# Possible depreciation of the US dollar for unsustainable current account deficit in the United States

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The United States has been faced with an increasing current account deficit since the latter half of the 1990s. Its current account deficit stood recently at over 6 percent of GDP. We remember that the current account deficit was over 3 percent of GDP in the mid-1980s when the US dollar was rapidly depreciated after the Plaza Accord in September 1985. The current account deficit of recent years has been regarded as being at a dangerous level when compared with its size in the mid-1980s.

Although the US dollar began to weaken several months before the Plaza Accord, its depreciation gained momentum after this event. The real effective exchange rate of the US dollar depreciated by nearly 40 percent from its peak in early 1985 to early 1988 as shown in Figure 1. Following the depreciation, the current account deficit declined from 3.4 percent of GDP in the last quarter of 1986 to 1.4 percent in the second quarter of 1990.

The current account can be decomposed into the trade balance, net income receipts from abroad and unilateral current transfers, as shown in Figure 2. The trade balance has almost continuously deteriorated. Income receipts have been decreasing along a gentle trend as the international investment position deteriorated.[1] Unilateral current transfers are stable except for the first quarter of 1991 when the United States received the military transfers on the Gulf war from the allies.

[1] The Bureau of Economic Analysis of the US Department of Commerce reported that the United States has shifted from a creditor to a debtor position in 1986 if the direct investment position is valued at current cost, or in 1989 if it is valued at market value.
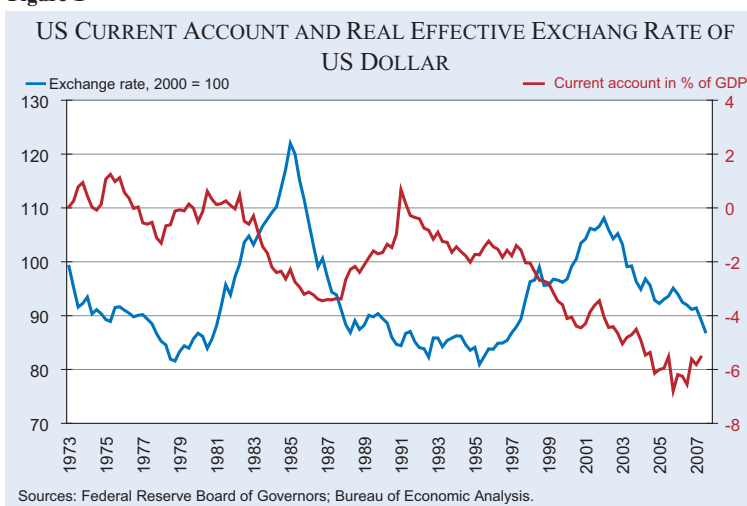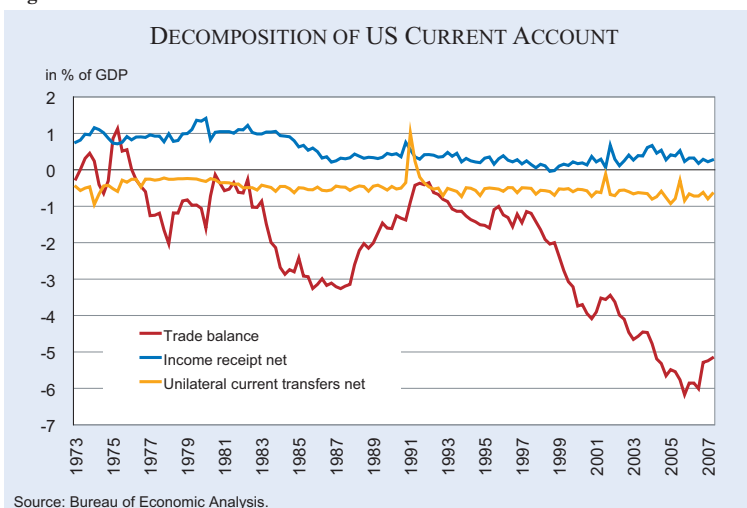
**Figure 1**



US Current Account and Real Effective Exchang Rate of US Dollar

Sources: Federal Reserve Board of Governors; Bureau of Economic Analysis.

**Figure 2**



Decomposition of US Current Account

Source: Bureau of Economic Analysis.

