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THE VALIDITY OF BALASSA SAMUELSON HYPOTHESIS: DYNAMIC PANEL DATA METHODS TOWARD OECD COUNTRIES *

Professor Dr. Ahmet AY
Selcuk University, Faculty of Economics and Administrative Science, Konya/Turkey
Şevket Süreyya KODAZ
Selcuk University, Institute of Social Sciences, Phd. Konya/Turkey
Research Assistant Mustafa KARTAL
Selcuk University, Beyşehir Ali Akkanat Faculty of Business, mkartal@selcuk.edu.tr
(Corresponding author) Konya/Turkey

ABSTRACT

Balassa Samuelson Hypothesis, developed by Bela Balassa (1964) and Paul Samuelson (1964), points out effectiveness (productivity) difference in the sectors that are subject of trade or not as the reason for variations in exchange rate. According to this hypothesis, currency unit of the countries, where the difference of interest is high, will appreciate compared to the currency units of the other countries. Thus, Balassa Samuelson Hypothesis reveals the relationship between effectiveness, price, and real exchange rate.

In this study, the validity of Balassa Samuelson Hypothesis was tested in the scope of OECD countries. With moving from the dataset belonging to the period of 1971-2013, the results of carried out by using dynamic panel data methods point of that the hypothesis of interest are valid in Czech Republic, Finland, Germany, Hungary, Island, Japan, South Korea, Spain, United Kingdom, and Switzerland in the long period.

Keywords: Balassa Samuelson Hypothesis, Dynamic Panel Data Methods, Effectiveness, Price, Real Exchange Rate

1. INTRODUCTION

Among the targets that countries desire to realize from economic point of view, reducing current deficit, struggle with inflation and unemployment, lowering the debt burden of public, and increasing production take place. The main target underlying all of these is to provide stability in growth. For being able to realize these targets specified, some economic indicators have importance. For example, a variation to occur in local exchange rate can affect the export, import, domestic interest rates, debts tock, employment level, and national income of country. In view of this, real exchange rate is evaluated as an important indicator in terms of economic and political stability.

Many models were introduced toward determining exchange rates. One of these models is also purchasing power parity arguing that the goods, which are the subject of trade, should be processed through the same price all over the world. According to this approach, the variables determining real exchange rate are the amounts of the local and foreign currency paid for being able to purchase the goods concerned. Thıs, real exchange rate obtained by proportioning the currencies concerned are generally accepted as an indicator of competitive power of countries (Kibritçioğlu, 1996: 128). The hypothesis introduced by Balassa and Samuelson assumes that purchasing power parity is valid. But, according to this hypothesis, the productivity difference in countries leads variation in the real exchange rate. According the hypothesis of interest, deviations in purchasing power parity result from the productivity difference in the sectors that are or not the subject of trade and it was suggested that

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the fact that the productivity increase in the sectors that are the subject of trade are high would increase the real wages in the sectors concerned. On the other hand, while it was declared that this increase experienced in the real wages would also influence the sectors that are not the subject of trade, as a result of that productivity does not go with the increase in wages, it was stated that the prices of goods processed in these sectors would rise. It was concluded that the rise of domestic prices would made the country currency more worthless in the face of foreign currencies (Uslu, 2012: 15).

2. THEORETICAL FRAMEWORK

SGP is based on the assumption that the prices between countries can fluctuate in the short period but, in the long term, will range at the equilibrium level. According to the approach of interest, real currency is obtained by proportioning domestic prices with foreign prices. Therefore, it is presented that real exchange rates have a stable structure in the long period. But, later, that some variations are seen in the real exchange rate caused many studies to be carried out toward identifying the reasons for these variations. In the studies carried out by Balassa and Samuelson, the factors, which led real exchange rate to vary, are (Wagner, 2005: 5):

- ✓ that countries have the different productivities and growth rates
- ✓ the differentiations in market structures: capital movements, tariffs, and trade barriers
- ✓ structural change

The assumptions of Balassa and Samuelson hypothesis are summarized below in items (Uslu, 2012: 15; Ay and Üçgöz, 2008: 2).

