„Ekonomista" 2013, nr 2
http://www.ekonomista.info.pl

ISMET GÖÇER*
MEHMET MERCAN**
OSMAN PEKER***

The Effects of Exchange Rate Changes on The External Trade Balance

Introduction

The transition process to the market economy and globalization which has begun in 1980's and has accelerated in 1990's have made the economies more dependent to each other and more sensitive to the external events. The relationships between the foreign exchange policies and the external trade performance of countries have become a common subject of research (Hook, Boon, 2000). The knowledge about the effects of the changes in foreign exchange rates on external trade performance is very important to determine the foreign exchange policies for the developing countries (Taylor, Sarno, 1998).

In the fixed exchange rate systems, the decision of the government to increase the foreign exchange rate, in a country whose balance of payment runs into a deficit, is called devaluation, but revaluation appears when it is decreased (Narayan, 2000). When the foreign exchange rate is raised, relative prices of trade goods will change and this will cause some changes in supply and demand volumes. The increase in foreign exchange rate will cause an increase in the prices of imported goods in national currency and this will make the domestic demand turn to the local sources by limiting the demands for imported goods (Spitaller, 1980). The increase in foreign exchange rate will also decrease the price of exported good in foreign currency, so the external demand for the exported goods will increase (Lal, Lowinger, 2002).

The degree to which the rise in foreign exchange rates will decrease the import and increase the export depends on supply and demand elasticity of the exported and imported goods (Miles, 1979). In the Marshall-Lerner condition, the sum of demand elasticity of exports and imports in absolute value must be greater than one ($|\mu_m + \mu_x| > 1$) for devaluation having a positive impact on external trade performance (Thirwall, Gibson, 1986).

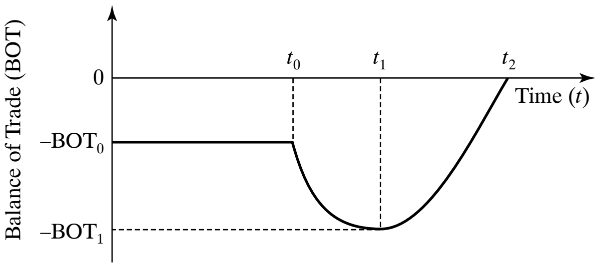
* Ismet Gocer, Ph.D. – Assistant Professor of Economics, Department of Economy, Adnan Menderes University, Aydin, Turkey; e-mail: igocer@adu.edu.tr
** Mehmet Mercan, Ph.D. – Assistant Professor of Economics, Department of Economy Hakkari University, Hakkari, Turkey; e-mail: mehmetmercan@hakkari.edu.tr
*** Osman Peker, Ph.D. – Associate Professor, Department of Economy, Adnan Menderes University, Aydin, Turkey; e-mail: opeker@adu.edu.tr

„Ekonomista” 2013, nr 2
http://www.ekonomista.info.pl

The raises in foreign exchange rate take much time to decrease the imports and increase the exports. While export revenues may be reduced, import expenses remain the same in the short run. Therefore, the balance of trade will be negatively affected by the devaluation in the short run. This is because price effect is higher than the volume effect in the first term (Singh, 2004). However, country will get the price advantage in exports in the long run and it will increase its export (Narayan, 2004; Peker, 2008). The relationship between devaluation and the balance of trade can be seen in Figure 1.

Figure 1

J-curve



In Figure 1, in point t_0 suppose that foreign exchange rate is increased while there is a trade deficit as much as BOT_0. This increase causes the balance of trade to deteoriate as much as BOT_0–BOT_1. After time t_1, the Marshall-Lerner condition becomes valid as a result of the orientation of the buyers to the new relative price and net exports will increase as a result of devaluation (Bahmani-Oskooe, Kutan, 2009). As Figure 1 looks like the *J* letter, this curve is called “*J*-curve”. In the econometric analysis, the short run analysis covers the t_0–t_1 period and the long run analysis covers the period after t_1. In order to say that *J*-curve effect works, the relationship between the foreign exchange rate and the balance of trade must be negative in the short run and positive in the long run (Singh, 2004; Peker, 2008).

We have divided the paper into four sections. In the second part following the introduction, an abstract of literature will be given, in the third part empirical analysis will be presented and the study will be completed with conclusions and suggestions at the end.

