

Effects of Currency War on Turkish Economy

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Abstract: *Currency war is one of the most feared international economic developments not only for developed countries but also for developing countries. Because in the modern integrated world all of these countries are related through various channels specially through international trade. The aim of this paper is to study currency wars on the basis of related theoretical framework and to find the effect of currency wars on developing countries. To achieve this objective, the effect of dollar-euro parity on real effective exchange rate and real GDP of Turkish economy after the financial crises has been analyzed.*

Keywords: Currency Wars, VAR Model, Dollar-Euro Parity, Turkey

1. Introduction

Currency war is a situation where economically powerful countries try to acquire more profit than other by applying serial devaluation policies. These policies are called “Beggary neighbour” as it aims to acquire more profit but by harming neighbour. Currency war is one of the most feared international economic development not only for developed countries but also for developing countries. Because in the modern integrated world all of these countries are related through various channels specially through international trade. To show the effect of currency war on developing countries, in this paper Turkey is taken as a representative of developing countries.

Turkey is also a representative of small open economy. Therefore, through export and import Turkey is related to the rest of the world. So, it is reasonable to expect that exchange rate of Turkey is affected by the changes of foreign currencies. For measuring the effect of currency war on Turkey, at first we need to see the effect of major currency fluctuations on real effective exchange rate. As dollar-euro are the most used and powerful currency for Turkey and the rest of the world, dollar-euro parity will be regarded as the representative currencies of the war. So, in the first model, the effect of this parity on real effective exchange rate of Turkey will be measured.

However, foreign currencies may also affect developing countries like Turkey through channels like tourism, foreign direct investment and many more. These are considered as direct effects. Another matter of concern is spillover or indirect effects. It is not possible to measure and discuss all those effects separately in a single paper. So, for simplicity only overall effect is considered in this paper. For this purpose, in the second model, the effect of dollar-euro parity on GDP of Turkish economy is analyzed.

2. Literature Review

In the literature these topics did not get the attention it deserves. As a representative of developing country, the literature is much more limited for Turkey. Among these studies the most important one is Berument and Dinçer (2005). They at first specified that the import of Turkish

economy is mostly based on dollar and export is based on euro, therefore an increase in dollar-euro parity must improve the terms of trade and thus the overall economy. To test this, they used monthly data which covers the period of 1985:01 to 2003:07 and VAR(vector autoregression) model. They found that a positive shock to the dollar-euro parity cause an increase in trade balance and in the long run relative income to increase but real exchange rate to appreciate.

Similar results were found by Yücel (2005) which used the quarterly data instead of monthly data from 1987q1 to 2004q4. With the help of VAR setup and blocked exogeneity, Yücel (2005) also found that real exchange rate and inflation responds negatively and output responds positively to an innovation of parity.

Another similar study is Berument ve Yücel (2008). They have used three variable VAR which includes real exchange rate, inflation and real GDP. They have also used the data set of 1987q1 to 2004q4 and also found similar results.

Saatcioğlu ve Karaca (2010) have studied the impact of dollar-euro parity on export of Turkey with quarterly data from 2002 to 2010. For finding long-run relationship between the parity and export they have used ARDL (autoregressive distributed lag) model and ECM(error correction model) for short-run. They have concluded that the changes of the parity affect export of Turkey in both short and long-run.

3. Analysis Method: VAR Model

In this study, as econometric analysis method, VAR model is used. VAR model is often used for time series analysis. The speciality of this model is it's impulse response function. This model can also capture exogenous effect. However the reason behind selection of this method for this study is, with this method the effect of one way relationship can be captured. That means VAR model is the most suitable method for measuring blocked exogeneity.

Christopher A. Sims rose serious objections towards the then standard econometric models and presented VAR model as non-standard economic model which became popular

afterwords (Sims,1980). However in this study, VAR model described by James D. Hamilton will be used. The model can be presented as:

$$y_t = c + \beta_1 y_{t-1} + \beta_2 y_{t-2} + \dots + \beta_p y_{t-p} + \varepsilon_t \quad (1)$$

Here, equation (1) is a p th order VAR(p) where y_t is an $(n \times 1)$ vector which contains a set of random variables. For example, the first element of y_t which can be denoted as y_{1t} may represent real GDP and second element may represent dollar-euro parity for year t . Here c denotes an $(n \times 1)$ vector of constants and β_j an $(n \times n)$ matrix of autoregressive coefficient for $j=1,2,3,\dots,p$. The $(n \times n)$ vector ε_t is a vector generalization of white noise (Hamilton, 1994: 257-258).