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**Figure 3**

US SAVING-INVESTMENT BALANCE

in % of GDP
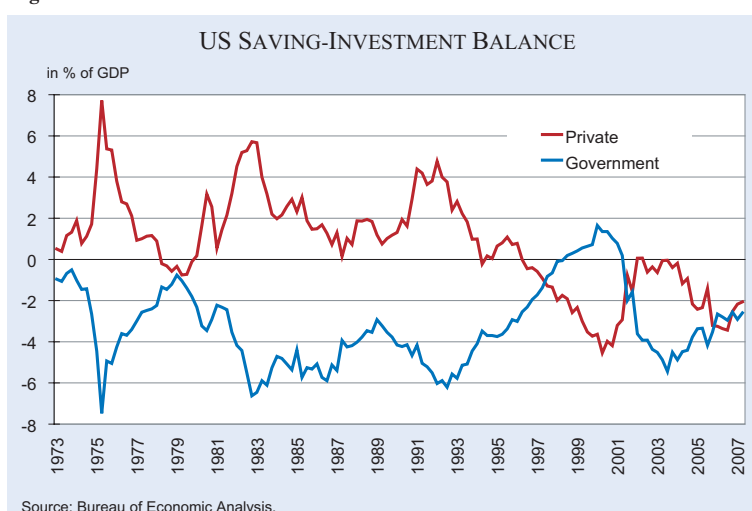


Source: Bureau of Economic Analysis.

Figure 3 shows the saving-investment balances for each of the private and government sectors. The private sector had excess savings during almost the entire period until 1995, while the government had excess investments. Although the government sector had excess savings around 2000, both of the private and government sectors have had excess investments since 2003.

Some researchers question whether the US current account deficit is sustainable at the current exchange rate of the US dollar because the current account deficit is increasing and has exceeded 6 percent of GDP.[2] We might need another "Plaza Accord". However, we have already observed the recent appreciations of the euro, the Japanese yen, and some other currencies that are floating against the US dollar while other currencies have been officially or *de facto* fixed to the US dollar and have been depreciating against the above currencies at the same time.

This paper will firstly demonstrate the empirical results from Kudo and Ogawa (2003) and Ogawa and Kudo (2004) regarding the unsustainable US current account deficit (see the next section). Furthermore, we will present some results from a simulation analysis (Ogawa and Kudo 2007) to show how much depreciation of the US dollar is needed to reduce the current account deficit. Estimated VAR models are used to conduct the simulation analysis about the impact of hypothetical exchange rate

movements on the current account deficit. In conclusion, we will point out that the US dollar depreciation will have asymmetric effects on the other currencies, given the fact that some currencies are formally or *de facto* fixed to the US dollar.[3]

**Unsustainable current account deficit in the United States**

Many researchers investigated sustainability of the current account deficit in the United States. Among them, Kudo and Ogawa (2003) and Ogawa and Kudo (2004), using the methodology of Bohn (1995) and Ahmed and Rogers (1995) in order to derive the necessary and sufficient conditions for a sustainable current account deficit. In this context the sustainability of the current account deficit was empirically analyzed from a perspective based on the domestic investment-savings relationship or international capital flows as well as international trade flows according to Mann (2002). Following Mann (2002), we investigated whether the current account is sustainable in the sense of the external debt solvency. Results of our empirical analysis are based on the sample period from the first quarter of 1960 to the fourth quarter of 2002 (Ogawa and Kudo 2004).

*Perspective on international trade flows*

In our empirical analysis based on international trade flows, we used current account data and classified this data into its main components such as exports, imports, and income accounts (that is represented by repayments of external debt) in terms of trade flows to investigate the sustainability of the US current account deficit. Repeatedly we analyzed not only the current account data but also some combinations of the components.

Stationarity of the current account deficit is the condition for sustainability of the current account – given that the sustainability of the current account

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[2] Kudo and Ogawa (2003) conclude that the US current account deficits are unsustainable from the three views suggested by Mann (2002), while Matsubayashi (2005) does not reject the hypothesis of the sustainability of the US current account deficits.

[3] See Ogawa (2004). Ogawa and Sakane (2006) identify the Chinese exchange rate policy after the announcement of the reform on July 21, 2005. Added to the regression shown by Frankel and Wei (1994), they employ the Kalman filter method. Ohno and Fukuda (2003) use the high frequency (intra-daily) data to exclude the correlated shocks among the currencies in the investigation.

deficit is defined as a situation where a current account deficit does not diverge from its current level but converges to this level. In this context we adopted a unit-root test to investigate whether the current account data in itself is converging. Moreover, we used a co-integration test to analyze whether some combinations of the major components mentioned above have a co-integrating relationship, i.e. a long-run stable converging relationship.[4] If a combination of the components has a co-integrating relationship, we can conclude that the current account deficit is sustainable.