2. Literature review

Several studies have been worked out analyzing the relationship between the foreign exchange rate and the balance of trade, and different results have been obtained depending on countries and periods. Abstracts of some of these studies are given below in chronological order.

Arize (1994) has analyzed the relationship between the real foreign exchange rate and the balance of trade with 1973–1991 data for Korea, India, Indonesia, Malaysia, Pakistan, Philipins, Singapore, Sri Lanka and Thailand. He has shown that devaluation had positive effects on the balance of trade in all countries except India and Sri Lanka.

Bahmani-Oskooe and Niroomand (1998) analyzed whether the elasticities condition works or not using 1960–1992 period data and they have found that elasticities condition worked in many countries.

Baharumshah (2001) analyzed the effects of macroeconomic factors on the trade balance of the USA, Japan, Thailand and Malaysia with VAR model using 1980–1996 data

„Ekonomista" 2013, nr 2
http://www.ekonomista.info.pl

and found that foreign exchange rate was an important variable affecting the balance of trade in the long run.

Narayan (2004) has analyzed the relationship between the foreign exchange rate and the balance of trade with cointegration method using 1970–2000 data of New Zealand. He has not obtained any proof about the cointegration relationship between the foreign exchange rate and the balance of trade of New Zealand, but he has confirmed that *J*-curve phenomenon is valid.

Gianella and Chanteloup (2006) have analyzed the effects of the increases in foreign exchange rate on imports and non-oil exports with 1995–2004 data in Russia. They have seen that price elaticities are 0.6 in imports and 0.7 in exports and Marshall-Lerner condition works obviously. They have identified that increases in foreign exchange rate greater than 10% provide 1% improvement in balance of trade and the positive effects of the increase in the foreign exchange rate begin to be observed after three months.

Bahmani-Oskooee and Kutan (2009) have analyzed the validity of *J*-curve phenomenon in Bulgaria, Croatia, Cyprus, Czech Republic, Hungary, Poland, Romania, Russia, Slovakia, Turkey and Ukraine with the bounds testing methods and found that this phenomenon was valid in Bulgaria, Croatia and Russia.

Peker (2008) analyzed the relationship between the foreign exchange rate and the balance of trade for Turkey by using 1992–2006 data and he has reached the evidence that Marshall-Lerner condition does not work.

Jamilov (2011) has analyzed the validity of *J*-curve for Azerbaijan economy; by identifying how the balance of trade is affected during twelve months following the increase in the foreign exchange, he has proved that *J*-curve phenomenon is valid. However, Wen (2011) has shown that Marshall-Lerner condition does not work in China economy.

Wen (2011) has shown that Marshall-Lerner condition does not work in China economy. However Hsiao *et al.* (2012), on the other hand, have shown that Marshall-Lerner condition works in Chinese trade with Japan and *J*-curve phenomenon is also valid in its trade with EU countries.

3. The analysis

3.1. Data set

In this study, the balance of trade (*BOT*) of goods and services and exchange rate (*EXR*) annual data of the 1980–2011 period were analyzed for Bulgaria, Hungary, Poland and Romania, which are countries in transition to market economy, and Turkey. The balance of the trade of goods and services was expressed by dividing the exports to the imports. The data have been obtained from the World Bank and IMF web sites. The program Gauss 9.0 and the codes were generated for this program has been used for the analysis.

3.2. Method

Firstly, the dependence between the cross-sections in the panel (countries) has been analyzed with adjusted cross-sectional dependence Lagrange multiplier ($\mathrm{CDLM1}_{adj)}$ test Pesaran *et al.* (2008). Stationarity of the series has been tested with PANKPSS (Panel Kwiatkowski-Phillips-Schmidt-Shin), developed by Carrion-i-Silvestre *et al.* (2005) one of the second-generation unit root tests, considering the cross-sectional dependence, and the multiple structural breaks in series. The homogeneity of cointegration coefficients has been analyzed with the slope homogeneity test developed by Peseran and Yamagata

(2008). The existence of the cointegration relationship between the series has been analyzed by panel cointegration with multiple structural breaks, the method developed by Basher and Westerlund (2009), considering the cross-sectional dependence and the structural breaks in the cointegration equation. The long-run individual cointegration coefficients have been estimated by Common Correlated Effects (CCE) method, developed by Pesaran (2006) considering the cross-sectional dependency, and the long run panel's cointegration coefficients have been estimated by the Common Correlated Effects Mean Group (CCEMG) method, which was developed again by Peseran (2006); this method also considers the cross-sectional dependence.

