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

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### 1. Introduction

The United States have been faced with the increasing current account deficit since the latter half of 1990s. The current account deficit has been recently recorded over 6 percent of GDP. We remember that the current account deficit was over 3 percent of GDP in the mid of 1980s when the US dollar made a large depreciation after the Plaza Accord in September 1985. It is regarded that the current account deficit in the recent years is going beyond a dangerous level by comparing the recent situation with that in the mid of 1980s.

Though the US dollar began to depreciate several months before the Plaza Accord, the depreciation of the US dollar gained momentum by the Plaza Accord. The real effective exchange rate of the US dollar depreciated nearly 40% from the peak in the early 1985 to the early 1988 as shown in Figure 1. Following the depreciation, the current account deficit was reduced from 3.4% in the last quarter of 1986 to 1.4% in the second quarter of 1990.

The current account can be decomposed to the trade balance, the net income receipt from abroad, and the unilateral current transfers, as shown in Figure 2. The trade balance has almost continuously deteriorated. The income receipt has been decreasing with a gentle slope, as the international investment position has been deteriorated<sup>1</sup>. The unilateral current transfers are stable except for the first quarter of

<sup>&</sup>lt;sup>1</sup> The Bureau of Economic Research reported that the United States has shifted from

1991 when the US was received the military transfers on the Gulf war from the allies.

Figure 3 shows the saving-investment balances for each of the private and government sectors. The private sector had excess savings almost all period till 1995 while the government had excess investments. Though 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 current account deficit in the United States is sustainable for the current exchange rate level of the US dollar because the current account deficit is increasing and have exceeded 6% of GDP<sup>2</sup>. Now, we might need the "Plaza Accord" once again. However, we have already observed the recent appreciations of the Euro, the Japanese yen, and some other currencies which 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.

This paper explains our empirical analytical results from Kudo and Ogawa (2003) and Ogawa and Kudo (2004) to show unsustainable current account deficit in the United States in the next section. In Section 3, we explain some results from a

the creditor to the debtor in 1986, in the case of the direct investment positions evaluated at current cost, or in 1989 at market value.

 $<sup>^2</sup>$  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.

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 were used to conduct the simulation analysis about impacts of hypothetical exchange rate movements on the current account deficit. In conclusion, we point out that the US dollar depreciation will have asymmetric effects on the other currencies, given fact-findings that some currencies are formally or *de facto* fixed to the US dollar.<sup>3</sup>

#### 2. 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) explained unsustainable current account deficit in the United States. We used the method of Bohn (1995) and Ahmed and Rogers (1995) in order to derive the necessary and sufficient conditions for sustainable current account deficit. The sustainability of the current account deficit in the United States was empirically analyzed from a perspective based on domestic investment-saving relationship or international capital flows as well as international trade flows according to Mann (2002). According to Mann (2002), we investigated whether the current account deficit is sustainable in the sense of the external debt solvency, given our empirical analysis (Ogawa and Kudo (2004))

<sup>&</sup>lt;sup>3</sup> 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 Frankel and Wei (1994)'s regression, 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.

during the sample period that covers from the first quarter of 1960 to the fourth quarter of 2002.

#### (1) Perspective on the international trade flows

In our empirical analysis based on international trade flows, we used current account data in itself and divide the current account data into its components such as exports, imports, and income accounts (that is represented by repayments for the external debts) in terms of trade flows to investigate sustainability of current account deficit. We analyzed not only 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 sustainability of the current account deficit is defined as a situation where a current account deficit does not diverge from a current level of current account deficit but converge to the level. We use some combinations of the component data of current accounts as well as the current account data in itself to investigate whether this condition is satisfied for the current account deficit in the United States. For the purpose, we use a unit-root test to analyze whether the current account data in itself is characteristic of converging into a level. Moreover, we use a cointegration test to analyze whether some combinations of the components have a conintegrating relationship, that is, a long-run stable converging relationship.<sup>4</sup> If a combination of the components has a cointegrating relationship, we can conclude that the current account deficit is sustainable.

Based on the above-mentioned analysis, we investigate the sustainability of the current account deficit. Our unit-root test obtained a result that the current account deficit has not a converging tendency but a diverging tendency. Most of the combinations of components have a cointegrating relationship, which means that they have no long-run stable converging relationships. Thus, these results show that the current account deficit in the United States is unsustainable from the perspective based on the international trade flows.

#### (2) Perspective on the domestic investment-saving balance

In our empirical analysis based on investment-saving balance, we can relate the current account with components which includes repayments for the external debts, national gross savings, and national gross investments. The national gross savings are divided into private savings and government savings while the national gross investments are divided into private investments and government investments. Also,

<sup>&</sup>lt;sup>4</sup> Noticing that the linear restriction which is described in previous section is imposed on the cointegration vector, Miyao (2001) tests the cointegration by using the framework of the Engle-Granger test. Though he carries out a unit-root test on the series of repayments for the external debts, imports, and exports, this is similar to carry out the Engle-Granger test on the system of repayments for the external debts, imports, and exports by imposing the restriction (1,1,-1) on the cointegration vector.

we can make data series of investment-saving balances of the private sector and the public sector.

