FOREIGN TRADE CAUSALITY AMONG THE EUROPEAN UNION (EU) AND TURKEY

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Abstract.*Turkey performs nearly half of its'foreign trade with the European Union (EU). Turkey has actualized the Customs Union agreement with the EU. The aim of this study is to verify whether there is a causality relation in the foreign trade between Turkey and the EU. The yearly Turkish import and export data to the EU has been used during this study. The data used is for the 1996-2009 period. The relationship between the variables have been researched through the usage of the Granger causality test. The empirical results have demonstrated the absence of Granger causality between imports and exports during the period after the EU.*
Keywords*: European Union, export, import, Granger causality*

JEL CLASSIFICATION: F100, F140

INTRODUCTION

Turkey performs nearly half of it's exports to the European Union(EU) countries. The EU share in Turkey's imports is a little bit less. The foreign trade activity has evolved rapidly after the year 1996 following the Customs Union Agreement concluded with the EU. Turkey's high volume of trade activity with the EU can be explained by the geographic proximity and similarity of consumer preferences (Ağır & Metin, 2016, p.13) [1]. The Customs Union agreement effective as of 1st January 1996 between Turkey and the EU has led to the implementation of various amendments in the Turkish trade and competition regulations and policies and while creating new opportunities for the Turkish economy, has also led to the emergence of certain factors needing efforts.

The Customs Union comprises industrial commodities and processed agricultural products, and foresees the cancellation of customs duties, co- taxes, quantity restrictions and co-taxeffective measures. The Customs Union's average customs tariff has been accepted for the products being imported from third party countries.

Following the Customs Union membership Turkey's foreign trade has concentrated on the EU with an increasing velocity in terms of imports and exports. A part of these transactions have been realized within the scope of the "Inward Processing Regime". That is, Turkey being highly external dependent on raw materials and intermediate goods, imports extensively the subject input goods from the EU, treats them in Turkey and exports them again to the EU within a given period.

The products subject to the trade activity between the EU and Turkey consist mainly of automotive and chemical products and iron and steel sectors. The trade activity between the EU and Turkey can be considered as an intra-industry trade.

The foreign trade deficit is an important issue for the developing countries. Therefore curiosity exists to identify the relationship between exports and imports. Mukhtar and Rashed (2010) have detected a two-way causality between the export and import in Pakistan as a result of the Granger causality test performed through the usage of the 1972-2006 period three month data analysis [6]. Narayan and Narayan (2005) have detected relationship between exports and imports for only 6 countries as a result of the test performed for 22 under-developed countries [7]. Sekman and Saribas (2007) have detected a two-way causality between exports and imports in Turkey by the usage of 1998-2006 period data [8]. Hussain and Saaed (2015) have detected a one-way causality from exports to imports in Tunisia during their study performed for the 1997-2012 period [5]. El Alaoui (2015) has detected a one-way causality from exports to imports for Morocco by using the 1980-2013 period data as a result of the Granger causality test [3]. Çelik and Tuncay (2016) have detected a one-way relationship from imports to exports for Turkey by the usage of the 1989-2015 three months data [2].

During this study a causality relationship research has been performed regarding the trade activity between the EU and Turkey. Statistically causality is to obtain the estimated future value of a time series variable through being influenced by the past period values of itself or a related other time series variable. A Granger Causality analysis has been performed to define the direction of the relationship between the time series.

DATA AND METHODOLOGY

The data used during the study has been obtained from the Turkish Republic Central Bank's electronic data base and Turkish statistical institute and have been included in the model by taking the logarithms of the series. The 1996-2019 yearly data concerning Turkey's export and import variables for the EU has been used during this study.

In course of the studies to be effectuated through the usage of time series for model estimations, the analysis to be performed with non- stationary series will give spurious results (Engle and Granger,1987, p.253) [4]. The stationarity of variables will be researched by the usage of the Augmented Dickey Fuller Test and the Granger causality test shall be applied in accordance with the results.

Two main objectives need to be attained during the Granger causality tests. The first objective is to review whether there is a relation between the independent and dependent variables. The second is to determine the direction of the relations between the variables during the causality tests. The equations below show the Granger causality process.

$$Y_t = \sum_{i=1}^{n} \alpha_i Y_{t-i} + \sum_{j=1}^{n} \beta_j X_{t-j} + u_{1t}$$

$$X_t = \sum_{i=1}^{n} \lambda_i Y_{t-i} + \sum_{j=1}^{n} \sigma_j X_{t-j} + u_{2t}$$

Four different results may arise at the end of the Granger causality test. Turkey's exports may be influenced by the EU's imports, Turkey's imports may be influenced by the EU's exports and exports and imports may influence each other reciprocally. Another result is that the trade between Turkey and EU is not affected from each other.

EMPIRICAL RESULTS

The suitable lag length in the VAR (Vector aoutoreggresive) model needs to be detected before performing the Granger causality test. The suitable lag length shall be determined by using various criteria during the VAR analysis. The lag length results are displayed in Table-1. The appropriate lag length has been found as 1 accordingly.

Table 1- The lag lenght results

Lag	LogL	LR	FPE	AIC	SC	HQ
0	18.45095	NA	0.000221	-2.741826	-2.661008	-2.771747
1	29.90310	17.17822*	6.52e-05*	-3.983850	3.741396*	-4.073615
2	34.40872	5.256558	6.53e-05	4.068120*	-3.664031	-4.217728*
3	36.58881	1.816744	0.000111	-3.764802	-3.199077	-3.974253
4	40.51366	1.962424	0.000196	-3.752276	-3.024916	-4.021571

The stationarity test results of the variables are shown in Table-2. Accordingly while the exports stationary in the first difference import have been found to be level stationary. The relationship between the variables could have been researched also by using the Cointegration analysis. Nonetheless the stability degree differences has prevented the cointegration analysis between the series.

Table 2- The stationarity test results

Variables	**T-Statatistic**	**Prob.**
Logex	-1.177710	0.6566
Dlogex	-3.496243	0.0249
Logimp	-2.756502	0.0867

Table 3- Granger causality test

Null Hypothesis:	F-Statistic	Prob.
DLOGEX does not Granger Cause LOGIMP.	0.66815	0.4296
LOGIMPORT does not Granger Cause DLOGEX	0.12325	0.7316

The Granger causality results are shown on Table-3. The hypotheses are refused that export is reason of import and import is reason of export. Accordingly a mutual influence does not exist between export and import within Turkey's trade with EU. This situation shows that the influence of inward processing application is low.

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