3.3. Testing the Cross-Sectional Dependence

Considering cross-sectional dependence between the series or not is highly affects the results to be obtained (Breusch and Pagan, 1980; Pesaran, 2004). Therefore, before beginning the analysis, the existence of cross-sectional dependence in the series and the cointegration equation should be tested. This should be take into consideration when selecting the unit root and cointegration test methods. Otherwise, the analysis may give biased and inconsistent results.

The existence of cross-sectional dependence between the series is controlled by Berusch-Pagan (1980) CDLM1 test when the time dimension is greater than the cross-sectional dimension ($T > N$); by Pesaran (2004) CDLM2 test when the time and cross-sectional dimension together large, and by Pesaran (2004) CDLM test when the time dimension is smaller than the cross-sectional dimension ($T < N$). Since there are 5 countries ($N = 5$) and 32 years ($T = 32$) in this study, Breusch-Pagan (1980) CDLM1 test has been used. This test is biased when the avarage group is zero, but the avarage individual is different from zero. Pesaran *et al.* (2008) adjusted this deviation by adding the variance and the avarage to the test statistics, so it is called adjusted CDLM1 (CDLM1_{adj}) test. The original form of CDLM1 test statistic is the following:

$$\text{CDLM1} = T\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\hat{\rho}_{ij}^{2} \backsim \chi^{2}_{\frac{N(N-1)}{2}}. \tag{1}$$

With the adjustment, it becomes:

$$\text{CDLM1}_{adj} = \left(\frac{2}{N(N-1)}\right)^{\frac{1}{2}} T\sum_{i=1}^{N-1}\sum_{j=i+t}^{N}\hat{\rho}_{ij}^{2}\frac{(T-K-1)\hat{\rho}_{ij}-\hat{\mu}_{Tij}}{\upsilon_{Ti,j}} \backsim N(0,1). \tag{2}$$

Here $\hat{\mu}_{Tij}$ represents the average, υ_{Tij} represents the variance. The test statistic to be obtained here shows a standard normal distribution as asymptotic (Pesaran *et al.*, 2008). The hypotheses of the test are:

H_0: No cross-sectional dependence;

H_1: Cross-sectional dependence.

When the probability value obtained from test is smaller than 0.05, H_0 hypothesis is rejected at the 5% significance level and it is determined that there is a cross-sectional dependence between the units forming the panel (Pesaran *et al.*, 2008).

The existence of the cross-sectional dependence in the series and cointegration equation has been tested severally with CDLM1_{adj} method. The results are shown in Table 1.

According to the results given in Table 1, since the probability values are smaller than 0.05, H_0 hypothesis has been strongly rejected. It has been determined that there are cross--sectional dependency in series and cointegration equation. Since there is a cross-sectional dependence among the countries in the panel, a trade or foreign exchange rate shock coming from one of the countries affects the others. For that reason, individual countries should consider the policies of the other countries and the shocks affecting the balance of trade of these countries while applying their own trade and exchange rate policies. Also, cross-sectional dependence should be taken into consideration while selecting the next methods in the analysis.

Table 1

$CDLM1_{adj}$ test results

	Test statistics	Probability value
BOT	3.738	0.000
EXR	52.283	0.000
Cointegration equation	3.508	0.000

3.4. Panel unit root test

The panel unit root tests considering the information about both the time and the cross-sectional dimension of the data are found to be statistically stronger than the time series unit root tests considering the information only about the time dimension (Im, Pesaran and Shin, 1997; Maddala and Wu, 1999; Taylor and Sarno, 1998; Levin, Lin and Chu, 2002; Hadri, 2000; Pesaran, 2006; Beyaert, Camacho, 2008).

The first problem in the panel unit root test is whether the cross-sectional units forming the panel are independent or not from each other. Panel unit root tests here are divided into two as first and second generation tests. First generation tests are also divided into two as homogeneous and heterogeneous models. While the studies of Levin, Lin and Chu (2002), Breitung (2005) and Hadri (2000) are based on the homogeneous model hypothesis, other studies, eg. those by Im, Pesaran, Shin (2003), Maddala and Wu (1999), or Choi (2001) are based on the heterogeneous model assumption.

