E C O N O M I C S B U L L E T I N

The impact of the appreciation of East Asian currencies on global imbalance

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Abstract

Recently, the global current account imbalance has received considerable attention in the international financial market. In this paper, we focus on the relationship between US and East Asia from the perspective of the trade balance and examine whether the appreciation of East Asian currencies against the dollar would affect the respective outputs of East Asia and the US or be effective in reducing the global imbalance. There are few empirical studies directly focused on the trade and output between the US and East Asia. Our empirical results suggest that currency appreciation is expansionary for East Asian economies and will increase the East Asian output, which will contribute to the reduction in US trade deficits.

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I. Introduction

Recently, the global current account imbalance has received considerable attention in the international financial market. The US current account deficit has increased to over 6% of GDP. Especially the US imports from the East Asian economies have expanded; moreover, East Asia accounted for approximately 60% of the US trade balance deficits in December 2006.

Correspondingly, the current account balances of various countries, particularly Japan and major developing East Asian economies, have had a surplus of over 5% of GDP in recent years. A number of East Asian countries have built up large quantities of foreign-exchange reserves since the Asian crisis in 1997–98, in view of the foreign exchange interventions intending to promote export-led growth by preventing exchange-rate appreciation (Dooley, Folkerts-Landau, and Garber, 2004). At present, many economists opine that this imbalance requires adjustment by foreign exchange rate; however, concurrently, it is feared that a reduced US trade account deficit could damage economic activity.

This paper intends to focus on the relationship between the US and East Asia from the perspective of trade balance.

Our research aims to examine whether the appreciation of East Asian currencies against the dollar would affect the respective outputs of East Asia and the US or be effective in reducing the global imbalance. This analysis could provide crucial information regarding policy implementation for adjusting the global imbalance, because few empirical studies directly focus on the trade and output between the US and East Asia.

The effect of the foreign exchange rate change on the output is theoretically ambiguous. For example, the devaluation of the domestic currency can be expansionary. In such a case, the Marshall–Lerner elasticity condition for stability is considered to be satisfied; therefore, trade balance improves with devaluation. In the context of the AD-AS model, currency devaluation increases the aggregate demand by increasing net exports. The potentially adverse supply-side effects are either ignored or assumed to be minor.

However, a contractionary devaluation may occur regarding the aggregate demand: the trade balance may worsen if the price elasticities of export and import demands are too low or the initial trade balance is in deep deficit. Further, devaluation reduces aggregate demand by raising the domestic price levels through increasing the prices of imported goods, thereby lowering the real money balance. In East Asia, particularly, currency devaluation can increase debt-servicing obligation and generate stagflationary effects since some domestic firms continue to hold liabilities in foreign currency.

Some empirical studies found that devaluations tended to be contractionary (Edwards, 1989; Morley, 1992; Upadhyaya, 1999, Kamin and Rogers, 2000;

Upadhyaya et al., 2000). On the other hand, Kim and Ying (2007) showed no evidence of contractionary devaluations using the pre-1997 crisis data.

However, few empirical studies evaluated the effect of the foreign exchange rate change on the respective outputs of East Asia and the US.

II. The Model

Our model contains seven variables: East Asia's real exchange rate against the dollar (RERA), non-East Asia's real exchange rate against the dollar (RERO), US output (GDPUS),East Asian output (GDPA), non East Asian output (GDPO), US net export to East Asia (BOPA＝EXA/IMA), US net export to non-East Asia (BOPO＝EXO/IMO).

This paper considers the East Asian countries of Japan, China, Hong Kong, Taiwan, Korea, Singapore, Thailand, Malaysia, Philippines and Indonesia. These East Asian economies are treated as comprising one economic block, with a strengthening macroeconomic interdependence (Kawai, 2005). These economies might have been affected by US economic cycles because their linkages were strengthened by modern information technology (IT) products. We used the structural vector autoregression (SVAR) analysis proposed by Blanchard and Quah (1989).

Our identifying assumptions involve the contemporaneous coefficient matrix and can be summarized in the following equations that link the reduced-form errors to the structural shocks.

$$\begin{bmatrix} e_{RERA} \\ e_{RERO} \\ e_{GDPUS} \\ e_{GDPA} \\ e_{GDPO} \\ e_{BOPA} \\ e_{BOPO} \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 & g_{14} & 0 & 0 & 0 \\ g_{21} & 1 & 0 & 0 & g_{25} & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 0 & 0 \\ 0 & 0 & g_{43} & 1 & 0 & 0 & 0 \\ 0 & 0 & g_{53} & g_{54} & 1 & 0 & 0 \\ g_{61} & 0 & g_{63} & g_{64} & 0 & 1 & 0 \\ 0 & g_{72} & g_{73} & 0 & g_{75} & 0 & 1 \end{bmatrix} \begin{bmatrix} u_{RERA} \\ u_{RERO} \\ u_{GDPUS} \\ u_{GDPA} \\ u_{GDPO} \\ u_{BOPA} \\ u_{BOPO} \end{bmatrix} \quad (1)$$

In the above equations, the e_j represent the residuals in the reduced-form VAR equations. , and the u_j represent the structural disturbances

III. Data

RERA is measured as follows:

$$RERA_t = \sum w_{i,2000} * NERA_{i,t} * CPI_{us,t} / CPI_{i,t} \quad (2)$$

Here, NERA is each country's nominal exchange rate against the dollar; CPI is the

consumer price index; w_i is calculated from the total trade between each East Asian country and the US. The nominal exchange rate is taken from IMF; the CPI data, from the Datastream database. RERO is calculated by using price-adjusted broad dollar Index (FRB releases) and trade weight.