Based on the analysis mentioned above, we investigated the sustainability of the US current account deficit. Our unit-root test delivered the result that the current account deficit has not a converging but a diverging tendency. In addition, most of the combinations of components did not suggest a co-integrating relationship, which means that they have no long-run stable converging relationships. Thus, these results showed that the US current account deficit is unsustainable from the perspective based on international trade flows.

*Perspective on the domestic saving-investment balance*

The same empirical exercise was carried out in Ogawa and Kudo (2004) based on the saving-investment balance. In this case, components like repayments of external debt, national gross savings, and national gross investments are taken into account. National gross savings are divided into private and government savings, and national gross investments are analogously classified into private and government investments. We could also produce data series of saving-investment balances of the private sector and the public sector.

We conducted the co-integration test regarding all of the combinations of savings and investments for the purpose of investigating the sustainability of the US current account deficit. The result of the co-integration test revealed that combinations of the components mentioned above have no co-integrating relationship, which means that the combinations

have no long-run stable converging relationship. Therefore, the US current account deficit appears to be not sustainable also in terms of savings and investments.

*Perspective on international capital flows*

Thirdly, we investigated which components of the international capital inflows finance the current account deficit in the long run. In our empirical analysis based on international capital flows, we divided capital flows into changes in foreign reserves, capital inflows and capital outflows, given that the current account corresponds to the relevant capital account. In the analysis on the items in the financial account, we used direct investment inflows, portfolio investment inflows, and other investment inflows, on the one hand, and direct investment outflows, portfolio investment outflows, and other investment outflows, on the other. In addition, we created data series on the direct investment balance, the portfolio investment balance, and other investment balance.

Again we conducted the co-integration test regarding all of the combinations of capital account components in order to examine the sustainability of the US current account deficit. The co-integration test confirmed that the combinations of components have no co-integrating relationships for all of the combinations of international capital flows to the United States. Therefore, it could be postulated that the current account deficit in the United States is not sustainable in terms of international capital flows.

*International capital flows finance the current account deficit*

We also carried out co-integration tests for the combination of the current account deficit and the financial balance, the results of which revealed – unlike the former cases – a general co-integrating relationship for the combination of the US current account deficit and the financial balance. Next, we decomposed the financial balance into the direct investment balance, the portfolio investment balance, and other investment balance. We found that there is a co-integrating relationship in the combination which includes the current account deficit and the portfolio investment balance. Accordingly, we concluded that the US current account deficit has been financed by portfolio investment inflows from foreign countries,

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[4] Noticing that the linear restriction which is described in the previous section is imposed on the co-integration vector, Miyao (2001) tests the co-integration by using the framework of the Engle-Granger test. Though he carries out a unit-root test on the series of repayments of external debt, imports, and exports, this is similar to carrying out the Engle-Granger test on the system of repayments of external debt, imports, and exports by imposing the restriction (1,1,–1) on the co-integration vector.

which, in turn, has kept the total balance of payments to show a long-run stable convergence to a level (Ogawa and Kudo 2004). In other words, the unsustainable current account deficit in the United States has been "stably" financed by capital inflows from foreign countries.

**Effects of the US dollar depreciation on the US current account deficit**

*VAR models and data*

Ogawa and Kudo (2007) investigated how the US dollar depreciation would affect the US current account deficit. In this context we simulated how much depreciation of the US dollar was needed for current account sustainability, given the estimated parameters of vector auto-regression (VAR) models. Three VAR models were estimated in our analysis. The first model (Model 1) is a "two variables VAR model" which contains the exchange rate and the current account. The second model (Model 2) is a "three variables VAR model" including the exchange rate, the trade balance, and factor income receipts from abroad from a viewpoint of international trade flows. The last model (Model 3) is another "three variables VAR model" which encompasses the exchange rate, saving-investment balances for the private and the public sectors from a viewpoint of domestic saving-investment balance.