First generation unit root tests are based on the assumption that the cross-sectional units forming the panel are independent and all the units are equally affected by the shock to one of the units in the panel. However, it is more realistic to assume that units are differently affected by the shock to one of the units in the panel if it is thought that national economies are related with each other today. In order to overcome this deficiency, second generation unit root tests considering the cross-sectional dependence between the units have been developed. Main second generation unit root tests are: Taylor and Sarno's (1998) multivariate augmented Dickey Fuller (MADF), Breuer, Mcnown and Wallace's (2002) the seemingly unrelated regression augmented Dickey Fuller (CADF). These tests don't consider the structural breaks. When presence of the structural breaks in series, these methods give biased results (Charemza, Deadman, 1997).

In this study, since a cross-sectional dependence between the countries in the panel has been identified, stationarity of the series has been analyzed with one of the second generation unit root test proposed by Carrion-i-Silvestre *et al.* (2005) which considers the cross-sectional dependence and multiple structural breaks in the series. It also allows presence of structural breaks in each cross-section unit in the panel. The model of the test is like this:

$$Y_{i,t} = \alpha_{i,t} + \beta_{i,t}t + \epsilon_{i,t} \qquad (i = 1, 2, \ldots, N, t = 1, 2, \ldots, T). \tag{3}$$

Here

$$\alpha_{i,t} = \sum_{k=1}^{m_1} \theta_{i,k} D1_{i,t} + \sum_{k=1}^{m_1} \gamma_{i,k} D2_{i,t} + \alpha_{i,t-1} + u_{i,t},$$

$$\beta_{i,t} = \sum_{k=1}^{n_1} \varphi_{i,k} D1_{i,t} + \sum_{k=1}^{n_1} \gamma_{i,k} D2_{i,t} + \beta_{i,t-1} + \upsilon_{i,t}.$$

$D1$ and $D2$ are dummy variables, which can be defined as the following:

$$D1 = \begin{cases} 1, & t + T_B + 1 \\ 0, & \text{in other cases} \end{cases} \qquad D2 = \begin{cases} 1, & t > T_B + 1 \\ 0, & \text{in other cases.} \end{cases}$$

In this equation T_B expresses the structural break date and it allows n_1 structural breaks in the constant term and m_1 structural breaks in the trend. The test developed by Carrion-i-Silvestre *et al.* (2005) is arranged as to allow maximum 5 structural breaks. This test determines that the structural break dates are the minimizing points of the sum of squares of residuals (SSR). Bai and Perron (1998) have offered two different processes: the first one is based on the changed Schwarz information criterion (LWZ) developed by Liu, Wu and Zidek (1997) and the second one is based on the calculation of the F statistics consecutively in order to determine the structural break number. While determining the structural break number, Carrion-i-Silvestre *et al.* (2005) use the first process for the model with trend and the second process for the model with no trend. The hypotheses of the test are like below:

H_0: stationary;
H_1: no-stationary.

The calculated test statistics are compared with the estimated critical values by bootstrap. When the calculated test statistic is greater than its critical value, H_0 is rejected and it is decided that the series are non-stationary. Test statistics and critical values for individual countries and panel's overall have been calculated and the results were presented in Table 2.

Table 2

Panel unit root test results

	BOT			*ΔBOT*		*EXR*			*ΔEXR*	
	Test stat.	Critical value	Break date	Test stat.	Critical value	Test stat.	Critical value	Break date	Test stat.	Critical value
Bulgaria	0.178	0.022	1990;1993; 1997;2007	0.092*	0.220	0.260	0.098	1993;1996; 1999;2002;2008	0.051*	0.335
Hungary	0.045*	0.084	1992;1995	0.047*	0.101	0.857	0.151	1989;1994; 2000;2004;2008	0.051*	0.234
Poland	0.037*	0.042	1990;2000	0.126*	0.240	0.086*	0.568	1989;2000; 2008	0.066*	0.254
Romania	0.039*	0.049	1989	0.071*	0.131	0.067*	0.457	1994;1998; 2002;2008	0.114*	0.314
Turkey	0.090	0.051	1982;1988; 1993;2000;2008	0.107*	0.250	0.091*	0.402	1986;2000; 2003;2008	0.127*	0.310
Panel	4.392	4.224		7.192*	7.393	66.541	64.910		6.715*	26.348

Note: Critical values are for 10.000 samples with bootstrap; * shows 10% significance level. The model allowing the structural breaks in constant and trend has been chosen as a test model.

