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An empirical investigation on sustainability of balancing item in Asian countries

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This study explores the sustainability of the balancing item in Asian economies. The conventional unit root tests (includes panel tests) illustrate that the results are rather inconclusive. However, the results from the series-specific panel unit root test consistently illustrate that five of the countries (Singapore, Bangladesh, Indonesia, Korea and Malaysia) balancing item is on the sustainable path. For other remaining eight countries (Maldives, Mongolia, Myanmar, Nepal, Pakistan, the Philippines, Sri Lanka and Thailand), there is evidence that her balancing item of balance of payments accounts is unsustainable.

I. Introduction

In 1971, Duffy and Renton (1971) published their work on an analysis of the UK balancing item. Twenty-six years later, study on balancing item in Australia's balance of payments accounts has been extensively carried out by Fausten and Brooks (1996), Tombazos (2003) and Fausten and Pickett (2004). In addition, Tang (2005, 2006a, b) has examined the economic factors that contribute to the balancing item in Japan's balance of payments accounts and the studies documented that Japan's balancing item is essentially due to timing errors. Clearly, studying the balancing item of balance of payments accounts has recently received special attention from researchers and policymakers.

By definition, double entry bookkeeping principle tells us that balance of payments accounts are constrained by the 'adding up' problem – total debit is not equal to total credit. As a result, a value so-called errors and omissions, is then added in order to validate this principle. The balancing item is obtained simply by calculating the difference between total recorded credit transactions and total recorded debit transactions per time period (Brooks and Fausten, 1998, p. 31). The net balance of errors (transactions that are recorded incorrectly) and omissions (transactions that are not recorded at all) constitute the balancing item (Fausten and Brooks, 1996, p. 1303). The size of balancing item indicates the reliability of balance of payments statistics. Moreover, a positive value of the balancing item does suggest a systematic over-reporting of debit transactions, or under-reporting of credit transactions and vice versa. In this context, the policymakers may concern on the sustainability of the balancing item in balance of payments accounts in a country. This is important as balance of payment statistics are deemed to provide signals about the directions of economic policy (Fausten and Brooks, 1996).

A simple analytical framework that has been developed in this study is, BI (balancing item) = total credit transactions (C) – total debit transactions (D). Applying Engle and Granger's (1987) cointegration

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approach, BI can be treated as error term of simple linear regression equation, C = aD (where a is the coefficient of D and it is assumed to be equal to one). If BI series is found to be stationary, this result implicitly suggests cointegration between total credit transactions (C) and total debit transactions (D) and hence implying that BI series is sustainable.

From an intensive literature search, none of the work is available in testing the sustainability of balancing item, especially in Asian economies' balance of payments accounts. The purpose of this study is to explore the sustainability of balancing item in Asian economies via various types of unit root tests, but more precisely using the series-specific panel unit root test (Breuer *et al.*, 2002, SURADF).

II. Data and Method

Data

The balancing item series ('errors and omissions' variable) are obtained from *International Financial Statistics* (International Monetary Fund). Annual data is considered in this study because of inconsistence of quarterly data for a sufficient sample span. The following countries have been sampled for analysis based on data availability. They are Bangladesh, Indonesia, Korea, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Pakistan, the Philippines, Singapore, Sri Lanka and Thailand.

Methods

As illustration purpose, this study estimates various panel unit root tests developed in the last decade Among them are from Levin and Lin (1993, LL),[1] ADF–Fisher chi-square, ADF–Choi, PP–Fisher chi-square and PP–Choi (Maddala and Wu, 1999; Choi, 2001), Breitung (2000, UB), Hadri (2000, HADRI) and Im *et al.* (2003, IPS). It is followed by a set of individual unit root tests for testing the univariate stationary process of each of the country's balancing item. The details of those tests are not presented here, but they are well documented in literature and are available from the original articles. A common feature of the panel tests mentioned earlier is that they maintained the null hypothesis of a unit root in all panel members except for Hadri test. Therefore, their (non) rejection indicates that at least one panel member is stationary, with no information about how many series or which ones are stationary.

In addressing this issue, Breuer *et al.* (2002, SURADF) developed a panel unit root test that involves the estimation of the augmented Dickey–Fuller (ADF) regression in a SUR framework and then tests for individual unit root within the panel members. This procedure also handles heterogeneous serial correction across panel members. Importantly, the test minimized the possibility of the misleading conclusion of stationarity when only one panel member behave in a stationary manner. The SURADF test is based on the system of ADF equations that can be expressed as

$$\begin{aligned}
\Delta y_{1,t} &= \alpha_1 + \beta_1 y_{1,t-1} + \sum_{j=1} \varphi_j \Delta y_{1,t-j} + u_{1,t} \\
\Delta y_{2,t} &= \alpha_2 + \beta_2 y_{2,t-1} + \sum_{j=1} \varphi_j \Delta y_{2,t-j} + u_{2,t} \\
&\vdots \\
\Delta y_{N,t} &= \alpha_N + \beta_N y_{N,t-1} + \sum_{j=1} \varphi_j \Delta y_{N,t-j} + u_{N,t}
\end{aligned} \tag{1}$$

where, $\beta_j = (\rho_j - 1)$, ρ_j is the autoregressive coefficient for series j and $t = 1, \ldots, T$. This system is estimated by the SUR procedure with the null and the alternative hypotheses are tested individually as

$$\begin{aligned}
&H_0^1: \beta_1 = 0; \quad H_A^1: \beta_1 < 0 \\
&H_0^2: \beta_2 = 0; \quad H_A^2: \beta_2 < 0 \\
&\vdots \\
&H_0^N: \beta_N = 0; \quad H_A^N: \beta_N < 0
\end{aligned}$$

with the test statistics computed from SUR estimates of system (1), while the critical values are generated by Monte Carlo simulations. This procedure posed several advantages. First, by exploiting the information from the error covariances and allowing for autoregressive process, it produced efficient estimators over the single equation methods. Second, the estimation also allows for heterogeneous fixed effect, heterogeneous trend effects and heterogeneity in lag structure across the panel members. Third, the SURADF test allows us to identify how many and which member(s) of the panel contain a unit root.

As this test has nonstandard distributions, the critical values of the SURADF test must be obtained through simulations. In the Monte Carlo simulations, the intercepts, the coefficients on the lagged values for each series were set equal to zero. In what follows, the lagged differences and the covariances matrix were obtained from the SUR estimation on the actual fiscal position data from the sampled countries. The SURADF test statistic for each of these series was then computed as the t-statistic individually for the

[1] One may also refer to the revised version of their paper in Levin *et al.* (2002).