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Testing the Validity of PPP Theory for Turkey: Nonlinear Unit Root Testing

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Abstract

Real exchange rate movements are crucial for a country's competitiveness, trade flows and testing the validity of Purchasing Power Parity (PPP) theory. So far ample of studies have examined the issue of whether or not PPP holds in Turkey by employing various methods. In this study we examined the validity of PPP theory for Turkey between January 2003 and June 2014, and we concluded that purchasing power parity theory is not valid according to the results of nonlinear unit root test.

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1. Introduction

Purchasing power parity theory (hereafter PPP) has been one of the most controversial and most studied theories in the field of economics. After the collapse of the gold standard and large-scale inflations in industrialized countries during and after the World War I, specifically introduced by Cassel (1918) to substitute the relative gold parities, PPP states that the nominal exchange rate between two currencies should be equal to the ratio of general price levels of the two countries. If PPP holds a unit of currency of one country will have the same purchasing power of other country (Taylor & Taylor, 2004). Cassel (1918) asserts that, equalizing their post-war and pre-war exchange rates changes to the difference between their post-war and pre-war inflation rates, countries virtually adopted PPP. Since then, PPP has been used in setting and forecasting exchange rates, in cross-country income adjustment to account for differences in national prices (Alba & Papell, 2007).

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As Taylor & Taylor (2004) defined, according to the PPP theory, if a unit of currency able to buy same basket of goods in one country as the equivalent amount of foreign currency can buy in a foreign country, then PPP holds. Hence, there is parity in the purchasing power of the unit of currency across both economies. The main rationale behind the validation of PPP is so-called Law of One Price, which means that the price of a good which is subject to international trade should be same in every market in the world once that its price is expressed in a common currency.

According to PPP, the real exchange rate between two currencies should be one. So a real exchange rate is of the form

$$R = \frac{EP^*}{P} = 1 \quad (1)$$

where E denotes nominal exchange rates, P denotes host country's prices level and P* is prices level in foreign country. A real exchange rate that equal to unity means that a basket of goods in one country should be worth one basket of goods in another (Bahmani-Oskooee & Hegerty, 2010; Taylor & Taylor, 2004; Krugman & Obstfeld, 2003). Thus, the nominal exchange rate can be written as

$$E = \frac{P}{P^*} \quad (2)$$

In order to check out the relevance of this argument, unit root and cointegration test procedures have generally been adopted. In testing PPP by means of unit root test, it is investigated whether real exchange rates has unit root. If exchange rates does not have unit root this seen as an evidence of the validity of PPP theory. In the cointegration framework, on the other hand, presence of co-movement between the nominal exchange rates and the ratio of host and foreign country's price level is traced. At this point, when we look at the studies those aimed at investigating the theory of PPP, unit root tests, it seems that nonlinear unit root tests have been preferred rather than linear unit root tests. This case stems from the acceptance that linear unit root tests are weaker than nonlinear tests methods in examining whether a nonlinear time series contain unit root (Taylor, 2001; Taylor et al., 2001; Chang et al., 2012; Taştan, 2005).

In this paper it is aimed to investigate the validity of PPP theory via nonlinear unit root test method in the case of Turkey. A brief inquiry will show that studies aimed to test PPP theory for Turkey mostly employed linear unit root test techniques. Therefore, this study contributes the present literature by this way. Accordingly, the study is divided into five sections. In the following section the related literature was given briefly in a tabular form. Section 3 and 4 devoted to introducing the empirical method and results of analysis. The paper concludes in section 5.

2. Related Literature

There is plethora of studies that empirically tested if the PPP theory holds in developed countries or developing countries as well, in a certain country or a group of countries as well. Studies also differ in terms of employed methodology. Most of them used linear unit root and cointegration tests either with or without structural breaks whereas others applied long memory model or Markov switching model. A brief of these studies is given in Table 1 below.

Table 1: Brief of the related literature.

| Author(s) | Period | Method(s) | Result(s) |
|---------------------------|-----------|-----------------------------------|--|
| Telatar & Kazdağlı (1998) | 1980-1993 | Cointegration Test | PPP is not valid in Turkey |
| Demir & Kıymaz (1999) | 1969-1996 | Unit root and Cointegration Tests | PPP is valid in Turkey, Germany and France in 1969-1996 period whereas not valid in none of the sub-periods of before and after 1980 |

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