According to the results in Table 2, for the panel's overall, we can see that series are non--stationary in levels and they become stationary when their first difference is taken; in other words, they are I(1). In this case, it has been decided that the presence of cointegration relationship between these series can be tested. The test method has successfully determined the structural breaks.

3.5. The slope homogeneity test

It is a test for identifying whether the slope coefficients are homogeneous or not in the cointegration equation. The first studies on the subject have started with Swamy (1970). Pesaran and Yamagata (2008) have improved the Swamy test. A cointegration equation is like this:

$$Y_{it} = \alpha + \beta_i X_{it} + \epsilon_{it}. \tag{4}$$

This test controls whether β_i slope coeffients are different or not among the cross-sections. The hypotheses of the test are:

H_0: $\beta_i = \beta$ slope coefficients are homogeneous.

H_1: $\beta_i \neq \beta$ slope coefficients are not homogeneous.

The required test statistics are obtained by estimating the equation (4) with panel ordinary least squares (POLS) and then with weighted fixed effect model. Pesaran and Yamagata (2008) employed two different test statistics to test the hypotheses:

$$\text{for large samples: } \tilde{\Delta} = \sqrt{N}\left(\frac{N^{-1}\tilde{S} - k}{2k}\right) \sim \chi^2_k;$$

$$\text{for small samples: } \tilde{\Delta} = \sqrt{N}\left(\frac{N^{-1}\tilde{S} - k}{\upsilon(T,k)}\right) \sim N(0,1).$$

Here N indicates the number of cross-sections, S indicates Swamy test statistics, k indicates the number of explanatory variables, and $v(T, k)$ indicates the standard error. Homogeneity test results are given in Table 3.

Table 3

Slope homogeneity test

	Test statistics	Probability value
$\tilde{\Delta}$	1.072	0.142
$\tilde{\Delta}_{adj}$	1.124	0.130

Since the probability values of the tests in Table 3 are greater than 0.05, H_0 is accepted. It has been found that the slope coefficients are homogeneous in cointegration equation. So the cointegration comments for the panel's overall are valid and reliable, like in Pesaran and Yamagata (2008).

„Ekonomista" 2013, nr 2
http://www.ekonomista.info.pl

3.6. Panel cointegration test with multiple structural breaks

This test developed by Basher and Westerlund (2009) tests the existence of the cointegration relationship between the series I(1) which are non-stationary in levels in case of the cross-sectional dependence and multiple structural breaks. The test allows for the breaks in the constant term and trend. The test statistic is:

$$Z(M) = \frac{1}{N}\sum_{i=1}^{N}\sum_{j=1}^{M_i+1}\sum_{t=T_{ij-1}+1}^{T_{ij}} \frac{S_{it}^2}{(T_{ij} - T_{ij-1})^2 \hat{\sigma}_i^2}. \tag{5}$$

Here is $S_{it} = \sum_{s=T_{ij-1}+1}^{t} \hat{W}_{st}$. $\hat{W}_{st}$ is the regression residual obtained by using any efficient estimator of the cointegration vector such as the fully modified least squares (FMOLS) estimator. $\hat{\sigma}_i^2$ is the usual Newey and West (1994) long-run variance estimator based on $\hat{W}_{st}$). $Z(M)$ becomes the following when it is abbreviated by taking cross-sectional avarages:

$$Z(M) = \sum_{t=T_{ij-1}+1}^{T_{ij}} \frac{S_{it}^2}{(T_{ij} - T_{ij-1})^2 \hat{\sigma}_i^2} \sim N(0,1). \tag{6}$$

The test statistic shows the standard normal distribution. Hypotheses of the test are:

H_0: cointegration;

H_1: no cointegration.

When the probability value of the calculated test is greater than 0.05, H_0 is accepted and it is decided that there are cointegration relationship between the series. Cointegration test results were presented in Table 4.