- ✓ Adoption of liberalization principle in circulation of the factors of capital and labor
- ✓ As indicated in purchasing power parity, the validity of law of single price

According to the hypothesis of Balassa-Samuelson, the main reason for price differences between countries are the productivity differences in the sectors that are or not the subject of trade. That these sectors have the different productivity leads the prices to vary and, as a result of this, real exchange rate to vary as well. The approach concerned, a supply sided hypothesis, expresses that the productivity in the sectors that are subject of trade are higher than that in the sectors that are not subject of trade. Moreover, the price of goods and services in the sectors that are the subject of trade is determined in international prices. Thus, productivity increase to be able to occur in the sectors mentioned does not create any effect on the prices. But, in the sectors that are not the subject of trade, since wage increases are not followed by productivity increases, the upward movement of wages will directly cause the prices to rise. The price rise in the sectors of interest will lead to local exchange rate to revalue (Lopcu vd., 2011: 2).

3. LITERATURE

In the literature, there are many studies, in which Balassa-Samuelson hypothesis is tested. In this section of the study, the results obtained in the empirical studies are presented.

Halpern and Wyploz (2001), utilizing the data belonging to the period of 1991-1998, tested the relationship between exchange rate and productivity in Czech Republic, Hungary, Poland, Slovakia, Slovenia, Estonia, Greece, Portugal, and Spain by means of the method of panel analysis. Analysis results reveal that free exchange rate system is effective in the emergence of Balassa-Samuelson hypothesis. Egert et al. (2003) tested the validity of Balassa-Samuelson hypothesis in Croatia, Czech Republic, Estonia, Hungary, Livonia, Lithonia, Poland, Slovakia and Slovenia, considering the data belonging to the period of 1995-2000. In the study, as analysis method, fully modified ordinary least squares method was used and reached the restrictive findings toward the presence of Balassa-Samuelson hypothesis. Drine and Rault (2003), in their studies, took the period of 1960-1990 as reference. In the studies carried out by means of panel unit root and panel co-integration tests, specific to the countries dealt with, it was concluded that the hypothesis was valid.

Choundhri and Kahn (2004), in the study they carried out, dealt with the data of 16 countries belonging to the period of 1976-1994 and used dynamic ordinary least square method as analysis

technique. The results obtained support the assumptions that Balassa-Samuelson hypothesis put forward. Groen and Lomberdelli (2004), with the movement of quarter period data between the years of 1976-2002, tested the validity of Balassa-Samuelson hypothesis specific to United Kingdom and 6 countries. In the analyses, carried out by using the method of Johannsen Vector Autoregressive Method, it was stated that Balassa-Samuelson hypothesis was invalid among the countries concerned. Özçiçek (2006) dealt with the data belonging to the period of 1988:1-2004:3 and used Johannsen co-integration method in the analyses. The findings show that Balassa-Samuelson hypothesis is valid between Turkey and Germany. Yıldırım (2007), in his study, tested the validity of the hypothesis for Turkey, US, Germany, France and United Kingdom. According to the results obtained, while the hypothesis concerned is valid between Turkey and US and Germany, it is not valid between Turkey and France and United Kingdom.

Chowdury (2007) tested the validity of hypothesis toward the Australian and US economies by using the method of Auto Regressive Distributed Lags (ARDL) Model with moving from the data of 19750-2003. The findings show that Balassa-Samuelson hypothesis was valid between two countries. Ay and Üçgöz (2008) tested Balassa-Samuelson hypothesis by being based on the period of 1970-2004 and using time series approach specific to Turkey and US. Analysis results point out that Balassa-Samuelson hypothesis is not valid in the long period. Genius and Tzouvelekas (2008), by means of panel data analysis, attempted to account for the validity of Balassa-Samuelson hypothesis with moving from the data of 1965-1992 for 50 countries. Analysis results point out that the hypothesis is valid for all countries. Jaunky (2008) dealt with 9 countries as sample and the period of 1970-1994 as dataset. In the analyses carried out by means of panel co-integration method, the results supporting the validity of hypothesis were obtained.

