

Is a Regional Trade Agreement with Balkan Countries Applicable for Turkey? A Time Series Analysis

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Abstract: *Statistics of Central Bank of the Republic of Turkey (CBRT) and World Bank (WB) imply that the foreign trade volume of Turkey with its major trade partners in the Balkans (Bulgaria, Greece and Romania) may have a positive effect on Turkey's economy even under the circumstances of the recent financial crisis. In this respect, on the basis of Vector Error Correction (VEC) model, Granger causality analysis has been performed to make inferences about the consequences of a possible regional trade agreement of Turkey with Bulgaria, Greece and Romania on the real economic activity in Turkey. Thereby, it is aimed to determine whether it is reasonable for Turkey to make a regional trade agreement with Bulgaria, Greece and Romania. Empirical findings reveal that Turkish economy may*

Keywords:

Regional Trade Agreements, Balkan Countries, Causality Analysis

JEL Classification:

F10, F14, F15.

Article History

Submitted: 11 Jun 2013

Resubmitted: 17 Sept. 2013

Accepted: 26 September 2013

Introduction

Economic growth and competitiveness depend on the realization of investments and gross fixed capital formation and accordingly increasing economic growth may lead to an expansion of international trade. Besides, historical and cultural connections promote trade relations.

Turkey, as a Balkan country, has historical, cultural and political ties with other Balkan countries and economic relations have been growing especially after the collapse of the Eastern Bloc. As shown in Table 1, foreign trade volume of Turkey with its major trade partners (Bulgaria, Greece and Romania) in the Balkans has been increasing gradually from 1990. Thus, GDP of Turkey may be affected positively by the increasing foreign trade volume with Bulgaria, Greece and Romania.

Table 1. Foreign Trade Volume of Turkey with Bulgaria, Greece and Romania (Million \$) and GDP Growth Rates (%)

Years	Foreign Trade Volume of Turkey with Bulgaria	Foreign Trade Volume of Turkey with Greece	Foreign Trade Volume of Turkey with Romania	GDP Growth Rate of Turkey (%)	GDP Growth Rate of Bulgaria (%)	GDP Growth Rate of Greece (%)	GDP Growth Rate of Romania (%)
1990	42	268	286	9,27	-9,12	0,00	-5,60
1991	216	221	304	0,72	-8,45	3,10	-12,90
1992	297	234	429	5,04	-7,27	0,70	-8,84
1993	329	239	452	7,65	-1,48	-1,60	1,51
1994	329	274	404	-4,67	1,82	2,00	3,97
1995	585	411	670	7,88	2,86	2,10	7,16
1996	520	521	755	7,38	-9,03	2,36	4,01
1997	585	729	753	7,58	-1,65	3,64	-6,10
1998	581	690	813	2,31	4,86	3,36	-4,79
1999	529	694	669	-3,37	1,96	3,42	-1,20
2000	718	869	1.000	6,77	5,70	4,48	2,10
2001	693	742	873	-5,70	4,20	4,20	5,70
2002	889	903	1.228	6,16	4,70	3,44	5,10
2003	1.311	1.348	1.829	5,27	5,50	5,94	5,20
2004	1.848	1.759	2.925	9,36	6,70	4,37	8,40

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2005	2.369	1.851	4.069	8,40	6,40	2,28	4,17
2006	3.231	2.648	5.019	6,89	6,50	5,51	7,90
2007	4.012	3.213	6.757	4,67	6,40	3,54	6,00
2008	3.992	3.581	7.535	0,66	6,20	-0,21	9,43
2009	2.506	2.765	4.474	-4,83	-5,50	-3,14	-8,50
2010	3.199	2.997	6.048	9,16	0,40	-4,94	0,95
2011	4.097	4.123	6.677	8,50	1,70	-7,10	-0,37

Source: Central Bank of the Republic of Turkey and World Bank

In this study, we examine whether regional integration between Turkey and Balkan countries (Bulgaria, Greece and Romania) may promote the real economic activity in Turkey, whereupon it is attempted to determine whether it is reasonable for Turkey to make a regional trade agreement with Bulgaria, Greece and Romania. Thus, we examined the causal relations among GDP of Turkey and foreign trade volume of Turkey with Bulgaria, Greece and Romania using Vector Error Correction (VEC) model framework.