The following data were used for the analysis. First, the log of the real effective exchange rate of the US dollar was adopted as one of the elements in the three VAR models. The real effective exchange rate data was taken from the Federal Reserve Board. Second, the trade balance and the income receipts from abroad were taken into consideration to investigate the view of international trade demonstrated by Mann (2002). These data were taken from the quarterly international transactions accounts released by the Bureau of Economic Analysis (BEA) of the US Department of Commerce. Third, the data of the saving-investment balances of the private and public sectors were taken from the national income and product accounts (NIPA), collected also by the BEA, to investigate the domestic saving-investment view according to Mann (2002). These data, except for the exchange rate, were normalized by GDP. The sample period of all data is from the first quarter of 1973 to the first quarter of 2006.
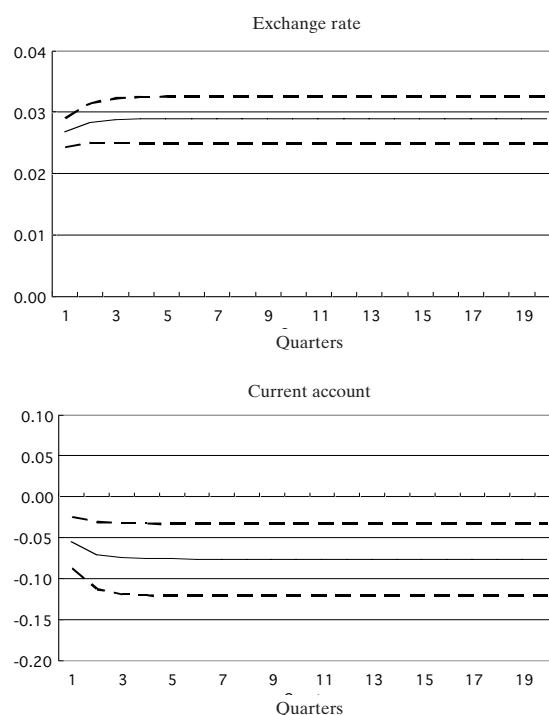
*Impulse responses to the exchange rate shocks*

Impulse responses to the exchange rate shock are obtained from the individually estimated VAR models. The impulse responses to the exchange rate shock in the first model are shown by Figure 4(a). If the initial exchange rate shock is an appreciation of about 2 percent, the exchange rate will appreciate by about 3 percent after twenty quarters and the current account will deteriorate by about 0.07 percent of GDP. Conversely, we can say that the 30 percent depreciation of the US dollar after twenty quarters of the initial shock improves the current account by 0.7 percent of GDP. This result is striking because the large depreciation, which equals the depreciation after the Plaza Accord, leads only to an improvement in the current account by 0.7 percent of GDP. This result means that we may need the largest depreciation in the history to return the US current account to a permissible level.

Figure 4(b) depicts the impulse responses to the same type of shock in the second model. Again, if there is an initial exchange rate shock of 2 percent appreciation as before, the exchange rate will appreciate by around 3 percent after twenty quarters,

**Figure 4**
**The Accumulated Impulse Responses to the Exchange Rate Shocks**

(a) Model 1: Exchange rate and Current account



Exchange rate



Current account

(b) Model 2: Exchange rate, Trade balance and Income receipt
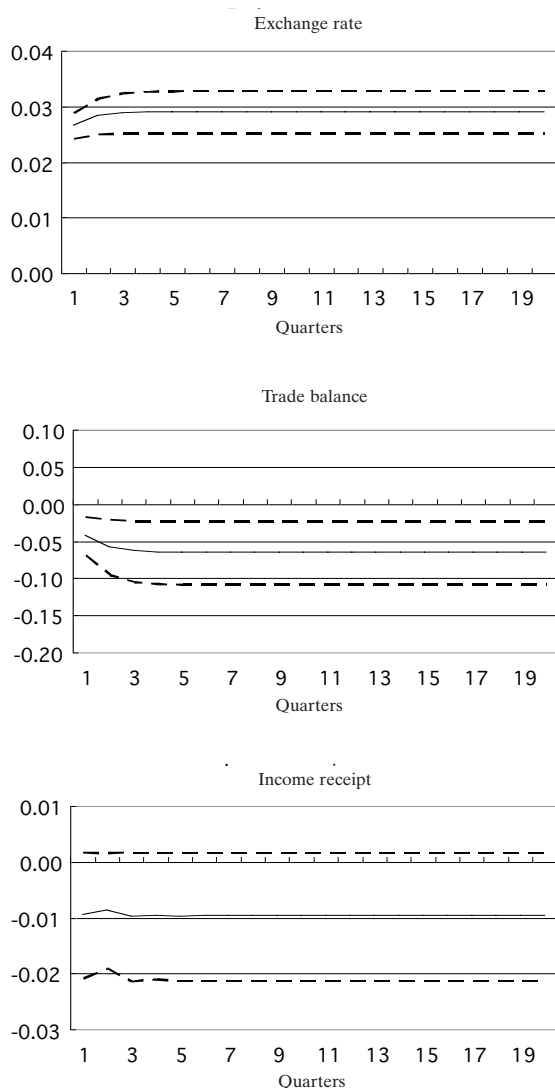
(c) Model 3: Exchange rate, IS balance (Private) and IS balance (Government)

Exchange rate

Exchange rate

Trade balance

IS balance (Private)

Income receipt

IS balance (Gorvernment)
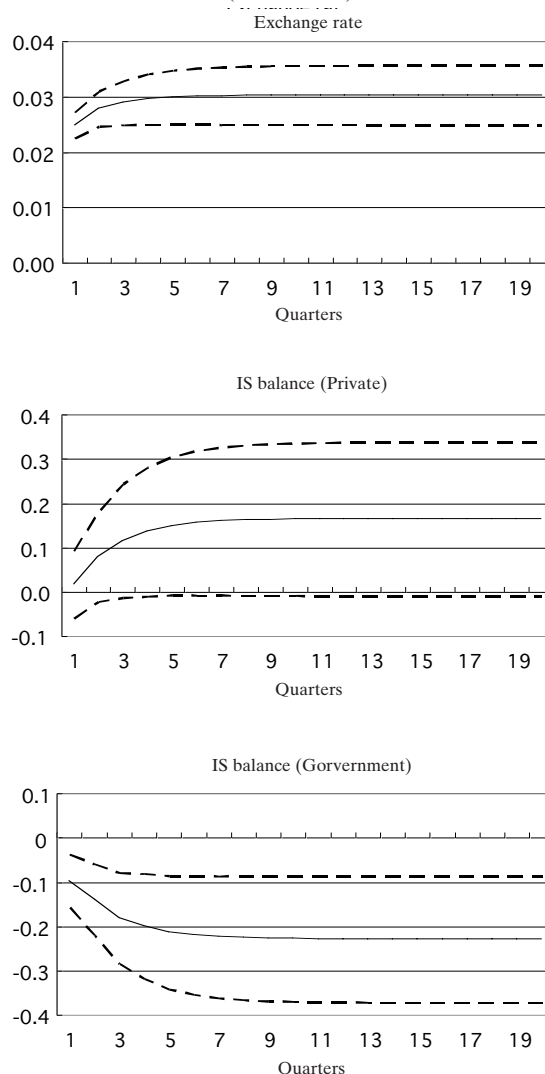
Notes: The initial shock is normalized to one standard error. The solid lines show the impulse responses, and the dashed lines show the one-standard deviation bands.

Source: Ogawa and Kudo (2007).

while the trade balance will deteriorate by about 0.07 percent of GDP and income receipts are expected to decrease by about 0.01 percent of GDP. The joint effect of the exchange rate shock on the current account remains the same as in the first model.

The calculation results of the third model are illustrated in Figure 4(c), which again suggests that the initial appreciation of the exchange rate by 2 percent leads to an appreciation of around 3 percent after twenty quarters. In addition, the saving-investment balance of the private sector will rise by about 0.17 percent of GDP, while that of the government sector will fall by about 0.23 percent of GDP. The joint effect of the exchange rate shock

on the current account is again the same as in the first model.

We conclude that it is inevitable for the US dollar to depreciate against other currencies including the East Asian currencies, and that this conclusion is robust because we are able to get the same results from the different models, whether from the view of international trade or the domestic saving-investment balance.

*Simulated dynamics of reducing the current account deficit of the United States*

Based on the above-mentioned three VAR models we further examined the extent to which a US dol-

lar depreciation is necessary to safeguard the country's current account sustainability (see also Ogawa and Kudo 2004). Here we summarize the results of simulation analyses regarding the dynamic effects of the US dollar depreciation on the US current account deficit in the case of the first model. We examined three hypothetical cases, where the real effective exchange rate of the US dollar depreciates against its trading partners' currencies by 10, 30 and 50 percent in the second quarter of 2004.

Figure 5(a) shows the current account behavior that is obtained by the simulation in the case where the US dollar depreciates by 10 percent in the second quarter of 2004. The 10 percent depreciation would gradually reduce the current account deficit to 2 percent of GDP by 2018. Figure 5(b) suggests that the 30 percent depreciation of the US dollar would reduce the current account deficit to 2 percent of GDP by 2011 and then to 1.6 percent of GDP in 2018. In the case that the US dollar sharply depreciates by 50 percent in the second quarter of 2004, a reduction of the current account deficit to 0.8 percent of GDP is expected by 2013.

**Conclusion**

This paper presents the empirical result that the current account deficit of the United Sates is unsustainable. It also shows how much the US dollar should be depreciated for reducing the US current account deficit. We conclude that some scenarios of US dollar depreciation would reduce the current account deficit to a level of under 2 percent of GDP in the next several years. The results were derived from VAR models by taking into account relationships between the current account and the exchange rate without exogenously reducing fiscal deficits. It is expected that a smaller depreciation of the US dollar would reduce

**Figure 5**
**Simulated Current Account in the United States**

(a) Case of 10% depreciation of the US dollar in 2004: Q2



— Actual Data    --- Simulated Data
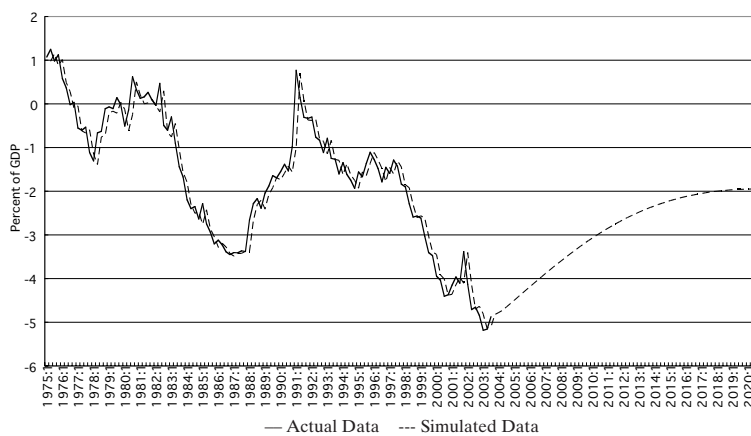
(b) Case of 30% depreciation of the US dollar in 2004: Q2



— Actual Data    --- Simulated Data
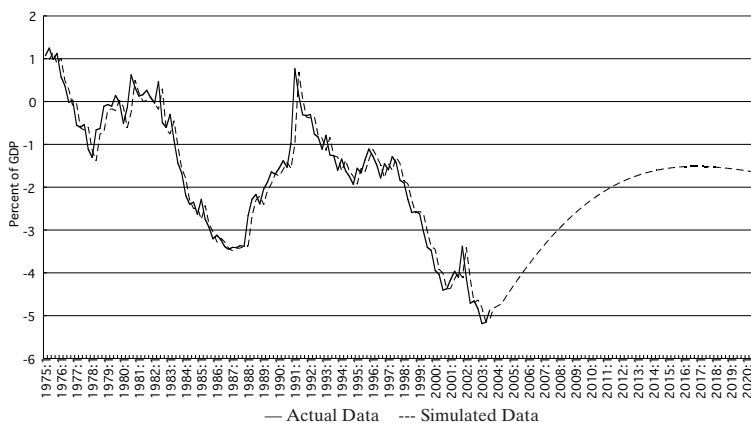
(c) Case of 50% depreciation of the US dollar in 2004: Q2



— Actual Data    --- Simulated Data

Source: Ogawa and Kudo (2004).

the current account deficit to the same level if the US government were to reduce the fiscal deficit at the same time.[5]

It is found that the responses of the other currencies to a sudden and sharp depreciation of the US dollar will differ from one country to another, because the linkages of some currencies to the US dollar are stronger compared with the euro and the Japanese yen. Especially, the Chinese yuan still has a very tight linkage to the US dollar while it is continuously revaluing against the US dollar at a relatively slower pace. Based on the above analyses, a more flexible exchange rate system appears to be necessary for countries with strong linkages to the US dollar to respond appropriately to a possible depreciation of the US dollar in the future. For example, Ogawa and Ito (2002) show that the dollar peg in the East Asian countries is a result of "coordination failure" in the choice of the exchange rate system among the East Asian countries. The monetary authority of China announced the reform of its exchange rate system which includes the adoption of a managed floating exchange rate system with reference to a currency basket on July 21, 2005. Implementation of the reform by the Chinese monetary authority should make sense for regional coordination in conducting exchange rate policies. The implementation might lead to a solution of the "coordination failure" in conducting exchange rate policies among the countries.

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[5] Another candidate of the adjustment channel of the current account is fiscal consolidation because the fiscal deficit is the element of the so-called "twin deficits". Kim and Roubini (2003) estimate the structural VAR and conclude that fiscal consolidation alone does not reduce the current account deficit.