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THE IMPACTS OF EXCHANGE-RATE POLICIES ON THE FOREIGN TRADE: THE CASE OF TURKEY

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ABSTRACT

This study aims at exploring the effects of exchange rate policies on the foreign trade. In order to capture this effect, foreign exchange rates and terms of trade are analyzed both theoretically and within the context of their historical development. As well as theoretical relationship of these variables, their development and application especially after 1980 in Turkey are also studied. Throughout this article, causality relation and its direction between exchange rate and foreign trade has been studied. They are analyzed with Granger causality test and regression analysis based on 1980-2006 yearly data. It is seen that foreign exchange rates have undeniable however in the short term- effects on the terms of trade but moreover, in the long term the general durability and productivity is more vital.

Keywords: *Exchange Rate, Foreign Trade, Turkish Economy*

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INTRODUCTION

Starting after World War II and having still continued throughout years, rapid changes existed in world exchange markets that have tried to succeed in the economic integration. The phenomenon which has dominated the exchange markets since the collapse of Bretton Woods system in 1973 is uncertainty. After the domestic currency of the developed countries had been transformed from stationary exchange rate system into free floating, the variability of the exchange rates increased and it became very difficult to envisage the value that it would take in the future. The volatile structure of the capital flows causes fluctuations in the variables like the exchange rate, foreign reserves, monetary aggregates and foreign trade, which are generally the main or intermediate policy instruments of the central banks. Such fluctuations

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are associated with several negative outcomes like the ineffectiveness of the monetary policy.

Exchange rate policies pursued in an economy have the major role in determining the main macroeconomic variables, such as foreign trade balance, growth, inflation and stability. The economic crises which have been experienced in Turkey since the 1950s generally focus on the foreign exchange bottleneck. Until the 1980s, devaluation was applied within the exchange rate system, as well as the monetary and fiscal policies to cope with the crises. Since the 1980s, the foreign exchange regime has been liberalized and it has been targeted that the exchange rate is gradually determined by market mechanism of exchange rate. In this study, the relationship between foreign trade and real exchange rate is first held on a general basis, and then analyzed by using. Turkey as an example Econometric analysis is composed of three steps. The first step is the decomposition of the real exchange rates by using co-integration. The second step is the Granger causality test and the third step is the regression analysis.

The foreign exchange rate policies implemented became a very important means of determining the economy policies which are pursued by the national governments; because of the liberalization of trade, very rapid and free capital movements. Recently, international organizations have been intensively discussing the exchange rate policies to be implemented in developing countries like Turkey and putting forward several solution proposals. Even though the exchange rates regimes in developing market economies generally do not happen as regular entrances but as the changes in regime which are forced by crisis, the selection of optimum exchange rate regime is important in reducing the fragileness of the countries against crisis. On the grounds that Turkey is among the developing countries, the quality of exchange rate policies to be implemented in the country becomes a critical issue. Foreign exchange regime is an important factor in determining the real value of the domestic currency of a country and influences the economy in many aspects. For this reason, the selection of a foreign exchange rate regime in an economy is of vital importance. The high degree of volatility of exchange rate movements since the beginning of the generalized floating exchange rate regime has led policymakers and researchers to investigate the nature and extent of such movements on trade flows. There is conflicting evidence in the literature about the relationship between exchange rate volatility and trade flows (Özbay, 1999: 2).

Basically, the real exchange rate can be defined as the nominal exchange rate that takes the inflation differentials among the countries into account. Its importance stems from the fact that it can be used as an indicator of competitiveness in the foreign trade of a country. The importance of the real exchange rate for a Central Bank is related with the effects of the real exchange rates on the central bank balance sheet and, in return, with its ability to conduct a prudent monetary policy. Any

changes in the real exchange rates would lead to fluctuations in foreign trade (Kıpıcı & Kesriyeli, 1997: 2).

LITERATURE

Since the early 1980s, international capital has started freely to draw a direction for itself in the framework of yield differences between countries by the steps taken for financial liberalization. Especially in developing countries, national currency gained value by capital inflows, consumption, investment expenditure and export increased, and growth process accelerated; On the other hand, rapid capital inflows and outflows have brought some problems together which have affected the real economy through exchange rates and interest rates. Acceleration of the capital inflow results in the exchange rate instability and over-valuation of the national currency in the rate. Hence, export goods become cheaper, and decrease in exports and regression in the sectors producing these goods emerge. Monetary debts ascend and current account deficits increase as well (Yeldan, 1996: 49). Banking system faces some risks due to the policies regulating sterilization and exchange rate changes and therefore financial vulnerability increases and macroeconomic balances are deteriorated (Mishkin, 2001: 26-27).