Theoretical Considerations and Previous Research

Various researches have investigated the welfare implications of regional trade agreements and their impact on the global economy. Beginning with contributions by Viner (1950) and Meade (1955), regional integration arrangements have been widely studied in economic analysis. Viner (1950) concluded that regional integration might be predominantly trade diverting and therefore welfare reducing. Thus, regional integration arrangements have failed to yield universally applicable policies. However, economic theory says that a regional integration agreement can be structured in a way that creates gains for the member countries without harming any nonmembers (McMillan, 1993, p. 2). Viner (1950) also suggested that the theory of second best implying that reducing tariffs under a regional integration arrangement moving in the direction of Pareto optimality does not guarantee an improvement in welfare for individual countries or the world economy as a whole (DeRosa, 1998, p. 21). According to the economic theory, it is possible for regional agreements to avoid harm to outsiders while improving their own welfare. Chang-Winters (2002) found that preferential trade agreements reduced trade diversion and harmed nonmembers by reducing the prices of imports from nonmembers. It is denoted that the neoclassical Ricardian model is failed to provide an adequate empirical framework to explain the growth of open economies (Robinson, 1999, p. 10).

Although regional trade agreements are questioned whether they increase welfare, research on regional trade agreements show that trade creation greatly exceeds trade diversion and increase welfare for all members. Regional trade integrations represent trade diversion by shifting production from an efficient nonmember country to a less efficient member country. According to the Kemp-Wan theorem; if a regional integration arrangement promotes exports from nonmember countries to the members, the welfare of nonmember countries and the world economy as a whole must improve (Robinson, 1999, p. 2).

Any change in trade policy produces gainers and losers. Member countries' welfare increase as new members join the regional trade agreement providing evidence that there are gains from expanding the regional trade agreements (Robinson, 1999, p. 15). Meade (1955) admitted the possibility of not only spillover effects of regional integration arrangements on non-member countries, but also feedback effects of international adjustments to the formation of regional integration arrangements on member countries themselves (De Rosa, 1998, p. 22). Empirical studies about foreign direct investment also demonstrated a positive incidence of regional integration on foreign direct investments (Montout-Zitouna, 2005, p. 2). In contrast to Viner (1950) and Meade (1955) who emphasized the association of gains from regional integration arrangements with scale economies, Corden (1972) set down that scale economies and market structure was not linked formally (De Rosa, 1998, p. 39). Bhagwati-Panagariya (1996) and Schiff (1996) concerned in the economic size of countries joining a regional integration arrangement and found that a small country is expected to gain more from joining a large regional integration arrangement than a small regional integration arrangement. Frankel, Stein-Wei (1995) concluded statistically significant results on the effects of economic size, distance and the existence of a regional trade agreement between partners on bilateral trade (Frankel, Stein-Wei, 1995, p. 73).

Baldwin-Venables (1995) described the domino theory of regionalism suggesting that countries seek to join regional trade agreements because of the fear of exclusion (Robinson, 1999, p.1). Regionalism is expected to result in economic integration of neighboring countries; (Oman 1996, van Liemt 1998) adopted technology, politics, institutions and culture besides neighborhood defining integration. Neighbor countries whose relative resource endowments are highly complementary are expected to expand their trade relations significantly by forming a regional trading bloc in order to derive particularly large benefits (DeRosa, 1998, p. 34).

Cairncross (1997) emphasized that the impetus from these driving forces is transmitted via reductions of transaction costs, in other words, via a decline of economic distance between the countries involved (Boden-Soltwedel, 2010, p. 2). Bhagwati (2004) and Schulze-Ursprung (1999) provided evidence that these reductions of transaction costs are expected to change income level, employment and growth rates. However, transaction costs are difficult to determine because of their heterogeneity. The most concise concept of economic integration defines economic integration to be the inverse of transportation (Boden-Soltwedel, 2010, p. 2). Krugman (1993) considered natural trading blocs among neighbor countries and found that low transportation costs contribute to welfare gains when these countries in a regional trade agreement.

