An Analysis of Purchasing Power Parity and The Affecting Factors

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**A B S T R A C T**

This study was conducted through the use of the Turkish Statistical Institute (TUIK) 2012-2014 statistical data. As purchasing power parity (PPP), the rates of items of goods and services in different countries were defined and analyzed. The research was enriched by correlation analysis, Granger causality test and regression analysis through the use of the E-Views 8.0 software. According to the 2014 results, the average of GDP indices for Turkey was determined to be 53 when the average of GDP indices for 28 member countries of the European Union was 100. Besides, actual individual consumption levels were found to be highly related in the same direction, and the GDP indices of the countries were highly related with the price indices in the same direction. In terms of price levels, a strong relation was detected between the indices of individual countries. Causality was found between actual individual consumption and GDP, and between actual individual consumption and GDP price levels. It was determined that a one-unit increase in actual individual consumption increased GDP by 1.10 units, and a one-unit increase in price level index increased GDP by 1.06 units. In general, with an average of 47%, Turkey lags behind the 28 EU member countries. Besides, it has a parallelism with 3 countries of the European Free Trade Association (EFTA), Switzerland, Iceland and Norway and 5 EU candidate countries, Macedonia, Montenegro, Serbia and Albania. On the other hand, Turkey has been in a quite good position in terms of individual purchasing power in 2014 and 2015, compared to Greece, one of the EU member countries.

**I N T R O D U C T I O N**

National economies have a significant effect on the averages of individual purchasing power and countries’ purchasing power. Purchasing power seems to be high for developed and developing countries while there is an opposite situation in medium and low income countries with low personal income level. Besides, factors such as external dependence, import and export also constitute a different factor on purchasing power. If the purchasing power is to be examined under two different titles, service and goods would be the appropriate ones. The relation between exchange rates and economic activities should not be ignored since the imported products are indexed to foreign exchanges and this causes important effects on purchasing power. If the exchange rate is flexible or if it is high according to the currency value of the country, then purchasing level decreases and parity is negatively affected.

**Literature review:**

The factor that affects the purchasing power parity to the highest degree is exchange rate (14). Besides, in the trade relations between the countries, elasticity of exchange rate or the exchange policies cause a different effect on purchasing power parity [13]. A review of some studies on purchasing power parity shows that panel data analysis method is used in most of these studies [1]. According to the 2014 data, the purchasing power parity of Turkey lagged behind that of 28 EU member countries by a rate of 47%. This shows that the purchasing power of Turkey decreased compared to the EU countries and a difference occurred on the basis of personal income [16]. In terms of macroeconomic variables and political practices, it is seen that the most important factors affecting the purchasing power parity are public debt, inflation, stability and growth [4-5].

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Factors such as exchange rate movements, monetary policies and actual payment balance are also important factors which affect purchasing power parity [8]. Fixed exchange rate, balance of payments and monetary approach policies affect purchasing power parity positively. Besides, improvement in individual income and the level of income per capita are also important causes of effect [2]. According to Hooper and Marquez (1995), differentiation of income level affects personal expenditure parity and it also results in an important impact on the movement of money within a country [10-7]. Personal abilities, education, experience and some other causes affect purchasing tendencies, and they also cause differences in expenditures [12-9]. Some personal characteristics change the purchasing tendencies and they also cause effects on purchasing power parity [3]. Factors such as personal income, actual payments in production factors, interest, profit, rental income, personal standard expenses, health expenditures, direct and indirect taxes and level of household income also affect purchasing power parity [15]. Generally speaking, personal or institutional expenditures are related with balance of income and expenditures. In this respect, national economy, level of household income, personal expectations and expenditures, and standard expenses are the most important factors that affect purchasing power parity [11]. Income differences, activity of the national economy and the monetary policies also affect purchasing power parity, and they also cause differences in the levels of personal expectation. Economic power has an effect on the level of personal expenditures, and it can be also defined as a factor affecting purchasing power parity [6]. Factors such as price elasticity, easy accessibility to the product and the use of technology affect purchasing behaviors, and they can be regarded as a variable of parity. Considering the tendencies towards personal development and technological products in Turkey, the high consumption of imported products – i.e. consumption of exchange-based products – and high demand for foreign products are among the salient facts. And this situation affects purchasing power parity.

**Purpose:**
This study was conducted on the basis of TUIK-Press Release / Purchasing Power Parity. Variables were determined for the period between 2012 and 2014.

**Data Analysis:**
Data acquired from this study were analyzed through the E-Views 8.0 software. Factors with biggest effects on purchasing power parity were determined through regression and correlation analyses. Panel data analysis method was used in the analysis of the data.

**Hypotheses of the Study:**
✓ H0: There is no relation among the variables.
✓ H0: There is no causality between GDP and price indices, and between GDP and price levels.
✓ H0: There is no causality between the variables of GDP and actual individual consumption.
✓ H0: There is no relation between GDP indices and price level indices.

**Implementation and Analyses:**
**Abbreviations of the Variables:**
- GDP: Gross domestic product
- AIC: Actual individual consumption
- PLI: Price level index

**Correlation Analysis:**
H0: There is no relation among the variables.
Results of the correlation analysis are provided below:
- GDP indices of the countries have a high level of relation with actual individual consumption indices in the same direction.
- GDP indices of the countries have a high level of relation with price level indices in the same direction.
- Actual individual consumption indices of the countries have a high level of relation with price levels indices in the same direction.