We conducted the cointegration test regarding all of the combinations of savings and investments for sustainability of current account deficit in the United States to investigate whether the components of current account deficit have a cointegrating relationship, that is, a long-run stable converging relationship. The cointegration test cannot reject that combinations of the components have no cointegrating relationship, which means that the combinations have no long-run stable converging relationship. Therefore, the current account deficit in the United States is not sustainable in terms of savings and investments.

#### (3) Perspective on the international capital flows

Thirdly, we investigate which items in 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 change in foreign reserve, the capital inflows, and the capital outflows, given that a current account corresponds to the relevant capital account. In the analysis on the items in financial account, we use the direct investment inflow, the portfolio investment inflow, and the other investment inflow, and the direct investment outflow, the portfolio investment outflow, and the other investment outflow. In addition, we make data series on the direct investment balance, the portfolio investment balance, and the other investment balance.

We conducted the cointegration test regarding all of the combinations of capital account components for sustainability of current account deficit in the United States to investigate whether the components of current account deficit have a cointegrating relationship, that is, a long-run stable converging relationship. The cointegration test could not reject that the combinations of components have no cointegrating relationships for all of the combinations of international capital flows to the United States. Therefore, the current account deficit in the United States is not sustainable in terms of international capital flows.

#### (4) International capital flows finance the current account deficit

We also conduct cointegration tests for a combination of the current account deficit and the financial balance. We can find a cointegrating relationship for the combination that includes the current account deficit and the financial balance.

Next, we decomposed the financial balance into the direct investment balance, the portfolio investment balance, and the other investment balance to investigate whether some combination of the current account and financial account components. We found that there is a cointegrating relationship in the combination which includes the current account deficit and the portfolio investment balance. Accordingly, we can conclude that the current account deficit in the United States has been financed by the portfolio investment from foreign countries to keep a total of the balance of payments in the United States to have a long-run stable convergence to a level. In other words, the unsustainable current account deficit in the United States is stably financed by the capital inflows from foreign countries.

#### 3. Effects of the US dollar depreciation on the US current account deficit

#### (1) VAR models

Ogawa and Kudo (2007) investigated how impact depreciation of the US dollar would give on the current account deficit in the United States and how much depreciation of the US dollar is needed to reduce the current account deficit to a permissible level. It was simulated how much depreciation of the US dollar is needed for its current account sustainability given estimated parameters of vector autoregression (VAR) models.

Three VAR models are estimated in our analysis. The first model (Model 1) is a 2 variables VAR model which contains the exchange rate and the current account. The second model (Model 2) is a 3 variables VAR model which contains the exchange rate, trade balance, and factor income receipt from abroad from a viewpoint of international trade flows. The last model (Model 3) is a 3 variables VAR model which contains the exchange rate, saving-investment balances for the private and the public sectors from a viewpoint of domestic investment saving balance.

The following data were used for analysis. First, we use the log of the real effective exchange rate of the US dollar as one of the elements in the three VAR models. The real effective exchange rate data is taken from the Federal Reserve Board. Second, the trade balance and the net income receipt from abroad to investigate the view of international trade by Mann (2002). These data are taken from the Table 1 in the quarterly International Transactions Accounts released by the Bureau of Economic Research (BEA). Third, the data of the saving-investment balances of the private and public sectors is taken from the Table 4 in the National Income and Production Accounts (NIPA) by the BEA to investigate the view of domestic saving-investment view of Mann (2002). These data except for the exchange rate are normalized by the GDP which is taken from the Table 1 in the NIPA. The sample period of all data is from the first quarter of 1973 to the first quarter of 2006.

#### (2) Impulse responses to the exchange rate shocks

We estimate the three unrestricted VAR models in this analysis. Impulse responses to the exchange rate shock are obtained from the estimated VAR models in previous subsection. The impulse responses to the exchange rate shock in the first model are shown in panel (a) of Figure 4. If the exchange rate initially appreciates about 2% by the shock, the exchange rate will appreciate about 3%, and the current account will deteriorate about 0.07% of GDP after 20 quarters. Conversely, we can say that the 30% depreciation of the US dollar after 20 quarters of the initial shock improves the current account by 0.7% point.

This result strikes us because the large depreciation which equals to the depreciation after the Plaza Accord makes only the improvement in the current account by 0.7% of GDP. This result means that we may need the largest depreciation in the history to make the US current account to the permissible level.

The impulse responses to the exchange rate shock in the second model are shown in panel (b) of Figure 4. If the exchange rate initially appreciates about 2% by the shock, the exchange rate will appreciate about 3%, the trade balance will deteriorate about 0.07%, and the income receipt will decrease about 0.01% of GDP after 20 quarters. The joint effect of the exchange rate shock on the current account is as same as in the first model.

The impulse responses to the exchange rate shock in the third model are shown in panel (c) of Figure 4. If the exchange rate initially appreciates about 2% by the shock, the exchange rate will appreciate about 3%, the saving-investment balance of the private sector will rise about 0.17% of GDP, while that of the government sector will fall about 0.23% of GDP. The joint effect of the exchange rate shock on the current account is also as same as in the first model.