Table 4

Panel cointegration test results

	Test statistics	Probability value	Decision	Break dates
When structural breaks are not considered	0.386	0.010	There is no cointegration relationship between the balance of trade and foreign exchange rate in some countries.	–
When structural breaks are considered	2.326	0.350	There is a cointegration relationship between the balance of trade and foreign exchange rate in all the countries in the panel.	Bulgaria: 1990; 1997; 2005 Hungary: 1992; 1998 Poland: 1990; 2000 Romania: 1989 Turkey: 1988; 1993; 2000

Note: Probability values are obtained with 1000 replication by using bootstrap. As a model; structural breaks in constant and trend model was selected.

Whether structural breaks are considered or not highly affects the decision about the presence of cointegration relationship. Here it is decided that there is a cointegration relationship between series in the panel when structural breaks and cross-sectional dependence are taken into consideration.

3.7. The estimation of long run cointegration coefficients

In this part of the study, after the cointegration relationship between the series has been determined, long run individual cointegration coefficients were estimated using CCE method which was developed by Pesaran (2006) and considering the cross-sectional dependence. In this analysis, structural break dates, obtained from the cointegration analysis, were been added to the analysis with dummy variables. CCE is an estimator that can generate results providing consistent and asymptotic normal distribution when the time dimension is both greater and smaller than the cross-section dimension and that can calculate the individual long run cointegration coefficients for all cross-sections (Pesaran, 2006). However, the long run cointegration coefficient of the panel has been calculated with CCEMG method, developed by Pesaran (2006) under the assumption that the long run cointegration coefficients are homogeneous. CCEMG estimates the long run cointegration coefficient by taking the arithmetical avarage of the values of the cross-sections. The results of the estimations have been done and results were presented in Table 5.

Table 5

Long run cointegration coeffients

Country	*EXR*	*t* statistics
Bulgaria	0.472	1.94^{**}
Hungary	0.026	1.85^{**}
Poland	0.008	0.30
Romania	0.033	1.06
Turkey	0.041	0.32
CCEMG	0.116	1.30^{*}

Note: *t* statistics calculated by using standard errors of Newey-West; * and ** shows 10% and 5% significances level respectively.

As can be seen in Table 5, increases in foreign exchange rates in all countries positively affect the balance of trade. However, this effect is statistically significant only for Bulgaria, Hungary and whole panel. So the Marshall-Lerner condition works for these countries.

3.8. Estimation of short run coefficients

At this stage of the analysis, short-run error correction model coefficients have been estimated with CCE method for cross-sections and with CCEMG for panel. In this analysis one period lagged error correction terms (ECT_{t-1}) series, and the differenced series were used. The results were presented in Table 6.

It can be seen that increases in foreign exchange rates in Hungary, Poland, Turkey and panel's overall and affect the balance of trade negatively in short run and J-curve phenomenon is valid in these countries. Also in all countries except Bulgaria coefficient of error correction terms are negative and statistically significant as expected. In other words, short run deviations converge to long run balance level.

Table 6

Short run coefficients

Country	ΔEXR	*t* statistics	ECT_{t-1}	*t* statistics
Bulgaria	0.041	1.242	–0.127	–0.547
Hungary	–0.035	–1.590**	–0.066	–1.404**
Poland	–0.177	–1.566**	–0.361	–2.694***
Romania	0.001	0.011	–0.281	–2.464***
Turkey	–0.316	–3.717***	–0.669	–4.104***
CCEMG	–0.097	–1.492**	–0.300	–2.857***

Note: *t* statistics calculated by using standard errors of Newey-West. *** and ** shows 1% and 5% significance level respectively.

4. Conclusion and evaluation

In this study, the relationship between the increases in foreign exchange rates and the balance of trade has been analyzed with panel data considering structural breaks and cross-sectional dependence by using 1980–2011 period data for the transition countries (Poland, Hungary, Bulgaria, Romania) and Turkey by testing for panel cointegration with multiple structural breaks.

The existence of cross-sectional dependence among the countries in the panel has been analyzed with $CDLM1_{adj}$ test and it has been determined that there is a cross-sectional dependence among these countries. It is thought that this dependence is due to the fact that most exports of these countries go to the European Union. Because there is cross-sectional dependence among the countries, a foreign exchange rate or balance of trade shock happening in one of these countries will affect the other countries. Countries should also take into consideration the events in other related countries.