**Table 1: Pearson correlation**

<table>
<thead>
<tr>
<th></th>
<th>GDP</th>
<th>AIC</th>
<th>PLI</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP</td>
<td>-</td>
<td>0.903963</td>
<td>0.875030</td>
</tr>
<tr>
<td>AIC</td>
<td>0.903963</td>
<td>-</td>
<td>0.930566</td>
</tr>
<tr>
<td>PLI</td>
<td>0.875030</td>
<td>0.930566</td>
<td>-</td>
</tr>
</tbody>
</table>

**Granger Causality Test:**
H0: There is no causality between GDP and price indices, and between GDP and price levels.
As for the causality relations among the variables, it was determined that some prob values were smaller than 0.05 and that the hypothesis H0 was needed to be rejected. Therefore, there is no relation of causality among the statistics.

- There is a relation of causality between actual individual consumption and GDP.
- There is a relation of causality between price level indices and GDP.

### Table 2: Granger causality analysis

<table>
<thead>
<tr>
<th>Null Hypothesis</th>
<th>Obs</th>
<th>F-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIC does not Granger Cause GDP</td>
<td>38</td>
<td>5.17192</td>
<td>0.0111</td>
</tr>
<tr>
<td>GDP does not Granger Cause AIC</td>
<td></td>
<td>2.62348</td>
<td>0.0876</td>
</tr>
<tr>
<td>PLI does not Granger Cause GDP</td>
<td>38</td>
<td>14.0899</td>
<td>4.0E-05</td>
</tr>
<tr>
<td>GDP does not Granger Cause PLI</td>
<td></td>
<td>6.41839</td>
<td>0.0644</td>
</tr>
<tr>
<td>PLI does not Granger Cause AIC</td>
<td>38</td>
<td>0.96900</td>
<td>0.3900</td>
</tr>
<tr>
<td>AIC does not Granger Cause PLI</td>
<td></td>
<td>0.28044</td>
<td>0.7572</td>
</tr>
</tbody>
</table>

### Regression Analysis:

**H0:** There is no relation between the variables of GDP and actual individual consumption.

Following results were obtained from the regression analysis of GDP and actual individual consumption together:

- A one-unit increase in actual individual consumption increases GDP by 1.10 units.

### Table 3: GDP x AIC regression analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIC</td>
<td>1.109162</td>
<td>0.022438</td>
<td>49.4334</td>
<td>0.0000</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.775410</td>
<td>Mean dependent yes</td>
<td>92.64912</td>
<td></td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.775410</td>
<td>S.D. dependent yes</td>
<td>46.06267</td>
<td></td>
</tr>
<tr>
<td>S.E. of regression</td>
<td>21.82954</td>
<td>Akaike info criterion</td>
<td>9.013139</td>
<td></td>
</tr>
<tr>
<td>Sum squared resid</td>
<td>53847.76</td>
<td>Schwarz criterion</td>
<td>9.037140</td>
<td></td>
</tr>
<tr>
<td>Log likelihood</td>
<td>-512.7489</td>
<td>Hannan-Quinn criter.</td>
<td>9.022880</td>
<td></td>
</tr>
<tr>
<td>Durbin-Watson stat</td>
<td>0.006575</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**H0:** There is no relation between the variables of GDP and price level indices.

Following results were obtained from the regression analysis of GDP and price level indices together:

- A one-unit increase in price level indices increases GDP by 1.06 units.

### Table 4: GDP x PLI regression analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLI</td>
<td>1.063217</td>
<td>0.022375</td>
<td>47.51800</td>
<td>0.0000</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.757820</td>
<td>Mean dependent yes</td>
<td>92.64912</td>
<td></td>
</tr>
<tr>
<td>Adjusted R-squared</td>
<td>0.757820</td>
<td>S.D. dependent yes</td>
<td>46.06267</td>
<td></td>
</tr>
<tr>
<td>S.E. of regression</td>
<td>22.66828</td>
<td>Akaike info criterion</td>
<td>9.088544</td>
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</tr>
<tr>
<td>Sum squared resid</td>
<td>58065.16</td>
<td>Schwarz criterion</td>
<td>9.112545</td>
<td></td>
</tr>
<tr>
<td>Log likelihood</td>
<td>-517.0470</td>
<td>Hannan-Quinn criter.</td>
<td>9.098284</td>
<td></td>
</tr>
<tr>
<td>Durbin-Watson stat</td>
<td>0.018649</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Conclusion and assessment:

- GDP indices of the countries have a high level of relation with actual individual consumption indices in the same direction.
- GDP indices of the countries have a high level of relation with price level indices in the same direction.
- Actual individual consumption indices of the countries have a high level of relation with price levels indices in the same direction.
- There is a relation of causality between actual individual consumption and GDP.
- There is a relation of causality between price level indices and GDP.
- A one-unit increase in actual individual consumption increases GDP by 1.10 units.
- A one-unit increase in price level indices increases GDP by 1.06 units.

A detailed consideration of the subject of purchasing power parity (PPP) shows that Turkey lags behind the EU member countries by a rate of 47% in terms of personal income and expenditure parity. In addition, it has a parallelism with the EU candidate countries while it has quite high purchasing power parity when compared to Greece, an EU member country. Luxembourg is above the EU average for GDP index per capita by a percentage of 163% while Bosnia & Herzegovina has a value that is 72% below the EU average. According to the 2014 data, Turkey has an actual individual consumption level of 57% and is above the general average. In this respect, it follows a similar course to that of developing and developed countries. According to the comparison of the development level of the countries, Luxembourg appears to have the highest purchasing...
power parity in terms of gross domestic product per capita. And Albania seems to have the lowest purchasing power parity with 34% individual consumption rate per capita.

REFERENCES