Empirical Analysis

For understanding the nature of any non-stationarity among the different series and improving longer term forecasting over a model, VEC models can be used. Within VEC model framework, Granger causality analysisⁱⁱ has been performed for determining whether Turkey's foreign trade volume with Bulgaria, Greece and Romania is useful in forecasting GDP of Turkey. Analysis is carried for the period from the first quarter of 1990, after liberalization of the capital account of Turkey in 1989 to the fourth quarter of 2011. Data is on quarterly basis and following variables are used: the log of GDP for Turkeyⁱⁱⁱ; gdp_t^r , the log of foreign trade volume with Bulgaria, Greece and Romania^{iv}; $fbul_t^r$, $ftgre_t^r$ and $ftrom_t^r$. All series are in levels and derived from CBRT and OECD databases.

Unit Root Tests for the Time Series

For determining whether the variables used in the empirical exercise are stationary or not, we employ the most widely used unit root tests in the econometric literature namely the Augmented Dickey-Fuller (ADF). Since critical values of the test depend on the deterministic terms which have to be included, Pantula principle proposed by Pantula (1989) is followed^v.

Since all series included in the empirical analysis have a nonzero mean and a linear trend, unit root tests are implemented with constant and trend terms and for determination of the lag length of ADF test, Akaike Information Criteria (AIC) is employed. At the 1 percent significance level; all series in levels form are non-stationary, whereas all series are stationary in first-differences. All series are regarded as integrated of

order 1; thus we explored the possibility of cointegration relationship among the series.

Table 2. Augmented Dickey-Fuller Tests

Variables	ADF Test Statistic	Number of Lagged Differences
$gdp_t^{tr} (c, t)$	-2,68	1
$\Delta gdp_t^{tr} (c)$	-8,84	0
$ftbul_t^{tr} (c, t)$	-2,00	9
$\Delta ftbul_t^{tr} (c)$	-5,05	8
$ftgre_t^{tr} (c, t)$	-3,43	1
$\Delta ftgre_t^{tr} (c)$	-14,50	0
$ftrom_t^{tr} (c, t)$	-2,02	8
$\Delta ftrom_t^{tr} (c)$	-3,58	8

VEC Model

The Concept

The general framework of VEC model is based on a VAR(p) model with deterministic terms as represented below;

$$y_t = A_1 y_{t-1} + \dots + A_p y_{t-p} + D_t + u_t \quad (1)$$

where $y_t = (y_{1t} \dots y_{Kt})'$ is a vector of endogenous variables with K elements, A_i is the parameter matrix. u_t is an unobservable white noise process that has positive covariance matrix $E(u_t, u_t') = \Sigma_u$ (Lütkepohl, 2007, p. 88). Within the VAR model framework in (1), Equation (2) can be specified as a VEC model.

$$\Delta y_t = \Pi y_{t-1} + \Gamma_1 \Delta y_{t-1} + \dots + \Gamma_{p-1} \Delta y_{t-p+1} + u_t \quad (2)$$

In (2), Δy_t does not contain stochastic trends by the assumption that all variables can be at most $I(1)$. Thus, the long-run part Πy_{t-1} contains $I(1)$ variables and it must be $I(0)$. Π can be written as a product of $(K \times r)$ matrices α and β with $\text{rk}(\alpha) = \text{rk}(\beta) = r$; $\Pi = \alpha\beta'$ when $\text{rk}(\Pi) = r$. By premultiplying $\Pi y_{t-1} = \alpha\beta' y_{t-1}(\alpha'\alpha)^{-1}\alpha'$, $\beta' y_{t-1}$ is obtained. Thus, $\beta' y_{t-1}$ is $I(0)$ and contains co integrating relations. Π is the co integrating rank of the system since $r = \text{rk}(\Pi)$ linearly independent co integrating relations exist among the components of y_t . β is a co integration matrix, whereas the loading matrix α contains the weights attached to the co integrating relations in the individual equations of the model. Finally, Γ_i are referred as the short-run parameters (Lütkepohl, 2007, pp. 89-90).