The stationarity of the series has been analyzed with Carrion-i-Silvestre *et al.* (2005) test, which considers the multi-structural breaks and cross-sectional dependence in series. It has been observed that series are not stationary in levels and they become stationary in their first differences. So the existence of the cointegration relationship among the series can be searched.

The homogeneity of cointegration coeffients has been analyzed with the slope homegeneity test which was firstly claimed by Swamy (1970) and developed by Pesaran and Yamagata (2008). It has been found that the cointegration coefficients are homogeneous; in other words, the comments for the panel's overall are reliable.

The existence of the cointegration relationship between the series has been analyzed by panel cointegration with multiple structural breaks, the method developed by Westerlund (2009) considering the cross-sectional dependence and structural breaks in the cointegration equation. If structural breaks in series are not considered, there is no cointegration relationship, but there is cointegration relationship when structural breaks are considered.

The long run individual cointegration coefficients have been estimated with CCE method developed by Peseran (2006), which considers the cross-sectional dependence, and the long run panel's overall cointegration coefficients have been estimated with CCEMG.

It has been observed that increases in foreign exchange rates affect trade balance of the countries positively. It has been also shown that the Marshall-Lerner condition works for Bulgaria, Hungary and whole panel.

The short run cointegration coefficients have also been estimated with CCE and CCEMG methods and it has been found that *J*-curve is valid in Hungary, Poland, Romania, Turkey and whole panel.

To sum up, increases in foreign exchange rates in these countries are improve their balance of trade. Therefore, foreign exchange rates will be a political instrument in tehese countries in order to ensure trade balance.

Received on 15 October 2012.

References

Arize A.C., *Cointegration Test Of a Long- Run Relation Between The Real Exchange Rate And The Trade Balance*, "International Economic Journal" 1994, No. 8(3).

Baharumshah A.Z., *The Effect of Exchange Rate on Bilateral Trade Balance: New Evidence From Malaysia and Thailand*, "Asian Economic Journal" 2001, No. 15(3).

Bahmani-Oskooe M., Niroomand F., *Long-Run Price Elasticities and The Marshall-Lerner Condition Revisited*, "Economics Letters" 1998, No. 61(1).

Bahmani-Oskooe M., Kutan A.M., *The J-Curve In The Emerging Economies of The Eastern Europe*, "Applied Economics" 2009, No. 41(20).

Bai J., Perron P., *Estimating and Testing Linear Models with Multiple Structural Changes*, "Econometrica" 1998, No. 66(1).

Basher S.A., Westerlund J., *Panel Cointegration and the Monetary Exchange Rate Model*, "Economic Modelling" 2009, No. 26.

Beyaert A., Camacho M., *TAR Panel Unit Root Tests and Real Convergence: An Application to the EU Enlargement Process*, "Review of Development Economics" 2008, No. 12(3).

Breusch T.S., Pagan A.R., *The Lagrange Multiplier Test and Its Applications to Modelspecification Tests in Econometrics*, "Review of Economic Studies" 1980, No. 47(1).

Breitung J., *A Parametric Approach to the Estimation of Cointegrating Vectors in Panel Data*, "Econometric Reviews" 2005, No. 24(2).

Breuer B., Mcnown R., Wallace M., *Series-Specific Unit Root Test with Panel Data*, "Oxford Bulletin of Economics and Statistics" 2002, No. 64(5).

Carrion-i-Silvestre J.L., Barrio-Castro T. del, Lopez-Bazo E., *Breaking the Panels: An Application to the GDP Per Capita*, "Econometrics Journal" 2005, No. 8.

Charemza W.W., Deadman D.F., *New Directions in Econometric Practice: General to Specific Modelling, Cointegration and Vector Autoregression*, Second Edition, Edward Elgar Publishing, Chelthenham 1997.

Choi I., *Unit Roots Tests for Panel Data*, "Journal of International Money and Finance" 2001, No. 20.

Gianella Ch., Chanteloup C., *Assessing Russia's Non-fuel Trade Elasticities: Does the Russian Economy React "Normally" to Exchange Rate Movements?* "OECD Economics Department Working Papers" 2006, No. 510.

Guloglu B., Ispir M.S., *Is Natural Rate of Unemployment or Hysteresis? Sector-Specifc Panel Unit Root Test Analysis for Turkey*, "Ege Academic Review" 2011, No. 11(2).