3.1 Calculations of Real Effective Exchange Rate:

Real effective exchange rate(REER) shows the real value of a currency. For this reason, in this study real effective exchange rate is used instead of nominal exchange rate or real exchange rate. The data for real effective exchange rate is collected from TCMB. TCMB computed REER as weighted geometric average of Turkey's price relative to it's the major trade partner's price. The basic calculation can be shown as:

$$REER = \prod_{i=1}^N \left[\frac{P_{TUR}}{P_i * e_{i,TUR}} \right]^{w_i} \quad (2)$$

Here, N represents the number of countries and w_i is the weight given to country i in REER index of Turkey. P_i is the price index of country i , where as P_{TUR} is the price index of Turkey. $e_{i,TUR}$ is the nominal exchange rate of country i in terms of Turkish lira. A rise in REER means an increase in the value of Turkish lira (Kocakale and Toprak, 2015:6). Similarly a decrease means, decrease in the value of lira and a fall in the value of Turkish commodity in terms of foreign commodity.

4. Effect of Dolar-Euro Parity on Real Effective Exchange Rate (REER)

In this part, to measure the effect of dollar-euro parity on the real effective exchange rate of Turkey, a simple model is formed. Later on by using VAR method the model will be estimated.

4.1 Model 1 and Data Set

In the first model, real effective exchange (REER) is the dependent variable and dollar-euro parity (PARİTE) is the independent variable. Equation 5 represents the simple model.

$$REER_t = \beta_1 + \beta_2 PARİTE_{t-1} + \beta_3 PARİTE_{t-2} + \beta_4 PARİTE_{t-3} + \beta_5 PARİTE_{t-4} + \beta_6 PARİTE_{t-5} + \beta_7 PARİTE_{t-6} + \beta_8 PARİTE_{t-7} + \varepsilon_t \quad (3)$$

Here, β_1 represents the constant parameter, β_2 is the coefficient of parity and ε_t is the error term.

For the 1st model, monthly parity data of dollar/euro for 2010:01 to 2017:10 is collected from ECB and real effective exchange rate data for the same period is collected from TCMB which is CPI real effective exchange rate, and the base is 2003=100. To see the effect of flexible exchange rate regime adopted during financial crisis, the data set only contain 2010-2017 data.

4.2 Application and Empiric Results

The estimation results of VAR (1) are shown in table 1.

Table 1: VAR (1) Result's Summary

Variables	Coefficients	Standard Deviations	t-Values
PARİTE(-1)	23.12826	9.65517	2.39543
PARİTE(-2)	-21.57932	14.4439	-0.39935
PARİTE(-3)	-5.768216	14.4439	-0.39935
PARİTE(-4)	-10.53824	13.9043	0.23328
PARİTE(-5)	3.246418	13.9163	0.23328
PARİTE(-6)	37.01471	14.1224	2.62100
PARİTE(-7)	-19.50277	9.60917	-202960

In lag 1 and 6 the coefficients are significant and the relationship is positive. But in lag 2,3,4 and 5 the coefficients are not significant. However, for lag 7, the coefficient is significant but negative. To see the elaborate effect of shock to parity, impulse response function is given below.

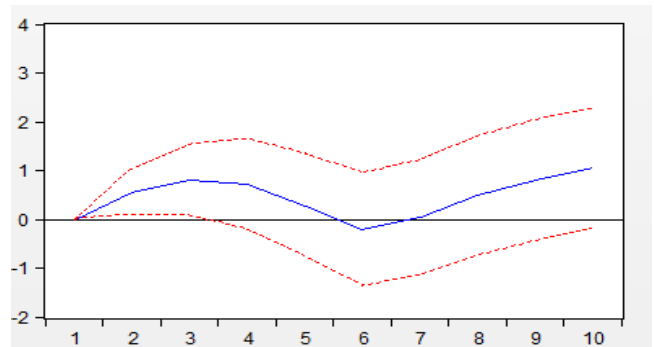


Figure 1: Response of REER to PARİTE

As it can be seen from figure1 that when one standard deviation shock is given to PARİTE there is no immediate response of REER but from lag 2 to lag 5 REER responds positively. In lag 6 and 7 there is a small but negative response. After that the response is again positive.

