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Decline in the persistence of real exchange rates, but not sufficient for purchasing power parity

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The paper investigates the possibility of decline in the persistence of real exchange rates, or deviations from PPP. To this end, we test the null hypothesis of no decline in the PPP deviation persistence between two subsamples using a fractional integration framework. The test rejects the null at the 10% significance level for nine out of 17 countries, providing solid evidence for a decline in the persistence of real exchange rates. However, the decline is not sufficient for PPP, meaning we fail to reject the unit root hypothesis even in the latter period for all 17 countries. In addition, our rolling-window estimates show that the real exchange rate of many countries have experienced a sharp drop in their persistence once we use samples starting from the mid-1980s. Finally, we examine the relationship between the dynamics of PPP deviation persistence and several economic variables and confirm that the speed of convergence of PPP deviations is highly related to economic/financial integration and world economic stabilization. *J. Japanese Int. Economies* **24** (3) (2010) 395–411. a Graduate School of International Corporate Strategy (ICS), Hitotsubashi University, 2-2-1 Hitotsubashi, Chiyoda-ku, Tokyo 101-8439, Japan; bDepartment of Economics, Hitotsubashi University, 2-1, Naka, Kunitachi, Tokyo, 186-8601 Japan; cDepartment of Economics, Queen's University, Kingston, Ontario, K7L 3N6 Canada.

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1. Introduction

Purchasing power parity (PPP) is one of the most important, and empirically controversial, theories in international macroeconomics. PPP simply advocates that the equilibrium exchange rate of two currencies should equalize their purchasing power. The idea behind PPP is very intuitive: once converted to a common currency, national price levels should be equal. Although many researchers believe that some variant of PPP holds in the long-run, there are diverse empirical results regarding the PPP hypothesis, in particular for the recent floating rate period.

In this paper, we examine the PPP hypothesis from a different point of view than previous studies. Specifically, we investigate the possibility of decline in the persistence of real exchange rates, or deviations form PPP, by testing the null hypothesis of no decline in the persistence of PPP deviations in the last 30 years. Furthermore, we examine the dynamics of the persistence of PPP deviations during the last three decades. To our best knowledge, none of the previous research investigates changes in the persistence of real exchange rates systematically. There are, however, several interests to examine the dynamics of the persistence of PPP deviations. The first relates to financial market integration. According to IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions* (AREAER), many industrial countries experienced a rapid increase in the degree of financial openness since mid-1980s.[1] Likewise, the *de facto* measures recently constructed by Lane and Milesi-Ferretti (2006) indicate that financial integration in industrial countries was promoted gradually in the 1970s and 1980s, and accelerated in the mid-1990s.[2] From these observations, we can imagine that PPP should hold more naturally in recent periods. It is, therefore, instructive to examine whether we can find a stronger evidence of PPP in more recent integrated real exchange rates.

Another interest comes from the US and world economic stabilization. Following Kim and Nelson (1999) and McConnell and Perez-Quiros (2000), who point out a sharp decline in the variance of the US economic growth rate in the mid-1980s, several studies provide evidence of commensurate changes toward US/world economic stabilizations. For instance, Clarida et al. (2000) estimate a forward-looking monetary policy function, and show that the US monetary policy has been more stabilizing after 1980. Stock and Watson (2002) and Sensier and van Dijk (2004) find declines in the volatility in a number of US economic time series around the mid-1980s, including series such as employment growth, consumption growth, wage, and price inflation. Following these studies, Kim et al. (2004) and Herrera and Pesavento (2005) provide further supports for the US economic stabilization by identifying possible explanations for the reduction of the variance in US GDP growth. Regarding world economic stabilization, Stock and Watson (2005) find a reduction in the magnitude of the common international shocks contributing to a substantial moderation in the volatility of the GDP growth rates over the past 40 years in the G7 countries (except for Japan).

In addition, recent literature finds a corresponding decline in inflation persistence in the US and other industrial countries. For instance, Kumar and Okimoto (2007) find a marked decline in the US inflation persistence around the early 1980s.[3] Furthermore, they find similar declines in the inflation persistence of other G7 countries, except for Italy, suggesting the possibility of world economic stabilization. A natural question raised from these studies is whether we can observe commensurate changes toward world economic stabilization for other economic variables. This paper provides an answer to this question for real exchange rates, or deviations from PPP. If there is a decline in the persistence of real exchange rates, as we will show in this paper, this indicates new evidence of world economic stabilization toward PPP.

The null hypothesis to be investigated formally in this paper is that there has been no significant decline in the persistence of deviations from PPP over the past three decades for industrial countries. This hypothesis is tested against the alternative that there has indeed been a marked and sustained decline in the persistence of PPP deviations. To this end, we employ a fractional integration framework, which provides a powerful tool to detect changes in the persistence for highly persistent time series, here real exchange rates. In the fractional integration framework, our null hypothesis is formu-

[1] AREAER reports a set of *de jure* measures of legal restrictions on cross-border capital flows, and is widely used to measure financial openness.

[2] See Kose et al. (2006) for details of financial integration and related measures.

[3] See Taylor (2000) and Cogley and Sargent (2001, 2005) for other studies which find a similar decline in US inflation persistence.

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