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Purchasing power parity and the impact of the East Asian currency crisis

R. Zurbruegg[a,*], L. Allsopp[b]

[a]School of Commerce, Adelaide University, 5005 Adelaide, Australia
[b]School of Economics, Adelaide University, 5005 Adelaide, Australia

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Abstract

This paper explores the impact of the East Asian crisis of 1997–1998 on foreign exchange markets and purchasing power parity within the region. While many studies have attempted to test for PPP prior to these events, there has been little opportunity to test for this long run phenomenon in the post-crisis period. This study addresses the issue by applying Inoue [J. Econometrics 90 (1999) 215] and Johansen, Mosconi, and Nielsen [Econometrics J. 3 (2000) 216] cointegration procedures to bilateral exchange rates deflated using consumer price indices. Along with endogenously determining a structural break at the time of the crisis, the empirical results shed light upon the significance of the East Asian crisis on long-run PPP within the region. The findings are generally supportive of PPP with the crisis leading to only shifts in long-run trends. However, the results are not homogenous across all countries which is partially attributed to how individual countries handled the crisis.

JEL classification: F31; F41; C22

Keywords: Cointegration; Exchange rates; Purchasing power parity

1. Introduction

Although a considerable amount of literature exists on the causes of the 1997 Asian currency crisis (De Brouwer, 1999; Krugman, 1998; McLeod & Garnaut, 1998) and also on market integration and long run relationships between various Asian capital markets prior to the crisis (Hsieh, Lin, & Swanson, 1999; Phylaktis, 1999), very little research to date has

* Tel.: +61 8 8303 5535; fax: +61 8 8303 4368.
E-mail address: ralf.zurbrugg@adelaide.edu.au (R. Zurbruegg).

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examined the impact of the crisis on the long term dynamics of the East Asian foreign exchange market.

There are two basic reasons for this current lack of research. First, in order to determine the long run impact of the crisis upon foreign exchange realignment, a sufficient time period needs to elapse before a reliable analysis can take place. Second, to examine long run stochastic trends of FX rates where a crisis has impacted upon these markets requires research methods that account for structural breaks and regime shifts.

This paper addresses the above issues by examining a period covering the Asian crisis (1990–2002) and utilizing the Inoue (1999) technique to identify structural breaks within a multivariate cointegration structure. These breaks are then incorporated within a framework outlined by Johansen, Mosconi, and Nielsen (2000) to test for purchasing power parity (PPP) in a number of East Asian currencies. Doing so will help answer whether the Asian crisis led to permanent or just transitory changes in foreign exchange rate relationships, and how this may have differed between the various Asian countries, some of which employed different currency management regimes. In particular, for policy-makers, these issues are of major interest. An understanding of whether the relationship between consumer prices and foreign exchange rates can change due to a crisis can lead to the necessity for analysts to further examine and identify economic and exchange rate policies to deal with similar crises in the future.

To examine the above issues, the rest of the paper is organized as follows. First, there is a brief summary of the underlying PPP theory and the literature to date. Second, the methodology used in this paper is described in full. The fourth and fifth sections set out the data sources and provide the results from the cointegration tests together with a discussion of the robustness of the model in each instance. The sixth section provides a conclusion.

2. Purchasing power parity

Purchasing power parity forms the cornerstone to any model examining long run exchange rate movements. Therefore, the debate surrounding PPP is as relevant now as when it was first discussed a century ago.

In short, the PPP condition requires that price levels between countries are equalized when expressed in terms of a common currency so that:

$$P_t = S_t P_t^* \tag{1}$$

where P_t is the domestic price level, P_t^* is the foreign price level and S_t is the nominal exchange rate expressed as the domestic price of the foreign currency. In logarithmic form this becomes:

$$s_t = p_t - p_t^* \tag{2}$$

and hence the real exchange rate measuring deviations from PPP is:

$$q_t \equiv s_t - p_t + p_t^* \tag{3}$$

An empirical test of PPP gives Eq. (4):

$$s_t = q_t + \beta_1 p_t - \beta_2 p_t^* + \mu_t \tag{4}$$