It is found from the first model that real effective exchange rate and parity has statistically significant relationship as expected but the sign is not consistent over time. But mostly the relationship is positive. That means, increase in the parity leads to increase in real effective exchange rate which also means increase in the value of Turkish lira in terms of other currency. This may have some negative consequences as export become expensive due this and lessen the competitiveness of Turkish exports.

5. Effect of Dolar-Euro parity on Gross Domestic Products (GDP)

In this part, to measure the effect of dollar-euro parity on the real GDP of Turkey another simple model is formed. Like the first model, by using VAR method the second model will also be estimated.

5.1 Model 2 and Data Set

In the second model, real GDP (GSYİH) is the dependent variable and dollar-euro parity (PARİTE) is the independent variable. Equation 6 represents the simple model.

$$GSYİH_t = \beta_1 + \beta_2 PARİTE_{t-1} + \beta_3 PARİTE_{t-2} + \epsilon_t \quad (4)$$

For the second model, GDP data is collected from World Bank database and parity data is collected from ECB. Both parity data of dollar-euro and GDP data starts from 2010q1 to 2017q2. To see the effect of flexible exchange rate regime adopted during financial crisis, the data set only contain 2010-2017 data.

Like the VAR(1), the VAR(2) model is also stable. The lag criteria is selected for VAR(2) is lag 2.

5.2 Application and Empiric Results

From the VAR (2) estimation results given in table 2, it is clear that no coefficient is significant.

Variables	Coefficients	Standard Deviations	t-Values
PARİTE(-1)	1943.192	1239.6	0.15679
PARİTE(-1)	-9500.064	125679	-0.75628

The Granger causality test with block exogeneity also confirms that dollar-euro parity does not lead to GDP fluctuation. However, the impulse response functions given in figure 2 shows something else.

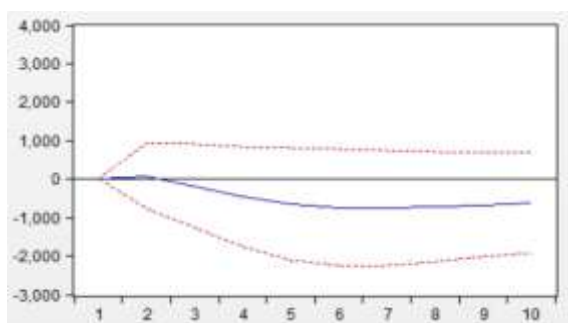


Figure 1: Response of GDP to PARITY

As it can be seen from the figure2 that upto lag 2 there is no response of GDP to one standard deviation shocks to parity. But after that there is consistent negative response to the shock.

Although, there were no strong relationship between GDP and parity but after lag 3 there is negative response to shocks to parity. This indicates that there is a long run relationship between parity and GDP.

6. Conclusion

The aim of this study was to find whether currency wars affect developing countries or not. Turkey was taken as a representative of developing country which is ideal an example of small open economy. For measuring the effects of currency wars, dollar and euro is considered as they are the most used currency world wide. In this regard the effect of dollar-euro parity on real effective exchange rate and real GDP of Turkey are the main concerns of this paper. To see the effect of flexible exchange rate regime adopted during financial crisis, the data set only contain 2010-2017 data.

By using VAR models, it is found that, dollar- euro parity affects Turkish economy indirectly through real effective exchange rate. The real GDP is also affected in the long run. The study only considered post financial crisis flexible exchange rate regime, where adjustments are quicker than other exchange rate regimes. Therefore, exchange rate policies should be taken considering the effects of external factor like dollar-euro parity while making macroeconomic policies.

From the study, as a whole it is found that currency wars affects the economy of Turkey, most likely adversely. The findings might also be valid for other developing countries like Turkey. To find definite effects of currency wars, it is recommended that future study should include more than one parity and individual sectors that are directly or indirectly related to foreign currencies should be analyzed separately.

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