Many researches have been carried out to explain whether foreign trade is influenced by exchange rates. It is supported by a wide range of people that the exchange rate variability affects negatively the foreign trade volume: Cushman, 1988: Doğanlar, 2002: Akhtar & Hilton, 1984: Kenen & Rodrik, 1986: Thursby & Thursby, 1987: De Grauwe, 1988: Pere & Steinherr, 1989: Koray & Lastrapes, 1989: Chowdhury, 1993 and Arize, 1995, 1997. Similarly, there exist studies in literature, which elaborate on Turkey. Özbay (1999) found in his study by using the trimester data of 1988- 1997 that the foreign exchange rate uncertainty in Turkey has statistically meaningful negative effects on export. In the study of Doğanlar (2002), in which the trimester data of 1980-1996 have been used, the finding that the exchange rate uncertainty negatively affects the export has been obtained. In the studies carried out by Öztürk and Acaravcı (2002, 2003), a negative relation between the exchange rate variability and foreign trade has been determined.

In short although there are a number of empirical studies in literature which examine the relation between real exchange rates and foreign trade prices, the direction of the relation cannot be reached. These complicated results in literature stem from the data measurements and the examined period differences (Kearney & Monadjemi, 1990: 202-203).

METHODOLOGY

VAR technique which was developed by Sims (1980), Litterman (1979), Doan (1984) has been used for testing empirically the interactions among real exchange rate, export price index and import price index series. Contrary to the structural models, VAR technique gives more flexibility to the model for it does not require some restrictions beforehand. Moreover, this technique is highly beneficial to express the interactions between variables as a system (Zengin, 2000: 31).

It is debated whether the variables within the VAR system should be stationary. The main argument against the difference extraction is that it causes information losses related to the co-movement in the data. The common opinion on this subject is that the variables in the system are obtained from a real data derivation procedure (Enders, 1995: 310-311).

Recent empirical studies have attempted to test whether the use of first differences or levels of data set in model forecast is more suitable or not. Statistical techniques are for determining whether the data are generally stationary or not, that is to say, whether average and variances of the data change or not in time. Determination of this qualification of the data is considerably important. The analysis of the forecasts made through non-stationary series is to be evaluated differently from those of the forecasts made by using stationary series.

In this research, as a result of the flexible exchange rate regime, foreign trade model has been used for the uncertainty of exchange rate:

$$\ln Y_t = \beta_0 + \beta_1(\ln X_t) + \varepsilon_t \qquad (1)$$

Definitions and assumptions related to the variables in the model are as follows:

Y_t: Foreign Exchange Rate
X_t: Foreign Trade Rate

Variables in the VAR assumptions which have been established in this research have been used at the level values as suggested by Sims (1980) and Doan (1992). Model is composed of two variables, namely Real Exchange Rate (K) and Foreign Trade Volume (DTH).

Data set is composed of logarithmic data which have been subject to annual and seasonal correction for the period of "1980–2006". The most suitable delay length for the system has been chosen as four months. Degree of lag length has been determined according to Awake Information criterion. In addition to that, the time series features of the series to be in the system have been examined "separately" and "together" via Augmented Dickey Fuller (ADF) and Johansen – Juselius techniques.

RESULTS OF ANALYSIS

In this section, tests carried out for the solution of the model and their results are explained. Econometric packet program is used for carrying out the tests.

Unit Root Test

Stationarity analysis of the series in this research has been carried out by the use of ADF unit root test. Results of ADF unit root test are given in Table 1.

Table 1: Augmented Dickey Fuller Unit Root Analysis Results (ADF)

Variable	Constant McKinnon Critical Values				Constant Time trend McKinnon Critical Values			
	ADF	1 %	5 %	10 %	ADF	1 %	5 %	10 %
DK	-3.4048	-3.7204	-2.9850	-2.631	-4.272	-4.373	-3.602	-3.236
DDK	-8.3923	-3.7343	-2.9907	-2.634	-8.214	-4.394	-3.611	-3.241
DTH	-3.1121	-3.7204	-2.9850	-2.631	-3.986	-4.373	-3.602	-3.236
DDTH	-4.07940	-3.7343	-2.9907	-2.634	-5.020	-4.394	-3.611	-3.241

As seen from the Table 1, results are presented related to the stationarity of the variables which have been used in research through ADF test. According to these results, absolute values of ADF statistics belonging to the level values of foreign exchange rate and foreign trade variables are not stationary as they are lower than the absolute values of McKinnon critical values at different significance levels. Thus the first difference values of variables have been taken. According to these results, absolute values of ADF statistics belonging to the first differences values of variables is stationary as they are higher than the absolute values of McKinnon critical values at different significance levels.