Hadri K., *Testing for Stationarity in Heterogenous Panels*, "Econometrics Journal" 2000, No. 3.

Hsiao Y.M., Pan S.C., Wu P.C., *Does the Central Bank's Intervention Benefit Trade Balance? Empirical Evidence From China*, "International Review of Economics and Finance" 2012, No. 21.

Hook S.L., Boon H.T., *Reel Exchange Rate Volatility and Malaysian Export to Its Major Trading Partners*,, Universty Putra Malaysia "Working Paper" 2000, No. 6.

Im K., Pesaran H., Shin Y., *Testing for Unit Roots in Heterogenous Panels*, “Journal of Econometrics” 2003, No. 115(1).

Jamilov R., *J-Curve Dynamics and the Marshall-Lerner Condition: Evidence from Azerbaijan*, “MPRA Paper” 2011, No. 39272.

Lal A.K., Lowinger T.C., *Nominal Effective Exchange Rate and Trade Balance Adjustment in South Asia Countries*, “Journal of Asian Economics” 2002, No. 13(3).

Levin A., Lin. C.F., Chu C.S.J., *Unit Root Tests in Panel Data: Asymptotic and Finite Sample Properties*, “Journal of Econometrics” 2002, No. 108.

Liu J., Wu S., Zidek J.V., *On Segmented Multivariate Regressions*, “Statistica Sinica” 1997, No. 7.

Maddala G.S., Wu S., *A Comparative Study of Unit Root Tests with Panel Data and a New Simple Test*, “Oxford Bulletin of Economics and Statistics” 1999, No. 61.

Miles M.A., *The Effect of Devaulation and the Trade Balance of Payment: Some Result*, “Journal of Political Economy” 1979, No. 87(31).

Narayan R., *Currency Devaluatıon and Trade Balance: Policy Issue*, “Nepal Economic Perspectives” 2000, No. 18.

Narayan P.K., *New Zealand’s Trade Balance: Evidence of The J-Curve and Granger Causality*, “Applied Economics Letters” 2004, No. 11(6).

Newey W.K., West K.D., *Automatic Lag Selection in Covariance Matrix Estimation*, “Review of Economic Studies” 1994, No. 61(4).

Peker O., *Reel Döviz Kurunun Ticaret Dengesi Üzerindeki Etkileri: Türkiye Örneği*, “Atatürk Üniversitesi İktisadi ve İdari Bilimler Dergisi” 2008, No. 22(2).

Pesaran M.H., *General Diagnostic Tests for Cross-Section Dependence in Panels*, “Cambridge Working Papers in Economics” 2004, No. 435.

Peseran H., *Estimation and Inference in Large Heterogeneous Panels with a Multifactor Error Structure*, “Econometrica” 2006, No. 74(4).

Pesaran M.H., Ullah A., Yamagata T., *A Bias-Adjusted LM Test of Error Cross-Section Independence*, “Econometrics Journal” 2008, No. 11(1).

Pesaran M.H., Yamagata T., *Testing Slope Homogeneity in Large Panels*, “Journal of Econometrics” 2008, No. 142(1).

Singh T., *Testing J-Curve Hypothesis and Analysing the Effect of Exchange Rate Volatility on the Balance of Trade in India*, “Empirical Economics” 2004, No. 29(2).

Spitaller E., *Short Run Effect of Exchange Rate Changes on Run of Trade and Trade Balance*, “IMF Staff Paper” 1980, No .27(2).

Swamy P.A.V.B., *Effcient Inference in a Random Coeffcient Regression Model*, “Econometrica” 1970, No. 38(2).

Taylor M.P., *The Balance of Payments, New Perspectives on Open Economy Macroeconomies*, Edward Elgar Publishing, Hampshire 1990.

Taylor M., Sarno L., *The Behaviour of Real Exchange Rates During the Post-Bretton Woods Period*, “Journal of International Economics” 1998, No. 46.

Thirwall A.P., Gibson H.D., *Balance of Payments Theory and The United Kingdom Experience*, The Maculusalan Press, London 1986.

Wen L., *The Determinants of China’s Trade Balance*, International Conference on Business Computing and Global Informatization, Shangai 2011.