GDPUS is US real GDP released by US Department of Commerce. GDPA is the real GDP of nine countries excluding Hong Kong. GDPO is calculated by deducting GDPUS and GDPA from the real GDP of total OECD countries. We converted the frequency of GDP data into monthly basis by using E-views software.

Since we do not have the actual data regarding US real exports to each country, we deflated the nominal export to each country by using the US export deflator released by the US Census. We formulated the export to non-East Asia (EXO) by subtracting the real export to the East Asian countries (EXA) from the total real export to all countries.

Regarding US import data, we deflated the nominal import from each country based on each country's CPI. The import from non-East Asia (IMO) was the total real import from all the countries minus the real import from the East Asia countries (IMA). The US total export and import data were based on the seasonally adjusted real exports and imports of goods by principal end-use category. These were derived from the US Census Bureau's chain weighted index for 2000, estimated in dollars.

All the variables were entered into natural logarithms. The data comprise monthly observations from January 1994 to December 2006, reflecting data availability.

IV. Estimation results

Before conducting the SVAR analysis, we tested the order of integration for all the time series. The augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) tests reveal that the hypothesis of a non-stationary level cannot be rejected at the 1% significance level for any of the series. However, the results for the first difference clearly indicate that the non-stationary hypothesis can be rejected. Consequently, all the seven endogenous variables are considered as integrated to the order of one. We assume that the number of lags is 3. We introduced a dummy in the VAR (d = 1 for December 1997, otherwise d = 0) to account for the potential effects of the structural break.

Figure 1 displays the responses of other variables to a one-standard deviation innovation of a particular structural shock on RERA depreciation over a 36-month period and contains ±2 standard error bands. Figure 1 indicates that the output of the East Asian countries (GDPA) will significantly increase by their currencies' appreciation (negative shock). This result implies that contractionary devaluation occurs in East Asia.

The US output (GDPUS) will increase slightly, though insignificantly, when the East Asian currencies appreciate. This could be because GDPUS can be positively

affected by GDPA. US net export to East Asia (EXA/IMA) will increase because Asian currencies appreciating against the dollar enhances the competitiveness of US products.

Figure 2 displays the responses of US net export to East Asia (EXA/IMA) to other variables. US net export to East Asia will increase by the expansion in East Asian output (shock 4) and non East Asian output (shock 5) as both GDP can be positively correlated.

These results show that the appreciation of East Asian currency will boost domestic demand in East Asia and US net export to East Asia.

V. Conclusion

This paper aimed to examine the effect of the change of RERA on global imbalance by constructing a seven-dimensional version of the SVAR model. Our empirical results suggest that currency appreciation is expansionary for East Asian economies and will increase East Asian output, which will improve US net export to East Asia

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Figure 1 Impulse responses to East Asian currency shock

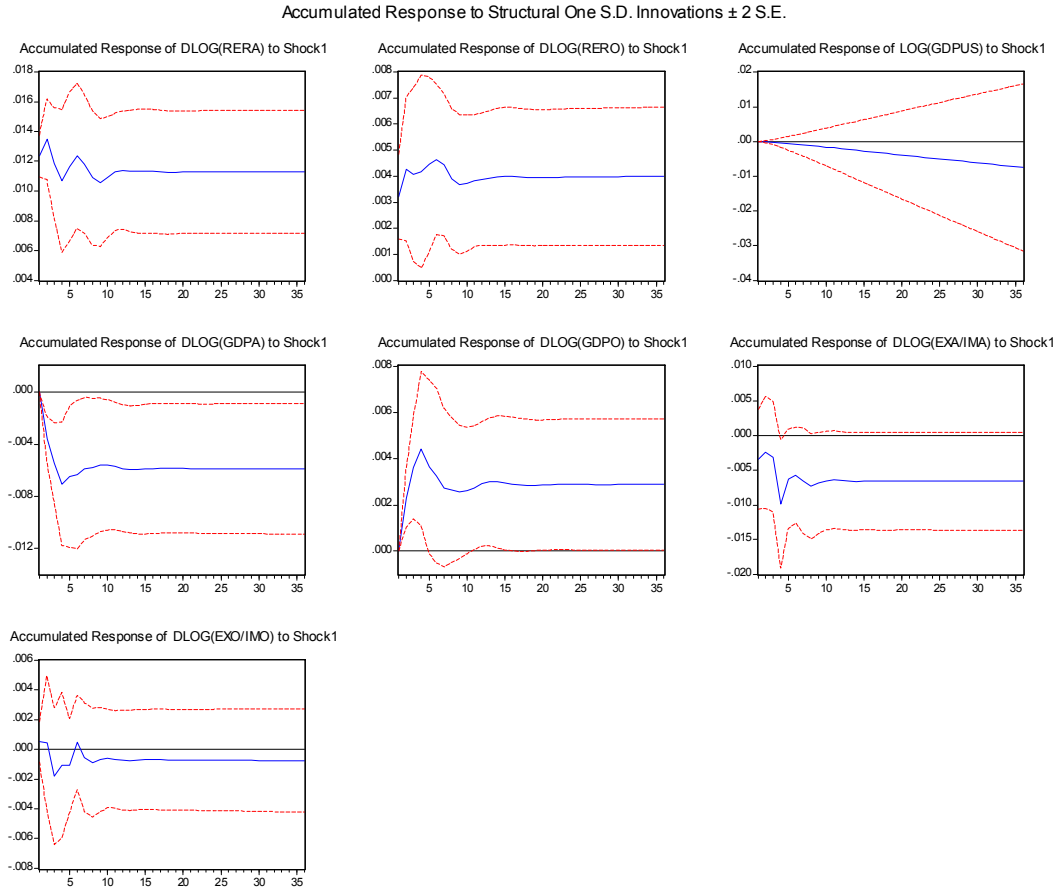

Figure 2　Impulse responses of US net export to East Asia