For the determination of whether or not the linear combination of these variables are $I(0)$, we employed the widely used in the literature - Johansen co integration test - as represented below;

$$y_t = D_t + x_t \quad (3)$$

where $D_t = \mu_0 + \mu_1 t$ is the deterministic part with a linear trend term and x_t has a VAR representation as in equation 2. If $\mu_1 = 0$, $y_t - \mu_0 = x_t$ and thus (3) has the VEC form (Lütkepohl, 2007, pp. 111-112).

$$\Delta y_t = \Pi (y_{t-1} - \mu_0) + \sum_{j=1}^{p-1} \Gamma_j \Delta y_{t-j} + u_t \quad (4)$$

Within the framework of (4), the pair of hypothesis below is tested to determine the co integrating rank of the system (JMulTi 4.23 Help System).

$$H_0 = (r_0): \text{rk}(\Pi) = r_0 \text{ versus } H_1 = (r_0): \text{rk}(\Pi) > r_0 \quad r_0 = 0, \dots, K-1$$

$$(5)$$

Table 3. Johansen Co integration Test

Series: gdp_t^{lr} , $ftbul_t^{lr}$, $ftgre_t^{lr}$, $ftrom_t^{lr}$			
No. of Included Lags (Levels): 9			
Null Hypothesis	Test Value	%95 Critical Value	%90 Critical Value
$r = 0$	56,46	63,66	70,91
$r = 1$	36,17	42,77	48,87
$r = 2$	16,84	25,73	30,67

Table 3 indicates that there exists one co integrating relation both among the variables (gdp_t^{lr} , $ftbul_t^{lr}$, $ftgre_t^{lr}$, $ftrom_t^{lr}$). Thus, causality relations among these variables are investigated within VEC model framework for making inferences about the effects of foreign trade volume of Turkey with Balkan countries on GDP of Turkey.

Granger-Causality Analysis

Granger (1969) has introduced a causality concept that has become quite popular in the econometrics literature. Accordingly, y_{2t} is to be causal for a time series variable y_{1t} if the former helps to improve the forecasts of the latter. For testing this property, a bivariate VAR(p) process of the form below can be considered (Lütkepohl, 2007, p. 144-145).

$$\begin{bmatrix} y_{1t} \\ y_{2t} \end{bmatrix} = \sum_{i=1}^{p+2} \begin{bmatrix} \alpha_{11,i} & \alpha_{12,i} \\ \alpha_{21,i} & \alpha_{22,i} \end{bmatrix} \begin{bmatrix} y_{1,t-i} \\ y_{2,t-i} \end{bmatrix} + CD_t + \begin{bmatrix} u_{1t} \\ u_{2t} \end{bmatrix} \quad (6)$$

The null hypothesis that y_{2t} is not Granger-causal for y_{1t} is tested by;

$$\alpha_{12,i} = 0, i = 1, 2, \dots, p + 1. \quad (7)$$

Accordingly, y_{2t} is not Granger-causal for y_{1t} if its lags do not appear in the y_{1t} equation. Granger-causality can also be investigated in the framework of the VEC model (Lütkepohl, 2007, p. 146).

$$\begin{bmatrix} y_{1t} \\ y_{2t} \end{bmatrix} = \alpha\beta' \begin{bmatrix} y_{1,t-1} \\ y_{2,t-1} \end{bmatrix} + \sum_{i=1}^{p-1} \begin{bmatrix} \gamma_{11,i} & \gamma_{12,i} \\ \gamma_{21,i} & \gamma_{22,i} \end{bmatrix} \begin{bmatrix} \Delta y_{1,t-i} \\ \Delta y_{2,t-i} \end{bmatrix} + u_t \quad (8)$$

Equation (8) is equivalent to $\gamma_{12,i} = 0$ ($i = 1, \dots, p-1$) and the element in the upper right-hand corner of $\alpha\beta'$ is also zero. If $r = 1$, α and β are (2×1) vectors and $\alpha\beta' = \begin{bmatrix} \alpha_1 \\ \alpha_2 \end{bmatrix} \begin{bmatrix} \beta_1 & \beta_2 \end{bmatrix} = \begin{bmatrix} \alpha_1\beta_1 & \alpha_1\beta_2 \\ \alpha_2\beta_1 & \alpha_2\beta_2 \end{bmatrix}$. In this case, $\alpha_1\beta_2 = 0$ needs to be checked besides $\gamma_{12,i} = 0$ and there must be Granger-causality in at least one direction since α and β both have rank one (Lütkepohl, 2007, p. 146).