Co-integration Test

Multivariate co-integration technique developed by Johansen (1988, 1991) and Johansen and Juselius (1990, 1992), which enables the forecasts to be made by maximum feasibility method, has been used. This method is much more convenient compared to other methods as it enables the testing of different hypotheses and as it is practical even when there are some variables I(0) (Hansen & Juselius, 1995).

It is first necessary in co-integration test to determine how many delayed values of the variables in the used VAR model will take part. In the research, lag length of VAR model has been determined as 1 via Akaike information criterion (AIC).

Table 2: Johansen Co-integration Test Results

Eigenvalue	Likelihood Ratio	5 Percent Critical Value	1 Percent Critical Value	Hypothesized No. of CE(s)
0.399171	19.30752	15.41	20.04	None
0.231147	6.771389	3.76	6.65	At most 1

Results of Johansen co-integration test are given in Table 2. Comparison of maximum eigenvalue and trace statistics calculated with the critical values taken from Osterwald-Lenum (1992) study shows the existence of co-integrated vector at the level of 5% and 1%. The existence of the co-integration between variables means a causality relation at least in one direction, as stated by Granger (1988) as well. In addition to co-integration analysis, a causality analysis has also been carried out to determine the dynamic relations between two variables.

Causality Test

Granger causality test has been carried out to determine the direction of the relation between the variables. Granger's causality test is carried out with the help of equations below:

$$Y_t = \alpha_0 + \sum_{i=1}^{k_1} \alpha_i . Y_{t-i} + \sum_{t=1}^{k_2} \beta_i . X_{t-i} + \varepsilon_t \qquad (2)$$

$$X_t = \chi_0 + \sum_{i=1}^{k_3} \chi_i . X_{t-i} + \sum_{i=1}^{k_4} \delta_i . Y_{t-i} + vt_t \qquad (3)$$

In the equation (2), if β indis coefficients are found to be different from zero at a certain level, the conclusion that X is the cause of Y is arrived. Similarly, in the equation (3), the fact that coefficients are different from zero at a certain level is the indicator of that Y is the cause of X (Granger, 1969: 431).

Table 3: Granger Causality Test Result

Granger Causality Tests			
Sample: 1980 2006			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Probability
DTH does not Granger Cause DK	26	1.72804	0.20312
DK does not Granger Cause DTH		1.08131	0.35817

*F α (m, n-k) =0, 05 (2, 26) =3, 39

The F value calculated and the F value in the Table 3 is compared and a conclusion is reached. Because the calculated F value is lower than the critical F value, the hypothesis that there is not causality from DK to DTH is accepted. In the same way, because the calculated F value is lower than the critical F value, the hypothesis that there is not causality from DTH to DK is accepted. According to Granger causality analysis, foreign exchange rate in Turkey does not affect foreign trade volume. In the same way foreign trade volume in Turkey does not affect foreign exchange rate. In this sense, carrying out a regression analysis in which the exchange rate is taken as outcome variable will not be meaningful in economic terms.

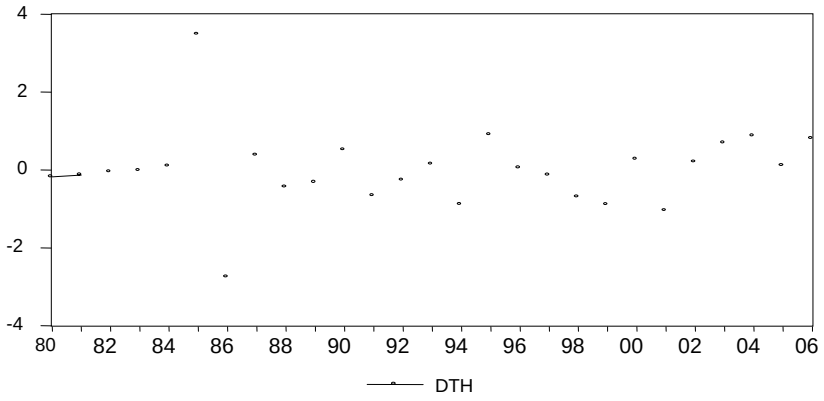

Figure 1: Foreign Trade Volume (1980-2006)

Source: Central Bank of the Republic of Turkey

When looked at Figure 1 demonstrating the development in foreign trade volume, a revival has been seen in foreign trade together with the liberalization movement in 1989. It is seen that it came to a short standstill due to the economic crisis experienced in 1994 and after that it has increasingly developed. An increase is observed in the percentage rate of change in 1995. A floating regime has been pursued after 2000.

