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Evidence of purchasing power parity for the floating regime period

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Abstract

This paper investigates the PPP hypothesis within industrialized countries for the post-Bretton Woods period via two panel unit root tests, the DF–GLS–SUR and the ADF–SUR tests, respectively developed by Lopez [A panel unit root with good power in small samples. Econometric Reviews, in press] and Levin et al. [2002. Unit root tests in panel data: asymptotic and finite-sample properties. Journal of Econometrics 108 (1), 1–24]. Both approaches allow for data specific serial and contemporaneous correlation. While both tests provide PPP evidence for the post-1973 period, the more powerful DF–GLS–SUR test demonstrates consistently stronger results, especially for the 1973–1998 period.
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1. Introduction

The purchasing power parity (PPP) hypothesis is a fundamental assumption for many open economy and international trade models. The PPP hypothesis stipulates a proportional relationship between nominal exchange rates and relative national prices, implying constant real exchange rates over time. This facilitates in the prediction of exchange rates as well as in

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comparisons of macroeconomics outcomes among various countries. Despite being a fundamental assumption in most relevant open economy models, the empirical validity of the PPP hypothesis remains unclear, especially for the post-Bretton Woods period. Several authors, such as O'Connell (1998), Papell (2004) and Taylor (2003), strongly question the validity of the PPP evidence proposed by the literature for this period. They show the inadequacy of the testing techniques used and its impact on the results accuracy.

The objective of the present paper is to reinvestigate the empirical validity of the PPP hypothesis for the flexible regime period (1973–1998) within industrialized countries via a more accurate test developed by Lopez (in press).

Research in the 1980s does not confirm the empirical validity of the PPP hypothesis. Hence, several authors question the reliability of the testing methods used when applied to short spans of data. Among them, Frankel (1986) and Lothian and Taylor (1996) show that data extensions to a minimum of one century lead to PPP evidence. Frankel (1986) considers annual data from 1869 to 1984 for the dollar-sterling real exchange rate while Lothian and Taylor (1996) focus on two-centuries data for dollar-sterling and franc-sterling real exchange rates. While the latter study discriminates between fixed (prior to 1973) and flexible (after 1973) regime periods, it cannot analyze the post-1973 period due to a lack of observations (only 17 points).[1] Thus, it is unclear whether the PPP hypothesis holds specifically for the flexible regime period. Additional drawbacks of using long data spans are pointed out by Hegwood and Papell (1998) and Engel (2000). These studies, respectively, show that traditional unit root tests cannot account for the existing structural shifts, and that such tests have a tendency to over accept the stationarity hypothesis when applied to extended data.[2]

An alternative approach to test the PPP hypothesis is to increase the number of real exchange rates considered at the estimation level. Panel unit root tests, notably, Levin et al. (2002), Im et al. (2003) and Maddala and Wu (1999), combine time-series and cross-sectional information in order to improve the power of standard unit root tests. Numerous studies, such as Frankel and Rose (1996), Jorion and Sweeney (1996), MacDonald (1996), Oh (1996), Wu (1996), Papell (1997) and Papell and Theodoridis (2001) use these new techniques and find the evidence of PPP. Yet, these results strongly depend on the amount of data considered (panels width and length).

Instead of extending the data, Elliott et al. (ERS) (1996) increase the accuracy of the standard unit root test by transforming the data and then testing it. Using this new procedure, Cheung and Lai (2000) and Taylor (2002) find some evidence of PPP. Then again, the strength of the results depends on the data length.

While these techniques provide significant power improvements, they still have major difficulties in studying the real exchange rate behavior for the flexible period. Indeed, these data have limited lengths and are highly persistent. In a recent work, Lopez (in press) proposes a new panel unit root test, the DF–GLS–SUR test, which performs well, especially when applied to highly persistent data with a small number of observations.

In this paper, the PPP evidence is investigated for the post-Bretton Woods period via two approaches testing for the *entire* panel stationarity: Lopez (in press) and Levin et al. (2002). Considering several real exchange rates, all need to be stationary for the PPP hypothesis to hold. Furthermore, we allow for data specific serial and contemporaneous correlation and calculate data specific critical values.

[1] Using Monte Carlo simulations, Lothian and Taylor (1997) show the lack of power of the standard unit root test when dealing with the 1973–1990 yearly data.

[2] Hegwood and Papell (1998) find strong rejections of the unit root and of the non-structural change hypotheses.

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