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

# (3) Simulated dynamics of reducing current account deficit in the United States

Ogawa and Kudo (2004) used the above three VAR models to simulate how much depreciation and how dynamics of the US dollar is needed for its current account sustainability. Here we show results of simulation analysis regarding dynamic effects of the US dollar depreciation on the current account deficit of the United Sates in the case of the Model 1 among the three models.

We supposed some cases of exchange rate movements in order to simulate their effects on the current account deficit. The supposed cases are that the US dollar will sharply depreciate in the second quarter of 2004. We supposed three cases where the US dollar will depreciate against its trading partners' currencies in terms of the real effective exchange rates by 10%, 30%, and 50% in the second quarter of 2004. In addition, we suppose two hypothetical movements of the exchange rate.

Panel (a) of Figure 5 shows a current account behavior that is obtained by the simulation analysis in the case where the US dollar sharply depreciates by 10% in the second quarter of 2004. The 10% depreciation would gradually reduce the current account deficit to 2% of GDP by 2018 in the simulation. Panel (b) of Figure 5 shows a

current account behavior that is obtained by the simulation analysis in the case where the US dollar sharply depreciates by 30% in the second quarter of 2004. The 30% depreciation would reduce the current account deficit to 2% of GDP by 2011 and then to 1.6% of GDP in 2018. Panel (c) of Figure 5 shows a current account behavior that is obtained by the simulation analysis in the case where the US dollar sharply depreciates by 50% in the second quarter of 2004. The 50% depreciation would reduce the current account deficit to 0.8% of GDP by 2013.

#### 4. Conclusion

This paper showed the empirical results that the current account deficit in the United Sates is unsustainable. Also it showed the empirical research that investigated how much the US dollar should be depreciated for reducing the current account deficit in the United States. We conclude that some scenarios of the US dollar depreciation would reduce the current account deficit to a level under 2% of GDP in the next several years. The results were derived from the VAR models by taking into account relationships between the current accounts and the exchange rates without exogenously reducing fiscal deficits. It is expected that smaller depreciation of the US dollar should reduce the current account deficit if the US government reduced the fiscal deficits at the same time. In other words, the US government should reduce the fiscal deficits in order that it should prevent a large depreciation of the US dollar for reducing the current account deficit and make them sustainable in the near future.<sup>5</sup>

It is found that the responses of the other currencies to a sudden and sharp depreciation of the US dollar will differ with countries because the linkages of some other currencies to the US dollar are stronger compared with the euro and the Japanese yen. Especially, the Chinese yuan still have very high linkages with the US dollar while it is everyday revaluing against the US dollar at relatively slower pace. The Chinese yuan is depreciating against the currencies that are appreciating against the US dollar at higher pace than the Chinese yuan.

Based on the above analyses, more flexible exchange rate system is necessary for the country with strong linkages with the US dollar to respond appropriately to a possible depreciation of the US dollar in the future. For example, Ogawa and Ito (2002) shows 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 its exchange rate system reform, which include

<sup>&</sup>lt;sup>5</sup> Another candidate of the adjustment channel of the current account is the fiscal consolidation because the fiscal deficit is the element of so-called "twin deficits". Kim and Roubini (2003) estimate the structural VAR and conclude that the fiscal consolidation does not bring the reduction of the current account deficits because the correlation between the fiscal balance and current account is negative.

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 the regional coordination in conducting exchange rate policies. The implementation might lead to solution of "coordination failure" in conducting exchange rate policies among the countries.

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Figure 1: US Current Account and the Real Effective Exchange Rate of the



US dollar

Data Source: Real Effective Exchange Rate (Federal Reserve Board of Governors)

Current Account (Bureau of Economic Analysis)



Figure 2: Decomposition of the US Current Account

Data Source: Bureau of Economic Analysis



Figure 3: The US Saving-Investment Balance

Data Source: Bureau of Economic Analysis

# Figure 4: The Accumulated Impulse Responses to the Exchange Rate Shocks



(a) Model 1: Exchange rate, and Current account







(b) Model 2: Exchange rate, Trade balance, and Income receipt

Exchange rate





Income receipt



(c) Model 3: Exchange rate, IS balance (Private), IS balance (Government)

1) Impulse responses to the exchange rate shock are from the VAR model in the table 5.

- 2) The initial shock is normalized to one standard error.
- 3) The solid lines show the impulse responses, and the dashed lines show the one-standard deviation bands.

Source: Ogawa and Kudo (2007)

#### Figure 5: Simulated Current Account in the United States

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



Figure 2:Sinulated Current Account Based on Model1 (Case 1:10% exchange rate depreciation in 20042)



## (b) Case of 30% depreciation of the US dollar in 2004:Q2 $\,$





Figure 8:S in u lated Current Account Based on Model1 (Case 3:50% exchange rate depreciation in 20042)

Source: Ogawa and Kudo (2004)