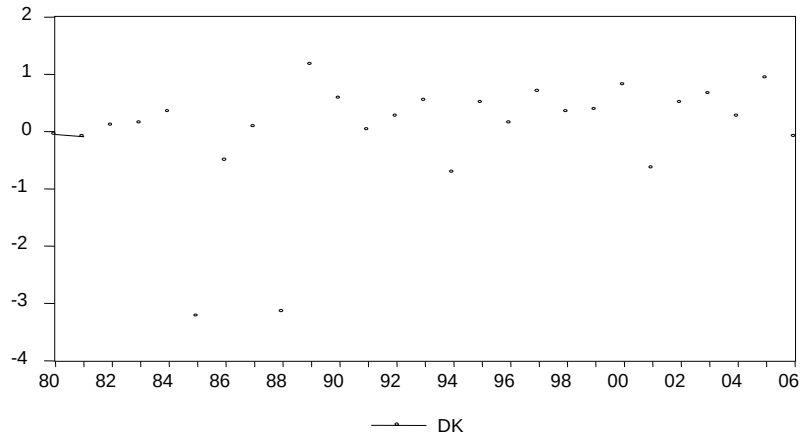

Figure 2: Foreign Exchange Rate Ratio (1980-2006)

Source: Central Bank of the Republic of Turkey

When Figure 2 demonstrating the changes in foreign exchange rate by percentage is examined, it can be seen that the change in exchange rate has been in floating regime. The change in exchange rate has been determined to show a significant jump in 1989 and 1994 due to the high devaluation made during the economic crisis. An increase in the change in the foreign exchange rate, which started to fall down as of 2000, has been observed due to the applied economic program based on "nominal anchor". However, in spite of the "free floating policy", which was applied since 2001, the change in foreign exchange rate gradually decreased and even a negative change was observed in 2003 and in the period until July of 2004. As a result of this, Turkish Lira became considerably valuable in real terms.

The effect of the change in foreign exchange rate by percentage (DK) on the changes of foreign trade volume (DTH) is analyzed.

Table 4: Regression Analysis Results

Dependent Variable: D(DK)				
Sample(adjusted): 1980- 2006				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
DTH	-0.601438	0.273205	-2.201421	0.00376
C	9.309278	8.329012	1.117693	0.02748
R-squared	0.168003	Mean dependent var		-0.038462
Adjusted R-squared	0.507906	S.D. dependent var		39.24621
S.E. of regression	36.53617	Akaike info criterion		10.10829
Sum squared resid	32037.40	Schwarz criterion		10.20506
Log likelihood	-129.4077	F-statistic		4.846256
Durbin-Watson stat	3.105041	Prob(F-statistic)		0.037564

It is understood that the percentage changes in foreign exchange rates in Turkey are explained by the changes in foreign trade rates. As it is known, the common opinion in the literature is that there is a negative relation between real foreign exchange rate and foreign trade level, and the changes in the exchange rate are considerably changed at the foreign trade level. The results of the regression model, which we have applied on Turkey, are significantly consistent with this dominant opinion in the literature. The level of the relation between foreign exchange rate and foreign trade volume is considerably high. That the R value of the model is 0.5079 indicates that 50% of the changes observed in the foreign trade volume can solely be explained by the changes in exchange rate.

CONCLUSION

Different exchange rate policies have been applied at different periods in Turkey. It is understood that applied exchange rate have important effects on economy. In this context, the fact that economy has faced gradually increasing crises since the 1990s cannot be considered independently from the exchange rate policies applied in this period. Considered from this perspective, it is also possible to say that the applied exchange rate policies have created important effects on foreign trade. In this study main determinants of foreign trade and the impact of adverse effects of the real exchange rate uncertainty on foreign trade in Turkey for the period of 1980-2006 are tested. The basic finding of this paper is that real exchange rate and foreign income are significant in determining foreign trade. While real exchange rate uncertainty significantly reduces the exports, it is not significantly effective on the imports. The adopted monetary policy during the last two years that targets the real exchange rate is very important in terms of reducing the exchange rate volatility and improving the trade performance

In conclusion, these observations carried out related to Turkish economy in the period between 1980 and 2006 show that there is a backward relation between exchange rate and foreign trade volume.

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