External Adjustments and Integration in Asia-Pacific*

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Abstract

This paper investigates how much realignment of currencies we need for adjustments to the current account imbalances if we rely only on exchange rate adjustments given other economic factors, such as the huge fiscal deficit in the United States, are kept unchanged. We used the two-variable VAR model to compare exchange rates adjustments to current account imbalances among the United States, Japan, and East Asia. Moreover, some VAR models are used to investigate adjustments of Japanese and East Asian current account surpluses against the United States through exchange rates in a situation of economic integration. Both analytical results were compared to consider effects of establishing production networks in East Asia by Japanese FDI to other East Asian countries and increasing intra-regional trade among East Asian countries under the globalization.

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1. Introduction

Global imbalances have been increasing in the recent years. The global imbalances have been led by the huge current account deficit of the United States. The United States has been faced with an increasing current account deficit since the latter half of 1990s. Its current account deficit stood recently at over 6% of GDP. The current level of the current account deficit is almost a double of the level (3%) which the United States experienced in mid-1980s when the US dollar was rapidly depreciated after the Plaza Accord in September 1985. In the situation, rest of the world as well as the United States is urged to solve the global imbalances.

Economic integration is globally developing further in forms of widening and deepening international trade, capital, and financial transactions. At the same time, the economic integration is developing further also inside of such regions as the European Union (EU) and East Asia. Especially in East Asia, further widening and deepening international trade induce intra-regional capital flows, which include foreign direct investments (FDI), to establish production networks in the manufactures such as automobile manufactures. Not only FDI but also international portfolio investments and international bank loans are increasing in the globalization.

The increases in FDI, international portfolio investments and international bank loans accumulate external assets in investor countries. The accumulation of external assets increases dividend and interest receipts from foreign countries as a part of income account in the current account. A share of income account in the current account has a tendency to increase in the case of the countries accumulating external asset. The tendency might decrease an adjustment effect of exchange rates on the current account through exports, imports, and trade account for the countries.

On one hand, the FDI’s establishing production networks increases international trade volumes of manufactured goods which include parts and semi-final goods as well as final goods. Also it makes international trade complex in the region. Thus, the economic integration seems to change responses of current account imbalances to exchange rates.

This paper has the following objectives. One of them is to investigate how much realignment of currencies we need for adjustments to the current account imbalances if we rely on only exchange rate adjustments given other economic factors such that a huge fiscal deficit in the United States are kept unchanged. We compare exchange rates adjustments among the United States, Japan, and East Asia because we find that movements in the current account deficits of the United States are parallel with those in the Japanese and East Asian current account surpluses.
The above analysis for the United States, Japan, and East Asia shows that the large realignments of the US dollar, the Japanese yen, and other East Asian currencies would be needed for the adjustments to the current account imbalances if we made the adjustment only with the exchange rates. Next, we investigate why it becomes more difficult to make the adjustment only with the exchange rates. It is supposed that elasticity of the current accounts against the exchange rates might have been decreasing over time. Or some factors such as the FDI’s increasing the part of income account surplus in the current account surplus might have been affecting the response of the current accounts to the exchange rates.

For the purpose, we investigate adjustments of the Japanese current account surplus through exchange rates by taking into account the economic integration. Moreover, it investigates adjustments of the East Asian currency account surplus to compare with the Japanese case by taking into account establishing production networks in East Asia by Japanese FDI to other East Asian countries and increasing intra-regional trade among East Asian countries.

This paper consists of the following sections. The next section looks at some data on Japanese current account to point out its characteristics. Section 3 explains the increasing current account deficit of the United States that has caused the global imbalance. Section 4 investigates how much realignment of currencies we need for adjustments to the current account imbalances given that other economic variables other than exchange rates are kept unchanged. We compare the analytical results among the United States, Japan, and East Asia. Section 5 supposes a two-country (Japan and the United States) model, which include interest rate differentials and so on between Japan and the United States as endogenous variables, to investigate effects of exchange rate on current account of Japan. Moreover, Section 6 supposes a two-country (East Asia and the United States) model, which include interest rate differentials between East Asia and the United States and so on as endogenous variables, to investigate effects of exchange rates on current account of East Asia. We compare the analytical result between Japanese and East Asian cases. In conclusion, we make concluding remarks.