On the other hand, y_{2t} is said to be instantaneously causal for y_{1t} if knowing the value of y_{2t} in the forecast period helps to improve the forecasts of y_{1t} . More precisely, y_{2t} is said to be instantaneously non-causal for y_{1t} if

$$y_{1,t+1|\Omega_t} = y_{1,t+1|\Omega_t \cup y_{2,t+1}} \quad (9)$$

where Ω_t is the set of all the relevant information in the universe and \cup denotes union. y_{2t} is instantaneously causal for y_{1t} , if and only if u_{1t} and u_{2t} are correlated (Lütkepohl, 2007, p. 146).

Table 4. Granger Causality Tests

Series: $gdp_t^r, ftbul_t^r, ftgre_t^r, ftrom_t^r$ No. of Included Lags (Levels): 10 H_0 : $ftbul_t^r, ftgre_t^r$ and $ftrom_t^r$ do not Granger-cause gdp_t^r		Series: $gdp_t^r, ftbul_t^r, ftgre_t^r, ftrom_t^r$ No. of Included Lags (Levels): 10 H_0 : No instantaneous causality between $ftbul_t^r, ftgre_t^r, ftrom_t^r, gdp_t^r$	
Test Statistic	p-value- F	Test Statistic	p-value- χ
3,54	0,00	16,17	0,00
Optimal lag lengths of the model are determined by the AIC.			

In our empirical exercise tests for causality are based on the estimation of the VEC(10) model with the time series vector $y_t = (gdp_t^r, ftbul_t^r, ftgre_t^r, ftrom_t^r)'$. Table 4 exposes that the two non-causality hypothesis can be rejected since the p-values of the tests are smaller than 0,05, both Granger-causal and instantaneous-causal relations among $ftbul_t^r, ftgre_t^r, ftrom_t^r, gdp_t^r$ is detected, revealing that increases in the foreign trade volume of Turkey with Bulgaria, Greece and Romania may lead to an expansion in the domestic real activity of Turkey, which in turn promote economic development.

Conclusion

Our findings reveal that making a regional trade agreement with Bulgaria, Greece and Romania may provide a strong competitive effect and increasing returns for Turkey. Besides, Turkey may benefit from spillover and feedback effects that may occur from a regional trade agreement with these countries. On the other hand, there may be limitations to signing the trade agreement among Bulgaria, Greece, Romania and Turkey since Greece is an existing member of the Euro area. However, there have been ongoing debates whether Greece should leave the Euro and return to the drachma. Thus, signing regional trade agreement with Bulgaria, Romania and Turkey may be an alternative to the Euro area and be advantageous for Greece. Since Greece has a relatively higher inflation rate than Bulgaria, Romania and Turkey; by signing a regional trade agreement, Greece may purchase goods from Bulgaria, Romania and Turkey at lower prices, which in turn have a positive impact on inflation. Furthermore, for overcoming the negative effects of the economic recession, Bulgaria, Greece and Romania may benefit from a possible regional trade

agreement since increased competition may lead to the rationalization of production and the removal of inefficient duplication of plants and may cause firms to cut prices and expand their sales.

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ⁱ Greece is a member of the Euro area, however in the wake of the political and economic problems in Greece, there have been ongoing debates whether the country should leave the Euro and return to the drachma.

ⁱⁱ For the details of the test, see (Granger, 1969, pp. 424–438)

ⁱⁱⁱ GDP series are extracted from OECD's database, expressed as indices and seasonally adjusted with base year 2005 = 100.

^{iv} Foreign trade volumes are obtained from CBRT's database.

^v Accordingly, if a linear trend term is needed in the test for y_t , only a constant term should be used for Δy_t 's test; if just a constant is necessary in the test for y_t , Δy_t 's test is carried out with no deterministic terms (Lütkepohl et al., 2007, pp. 54-55).