Dimutru and Jianu (2009) tested the validity of Balassa-Samuelson hypothesis with moving from the different price indices. In the study, in which the data belonging to the period 1988-2006 are used, they revealed that the effect of Balassa-Samuelson hypothesis was 0.6%, when CPI is used, and when the different indicators are used, that it was 2.6%. Guo (2010), in his study toward Chinese and US economy, reached the results regarding the validity of the assumptions that the hypothesis puts forward. While Dedu and Dumitrescu (2011) and Camarero and Ordonez (2011), in the studies they carried out, reached the results supporting the hypothesis of interest, the results Lopcu et al. (2011), Petrovic (2012), and Altunöz (2014) found do not overlap with the assumptions put forward by the hypothesis.

4. DATA, MODEL AND FINDINGS

In this study, Balassa-Samuelson Hypothesis (the effect of transnational price differences on exchange rate) has been tested for OECD countries in the scope of the period 1971-2013 using dynamic panel data methods (average group predictor methods pooled by panel unit root and co-integration tests).

4.1. Definition of Data and Variables

The variables used in testing Balassa-Samuelson Hypothesis take place in Table 1. In the study, exchange rate was taken as dependable variable and Gross Domestic Product (GDP) and Consumer Prices Index (CPI) as independent variables. In forming theoretical framework and establishing model, the studies of Miletic (2012), Dedu and Dumitrescu (2010) and Jazbec (2002) were utilized.Table captions appear centered above the table in upper and lower case letters. When referring to a table in the text, no abbreviation is used and "Table" is capitalized.

Table 1: Dataset

Variables	Definition of Variables
Exchange Rate (in national currency per USD)	Exchange rate was calculated in national currency per USD. It expresses the value of national currency in Dollar

GDP (Current Purchasing Power Parity, OECD=100, million dollar per capita)	GDP is defined as the total value of the final goods and services, produced in a country borders by either the citizens of that country or the other country for a certain period. In calculating GDP, three different techniques are used as the methods of expenditures, income, and production. GDP is accepted as the most important indicator of economic growth in the economic literature.
Consumer Price Index	It is average variation in the prices of goods and services purchased by households
D (dummy /artificial variable)	This artificial variable takes the value "1" for 1973 and 2000, crisis years, and the value "0" for the other years

Resource: OECD, OECDstats, Data Bytheme, http://stats.oecd.org/ 01.02.2015.

4.2. Model and Method

In the study, in OECD countries, in the scope of Balassa-Samuelson Hypothesis, in the estimation of the long and short term relationships of exchange rate, inflation, and economic growth, the estimators of PMG and MG will be utilized. While testing the relationships concerned between these variables, in order to identify which estimator gives better result, long term homogeneity will be tested by Hausman test.

In the studies, in identifying the stationarity of series, Levin, Lin&Chu (LLC), Im, Pesaran-Shin (IPS) and PhillipsPerron (PP) tests were used.

First-degree panel data model with autoregressive component:

$$y_{it} = p_i y_{i,t-1} + z'_{it}\Upsilon_i + \epsilon_{it} \qquad (1)$$

Panel unit root tests use the hypothesis $H_0: p_i = 1$ against alternative hypothesis $H_a: p_i < 1$. Equation (1) is generally written as:

$$\Delta y_{it} = \emptyset_i y_{i,t-1} + z'_{it}\Upsilon_i + \epsilon_{it} \qquad (2)$$

In view of this, alternative hypothesis of all I becomes $H_a: \emptyset_i < 0$ and null hypothesis $H_0: \emptyset_i = 0$

LIC test works in Equation (2) under the constraint that all parameters share a common autoregressive parameters. In a regression model just as in Equation (1), ϵ_{it}s are punished by serial correlation. At the point of cope with this problem, LLC test uses the additional laggings of the dependable variable.

LIC test 2

$$\Delta y_{it} = \emptyset_i y_{i,t-1} + z'_{it}\Upsilon_i + \sum_{j=1}^{p_i} \theta_{ij}\, \Delta y_{it-j} + u_{it} \qquad (3)$$

Im-Pesaran-Shin (2003), with unit root test he developed, made flexible the assumption that there is a common autoregressive. It is more likely that this situation emerges in the empirical studies. IPS test uses Dickey Fuller test, calculated for each panel unit (In LIC test, it is calculated for all units). While H_0 hypothesis remains unchanged, alternative hypothesis works for some part of panels that is stationary in all panel units.

IPS test can be mathematically expressed as follows:

$$\Delta y_{it} = \emptyset_i y_{i,t-1} + z'_{it}\Upsilon_i + \epsilon_{it} \qquad (4)$$

In this test, $\emptyset_i$s are specific to panel, it is constant in LLC test. IPS test assumes that ϵ_{it}s are independently distributed from all of "i"s and "t"s (StataCorp, 2012: 534-536; Zdarek, 2011: 19)

Phillips-Perron (1988), in regression equation of unit root test, rejects serial correlation. Regression equation in PP unit root test is:

$$\Delta y_{it} = \alpha + p y_{i-1} + \epsilon_i$$

In the equation ϵ_i (i.e error term) can be varying variance and autocorrelation. About coping with these problems, two statistics are calculated; Z_p and Z_r.

$$Z_p = n(\hat{p}_n - 1) - \frac{1}{2}\frac{n^2\hat{\sigma}^2}{s_n^2}(\hat{\lambda}_n^2 - \hat{\omega}_{0,n})$$

$$Z_r = \sqrt{\frac{\hat{\omega}_{0,n}}{\hat{\lambda}_n^2}}\frac{\hat{p}_n - 1}{\hat{\sigma}} - \frac{1}{2}(\hat{\lambda}_n^2 - \hat{\omega}_{0,n})\frac{1}{\hat{\lambda}_n}\frac{n\hat{\sigma}}{s_n}$$

$$\hat{\omega}_{j,n} = \frac{1}{n}\sum_{i=j+1}^{n}\hat{u}_i\,\hat{u}_{i-j}$$

$$\hat{\lambda}_n^2 = \hat{\omega}_{0,n} + 2\sum_{j=1}^{q}(1 - \frac{j}{q+1})\hat{\omega}_{j,n}$$

$$s_n^2 = \frac{1}{n-k}\sum_{i=1}^{n}\hat{u}_i^2$$

In the equations, u_i OLS denotes wastes; k; covariance numbers in regression; q, Newey-West, used in calculating $\hat{\lambda}_n^2$; and $\hat{\sigma}$, OLS standard error of $\hat{p}$. (http://staff.bath.ac.uk/hssjrh/Phillips%20Perron.pdf Access date: 03.02.2015).

The presence of long term relationship between series i.e. co-integration analyses were studied by using Pedroni (2001) and Kao (1999) tests.

The wastes based co-integration equation, developed and estimated by Pedroni (2001), can be expressed as follows:

$$e_{it} = p_i e_{it} + \sum_{j=1}^{p_i}\psi_{ij}\,\Delta e_{it-1} + v_{it}$$

The equation of Kao (1999) co-integration test, based on homogenous variance of innovation process ε_{it} and stationary wastes, is (Caporale and Škare, 2011: 7):

$$\hat{\varepsilon}_{it} = p_i\hat{\varepsilon}_{it-1} + \sum_{j=1}^{p_i}\omega_{ij}\,\Delta\hat{\varepsilon}_{it-j} + v_{it}$$

While Pooled Mean Group Estimator (PMGE), developed by Shin and Smith (1999), allows for the differentiation of short term dynamics among countries, long term relationships are constrained in such way that they will be homogenous. PMG estimator is based on short term heterogeneous dynamics and Autoregressive Distributed Lag (ARDL).

$$\Delta(\tilde{m}_{it} - \tilde{p}_{it}) = \emptyset_i(\tilde{m}_{it-1} - \tilde{p}_{it-1}) + a_1\tilde{y}_{it} + a_2\tilde{r}_{it} + \sum_{j=1}^{p-1}\lambda_{ij}\,\Delta(\tilde{m}_{it-j} - \tilde{p}_{it-j} +)\sum_{j=0}^{q-1}(\delta_{ij1}\,\Delta\tilde{y}_{it-j} + \sum_{j=0}^{q-1}(\theta_{ij1}\,\Delta\tilde{y}_{it-j}) + \mu_i + \varepsilon_{it}$$

In the model, $\emptyset_i$ denotes error denotes correction parameter;, λ_{ij}, the coefficients of dependable variable (scalars); $\delta_{i,j}(k \times 1)$, coefficient vectors; index i, the number of country; t, time; q, optimum lagging length; and u_{it}, the term error. That error correction parameter is negative valued and

statistically significant indicates that short term deviations between co-integrated series will disappear in long term and that series will reach equilibrium in the long period (Nautz and Rondorf, 2010: 13).

PMG estimator is an estimator between Dynamic Fixed Effects Estimator (DFE), based on the homogeneity assumption for all parameters except for fixed effects, and Mean Group Estimator (MGE), based on the heterogeneity of all parameters and suggested by Pesaran (1995). In order to be able to make a chose between PMG and MGE, in other words, to test long term homogeneity, Hausman test (1978) is used (Aghion et al., 2007: 21).

In the study, panel vector error correction model, used in the analysis of long and short term relationships, can be formulated as follows.

$$\Delta RER = \emptyset_i \varepsilon_{it-1} + \beta'_{i1} CPI + \beta'_{i2} GDP_{it} + \sum_{j=1}^{p-1} \lambda_{ij1} \Delta RER_{it-1} + \sum_{j=0}^{q-1} \delta_{ij1} \Delta CPI_{it-j} + \sum_{j=0}^{q-1} \delta_{ij1} \Delta GDP_{it-j} + u_{it}$$

4.3. Findings

In this study, in which Balassa-Samuelson Hypothesis was tested in OECD countries, with moving from the data belonging to the period 1971-2013, analyses were carried out by using dynamic panel data method.

Table 2: Panel Unit Root Tests

Unit Root Test	Levin, Lin & Chu				Im, Pesaran and Shin W-stat				Phillips Perron			
Variable	With Constant		With Constant and Trend		With Constant		With Constant and trend		With Constant		With Constant and Trend	
	Stats.	Prob.	Stats.	Prob.	Stats.	Prob.	Stats.	Prob.	Stats.	Prob.	Stats	Prob.
RER	-2.95*	0.001	-0.39	0.345	-3.72*	0.000	-2.72	0.003	95.5*	0.010	56.7	0.785
CPI	-5.94*	0.000	-3.46*	0.000	1.67	0.952	0.87	0.808	77.9	0.148	35.6	0.999
GDP	-0.11	0.452	0.35	0.637	2.06	0.980	-0.19	0.421	51.1	0.910	49.3	0.937
FIRST DIFFERENCES												
RER	-24.18	0.000	-22.2	0.000	-20.7	0.000	-18.07	0.000	515.4	0.000	424.2	0.000
CPI	-7.95	0.000	-8.48	0.000	-9.12	0.000	-7.6	0.000	201.5	0.000	164.3	0.000
GDP	-22.4	0.000	-20.2	0.000	-21.5	0.000	-19.3	0.000	552.0	0.000	495.08	0.000

* There is no unit root

While the values of LLC are t-statistics values, the values of the other tests are the Chi-Square values.

In the selection of lagging length, Schwarz information criterion was considered.

That the series to be used in economic analyses is stationary has a considerable importance at preventing point a probable dummy relationship between the variables from appearing. In this scope, in the study, in testing stationarity of variables, the tests of Levin, Lin&Chu (LLC), Im, Pesaran-Shin (IPS) and Phillips Perron (PP). The results of tests are given in Table 2. According to this, it was seen that the series used in the study were not stationary at their original levels (RER variable, persistence of the LLC, IPS ve PP tests. CPI variable increased fixed and steady trend of LLC test. Due to the fact that the variable RER did not turn out stationary in the case with constant and trend (in this case,

an apparent relationship can emerge), it was deemed suitable to take the difference of this series as in the other series. In this scope, all series were made stationary by taking their first differences.

Between the series made stationary by taking their first differences, the presence of long term relationship were studied by using co-integration tests (Pedroni and Kao tests). As will be seen in Table 3, in either in the cases with constant or with constant and trend, there is a co-integration between series according to six out of seven Pedroni co-integration tests and Kao test only carried out in the case with constant.

Table 3: Panel Co-integration (Pedroni and KAO) Tests

The cases with constant and with constant and trend	**With constant**		**With constant and trend**	
Statistics	**Statistic**	**Probability**	**Statistics**	**Probability**
Panel v-statistics	-3.833802	0.9999	-7.263159	1.0000
Panel rho- statistics	-13.77024	0.0000	-9.308101	0.0000
Panel PP- statistics	-16.57095	0.0000	-17.44016	0.0000
Panel ADF- Statistics	-17.22932	0.0000	-18.23047	0.0000
	Statistics	**Probability**	**Statistics**	**Probability**
Group rho- Statistics	-11.17544	0.0000	-6.668319	0.0000
Group PP- Statistics	-18.97332	0.0000	-18.42897	0.0000
Group ADF- Statistics	-19.08551	0.0000	-18.17183	0.0000
KAO Test	2.501859	0.0062	-	-

* In the selection of lagging length, Schwarz information criterion was considered.

After identifying a long term relationship between the series, it is possible to calculate the direction and coefficients of long and short term relationships in the framework of Vector Error Correction Model, using PMG and MG estimators.

The relationship between RER, CPI and GDP was tested by both PMGE and MGE estimators. In order to identify which of these estimators gives the effective results, Hausman test (long term homogeneity test) was carried out and, as seen in Table 4, where test results take place, the value chi-square did not turn out significant and H0 hypothesis was not rejected. Hence, PMG estimator produce more accurate results and long term parameters are homogenous. In other words, error correction parameter (Short Run error correction-SRec) is significant-that this parameters is smaller than zero shows that it is significant-and there are long term relationship between two variables. Error correction parameter also shows that the short term deviations, resulted from that the data are not stationary, affect the pace of short term deviations to reach equilibrium in the long term.

Table 4: PMGE and Hausman Test Results

D.RER	**COEFFICIENT**	**STANDARD DEVIATION**	**Z STATISTICS**	**P > | Z|**	**%95 CONFIDENCE INTERVAL**	
Ec CPI	.3249243	.0579844	5.60	0.000	.2112769	.4385717
Ec GDP	-1.464898	.2331665	-6.28	0.000	-1.921896	-1.007901
Ec D	-8.810068	4.920744	-1.79*	0.073	-18.45455	.8344123
SR Ec	-.0307746	.0127822	-2.41	0.016	-.0558272	-.005722
CPI D1.	1.361347	.7464698	1.82*	0.068	-.1017067	2.824401
GDP D1.	-1.129673	.9421814	-1.20**	0.231	-2.976315	.7169687
D D1.	-3.313812	1.725379	-1.92*	0.055	-6.695493	.0678692
Constant	8.212929	3.450777	2.38	0.017	1.44953	14.97633
Hausman Test: chi2(1) = 2.30, **Prob>chi2** =0.5123 **Log Probability:** -186.5357 **Number of observation:** 1204.						

* Coefficient was accepted significant at the level of 10%.**: Coefficient is insignificant.

In accordance with this situation, about 3% of unbalances forming in a period will get better in the next period and it will be enabled it to approach long term equilibrium. However, while both short (1.36) and long (0.32) term parameters of the variable CPI are significant, only long term parameter

(1.46) of the variable GDP. On the other hand, in order to reflect the effect of crises, either short (-3.31) and long term (-8.81) error parameter of the dummy variable (D) included in the model is significant.

In the long period, 1% increase, which will occur in CPI, will raise exchange rate by 0.32% in long term and 1.36% in long term. GDP will reduce the exchange rate in the rate of 1.46% in long period. The findings generally overlap with the economic expectations in the direction of that price differentiations will raise exchange rate and that product level rises, exchange rate will fall.

In Table 5, the results belonging to the effects of long term unit take place. In terms of unit effects, the coefficients belonging to the error correction parameters of Czech Republic, Finland, Germany, Hungary, Ireland, Japan, South Korea, Spain, United Kingdom, and Switzerland are significant. In view of this, in the countries of interest, there is a long term relationship between exchange rate, consumer prices index and GDP.

Table 5: Long Term Unit Effects on the Countries

Countries/ Variables/ Statistics	ec (error correction coefficient)			CPI D1.			GDP D1.			D D1.			Constant		
	Coefficient	(z) Stat.	Prob.	Coefficient	(z) Stat.	Prob.	Coefficient	(z) Ist	Prob.	Coefficient	(z) Stat	Prob.	Coefficient	(z) Stat	prob.
Australia	.0002	0.22	0.824	.002	0.14	0.888	-.0007	-0.10	0.921	-.053	-0.88	0.378	-.045	-0.23	0.817
Austria	-.002	-1.06	0.290	.059	2.32	0.020	-.012	-1.28	0.201	-.104	-1.76	0.079	.297	0.75	0.454
Belgium	-.002	-1.18	0.237	.064	3.50	0.000	.002	0.24	0.813	-.061	-1.09	0.278	.137	0.61	0.540
Canada	.001	2.09	0.037	-.029	-2.34	0.019	-.005	-0.75	0.454	.001	0.04	0.968	-.151	-1.71	0.087
Chili	-.071	.047	0.136	4.51	1.01	0.311	-11.96	-3.62	0.000	-51.68	-1.98	0.048	44.65	1.28	0.201
Czech Repub.	-.209	-2.15	0.032	.561	2.75	0.006	-.394	-1.60	0.110	-3.42	-2.53	0.011	20.14	1.83	0.067
Denmark	-.017*	-1.77	0.076	.4450	3.65	0.000	.0427	0.91	0.361	-.452	-1.39	0.163	1.690	1.18	0.238
Estonia	-.003	-1.21	0.225	.021	0.90	0.370	-.015	-1.54	0.124	-.033	-0.28	0.782	.119	1.11	0.267
Finland	-.003	-1.70	0.090	.033	2.35	0.019	-.006	-1.11	0.266	-.021	-0.45	0.650	.379	1.57	0.117
France	-.002	-1.17	0.242	.047	2.91	0.004	.0107	0.96	0.335	-.025	-0.49	0.627	.142	0.76	0.447
Germany	-.004	-2.08	0.038	.074	3.17	0.002	-.022	-2.00	0.045	-.036	-0.63	0.529	.445	1.67	0.094
Greece	.0001	0.26	0.796	.004	0.63	0.530	-.003	-0.95	0.344	.006	0.17	0.867	-.012	-0.16	0.869
Hungary	-.174	-2.39	0.017	5.82	2.29	0.022	2.47	0.86	0.391	-24.19	-2.08	0.038	21.43	0.99	0.322
Island	-.253	-3.49	0.000	3.10	6.88	0.000	.337	1.32	0.185	-6.95	-1.65	0.100	51.47	2.61	0.009
Ireland	-.0002	-0.44	0.663	.012	1.06	0.291	-.0004	-0.08	0.937	-.0537	-0.55	0.582	.008	0.09	0.927
Israel	.0092	2.40	0.016	.0375	1.57	0.117	-.008	0.54	0.586	-.464	-3.54	0.000	-1.04	-2.92	0.003
Italy	.001	0.95	0.341	0183	1.26	0.206	-.007	-0.92	0.358	-.013	-0.29	0.771	-.175	-1.22	0.222
japan	-.229	-5.02	0.000	5.99	3.95	0.000	1.41	1.06	0.288	-8.65	-1.14	0.255	51.10	3.99	0.000
Korea	-.082	-2.13	0.033	23.44	2.30	0.021	-28.78	-4.04	0.000	-10.60	-0.28	0.778	81.69	1.79	0.074
Luxemburg	.0001	0.26	0.791	.070	4.36	0.000	-.0007	-0.29	0.771	-.053	-1.03	0.303	-.178	-1.53	0.125
Mexico	.017	1.51	0.132	.193	3.80	0.000	-.152	-2.76	0.006	-.581	-2.20	0.028	-1.19	-1.61	0.108
Netherland	-.006	-2.36	0.019	.073	3.31	0.001	.006	0.77	0.441	-.017	-0.32	0.745	.700	2.13	0.033
New Zeeland	.001	1.11	0.268	-.006	-0.35	0.729	.0008	0.08	0.936	-.073	-0.81	0.417	-.137	-0.93	0.353
Norway	-.0006	-0.23	0.820	.134	1.58	0.113	.020	1.22	0.223	-.564	-2.03	0.042	-.236	-0.42	0.672
Poland	.011	1.40	0.162	.086	5.21	0.000	-.042	-0.85	0.393	-.620	-4.16	0.000	-.744	-2.09	0.037
Portugal	.002	1.02	0.310	.002	0.21	0.832	-.009	-1.23	0.217	-.005	-0.14	0.891	-.199	-0.91	0.365
Slovak Repub.	-.002	-0.82	0.412	-.022	-1.17	0.243	-.046	-2.60	0.009	.111	1.13	0.257	.283	1.27	0.204
Slovenia	-.003	-1.08	0.278	.032	2.42	0.015	-.026	-2.14	0.032	.055	0.91	0.362	.244	0.81	0.421
Spain	-.00001	-0.01	0.995	.004	0.21	0.832	-.011	-1.40	0.162	-.034	-0.67	0.503	.003	0.01	0.988

Sweden	-.003	-0.41	0.679	.046	0.64	0.519	-.075	-1.73	0.084	-.465	-1.35	0.177	.333	0.33	0.740
Switzerland	-.003	-2.64	0.008	.055	2.06	0.039	.015	1.72	0.086	-.132	-1.41	0.159	.509	2.41	0.016
Turkey	.012	3.41	0.001	.039	7.20	0.000	-.017	-2.40	0.017	-.133	-2.83	0.005	-.648	-3.75	0.000
United Kingdom	-.00006	-0.05	0.958	.004	0.39	0.699	.0004	0.06	0.955	-.025	-0.75	0.454	.003	0.02	0.985

*: Coefficient was accepted significant at the level of 10%.

5. CONCLUSION

While Balassa-Samuelson hypothesis reveals that fluctuations in real exchange are permanent, it is stated that this case results from the production difference in the sectors that are and not the subject of trade. Here, as sector that are the subject of trade, the sectors that are open to the foreign trade are mentioned. On the other hand, the goods and services in the sectors that are not the subject of trade i.e that are close to foreign trade, goods and services can only be traded within the borders of country. According to the hypothesis concerned, the productivity increase in the sectors that are open to foreign trade prevents the prices from rising too much. Beside this, that the productivity does not go with productivity can drag economy into an inflationist process.

In this study, in the scope of OECD countries, whether or not the hypothesis is valid was tested. While the findings obtained reveal that international price differences will raise the exchange rate, in addition, in the study, it was concluded that national income and exchange rate move in the opposite direction. These results identified generally overlap with the economic expectations. On the other hand, whether or not the coefficients belonging to error correction parameters are significant are tested specific to the country sample, analysis results point out that the hypothesis concerned is valid in long term in Czech Republic, Finland, Germany, Hungary, Island, Japan, South Korea, Spain, United Kingdom, and Switzerland. These findings obtained point out that in the countries of interest, there is a long term relationship between exchange rate, CPI and GDP.

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