2. Characteristics of Japanese Current Account

In this section, we look at data on Japanese current account and the related economic variables to draw characteristics of the Japanese current account. Figure 1 shows the Japanese current account and its composition which include trade account,
service account, and income account. It is found that the Japanese current account surplus has shown several large swings since 1985. In addition, they have an upward trend from 1996.

The Japanese trade account surplus has decreased since 2004 while Japanese economy has continuous increases in the income account surplus which is related with the accumulation of external net assets in such background that Japanese economy has been conducting FDI as well as international portfolio investments to foreign countries, especially neighboring countries in East Asia. In addition, the Japanese service account deficit has decreased since 2002. The current account surplus has been increasing because the increase in income account surplus is larger than the decrease in trade account surplus. This is a typical phenomenon which shows increasing a share of income account in the current account. It might diminish effects of exchange rate on current account through exports, imports, and trade account.

The accumulation of external net assets, which include foreign direct investments as well as international portfolio investments, is related with the decreases in domestic capital formation. Figure 2 shows the decreases in domestic capital formation. It implies that Japanese firms have been shifting their production to foreign countries which include East Asian countries. The increase in current account surplus is affected by the decrease in domestic capital formulation. Consumption by household and government has not decreased recently as shown in Figure 2.

Figure 3 shows movements in private sector’s savings-investments and public sector’s savings-investments, that is, fiscal deficits compared with the Japanese current account in terms of their ratio to GDP. The private sector’s savings-investments as well as the fiscal deficit have tendency to decrease since 1995. Both of the tendencies have been offset to have no significant effects on Japanese current account in terms of trend. Figure 4 shows decomposition of the private sector’s savings-investments into private sector’s savings and private sector’s investments. The private sector’s investments had decreased during 1990s but it has been increasing since 2002. On one hand, the private sector’s savings had decreased since 1990s but it has turned to increase since 2005. Figure 5 shows decomposition of the fiscal deficit into public sector’s incomes and public sector’s expenditures. The increase in public sector’s incomes decreased the fiscal deficits from 2002 to 2004 while decrease in public sector’s expenditures contributed to the decrease in fiscal deficits from 2002 to 2006.

3. Current Account Deficit of the United States in the Global Imbalance
The huge current account deficit of the United States is the most important factor in the current global imbalance. We look at data on the current account deficit of the United States and the related economic variables in this section. Figure 6 shows the current account deficits (a ratio in terms of GDP) of the United States and the real effective exchange rate of the US dollar. The current account deficit was over 3% of GDP in the mid-1980s when the Plaza Accord in September 1985 gained momentum of its depreciation that started several months before the Plaza Accord. The current account deficit again has been increasing since the beginning of the 1990s. On one hand, the US dollar was appreciating in the latter half of 1990s and it has been depreciating since 2002.

Figure 7 shows decomposition of the current account of the United States. The current account is decomposed into the trade account, net income receipts from abroad and unilateral current transfers. The trade balance has almost continuously deteriorated. Income receipts have been decreasing along a gentle trend as international investment position deteriorated.

Figure 8 shows the savings-investments balances for each for the private and government sectors. The private sector had excess saving 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.

Many researchers investigated sustainability of the current account deficit of the United States. Among them, Ogawa and Kudo (2007a, b), used the methodology of Bohn (1995) and Ahmed and Rogers (1995) in order to derive the necessary and sufficient conditions for a sustainable current account deficits. In this context, the sustainability of the current account deficit was empirically analyzed from a perspective based on the domestic investments-savings relationship or international capital flows as well as international trade flows according to Mann (2002). Following Mann (2002), