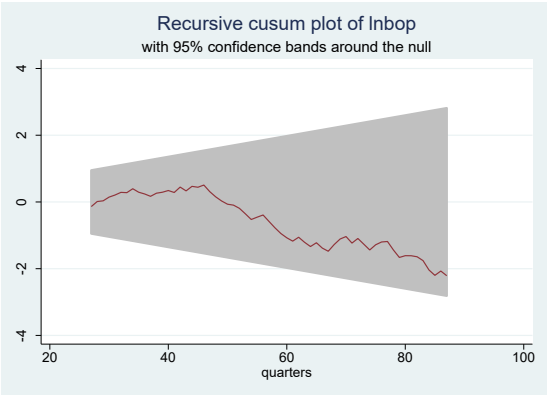
While using the Swald test for structural breaks, its result demonstrates that the null hypothesis of "No Structural Break" could not be rejected, inferring that there does not exist any structural break. The results Ramsey RESET test for omitted variables, concludes that the model does not have omitted variables.

Figure 2. CUSUMSQ and Recursive CUSUM plots for the lnbop

a. CUSUMSQ plot



b. Recursive CUSUM plot of lnBOP



Source: Author

It is to be noted that cointegration among the variables does not guarantee the stability of parameters. Thus, this study tests the stability of the estimated long-run coefficients by employing cumulative sum (CUSUM) and cumulative and CUSUM squares (CUSUMSQ) tests. Applying these stability tests to the residuals of the model amounts to testing for stability of the coefficients in the short-run as well as in the long-run which is reported as the graphical representation to the readers. Figure 2 reveals that the long-run and the short-run coefficients of the BOP model in the case of Türkiye are stable due to fact that the plots of the fitted model of both CUSUM and CUSUMSQ statistics lie between critical values at the 95% confidence interval.

5. Policy Recommendations and Implications

This study found that exchange rate changes are not a significant factor influencing the BOP in the long run, while it is found significant and negatively affecting factor in the short run. It implies as Turkish Lira depreciates, performance of BOP improves in the short run, while it does not affect the BOP in the long run. In the short run, as Lira depreciates, net exports increases which improves the current account and hence the BOP. Whereas, in the long run, huge payments for imports due to high import prices offset the advantage taken in the short run. Thus, for the improvement of the BOP in the short run, respective authorities of Turkish government may use exchange rate as a policy instrument. The implication of this policy recommendation is that the devaluation of the real effective exchange rate of Lira by one index unit, improves the BOP by 0.525 percent, on average. In addition, CPI and real GDP were found statistically significant, inferring that inflation and economic growth are other factors influencing the BOP in the short run. Consequently, besides the exchange rate, money supply could also be used as a policy instrument by central bank to regulate inflation and positively influence the BOP.

On the other hand, in the long run, CPI, interest rate and real GDP found significant, signaling again that inflation could be used to improve BOP. A one index unit decrease in CPI improves the BOP by 0.0922 percent, on average. It is also seen that an increase in interest rate by one percent enhances the amount of capital inflow, and hence improves the BOP by 0.511 percent, on average.

6. Conclusion

The main objective of this study is to see the effects of recent depreciation of Turkish Lira on the BOP of Türkiye. The study used ADF and Phillips-Perron unit root tests to check the order of integration of the series. It was found none of the series was I(2). For the long run relationships, the study employed ARDL bound testing technique, and found that there exists a long run relationship among the variables, particularly of the exchange rate and the BOP. To estimate the long run and the short run coefficients of the model, the study used ARDL error correction model. This study contributes to the linkages between exchange rate changes and the balance of payments for the case of Türkiye covering the recent period 2000-2019. More precisely, the findings show that in the long run, exchange rate and openness are insignificant, while CPI, real GDP, and IR were found to be statistically significant. However, in the short run, the results indicate that exchange rate, CPI, and real GDP are the factors significantly influencing the BOP. Our results are in-line with that of Erkiliç, Telatar, and Müdürlüğü (2006) and Peker and Hotunluoğlu (2009) for the case of Türkiye and with Afolabi and Sherif (2017) & Alawattage (2009) for the cases of Nigeria and Sri Lanka, respectively.

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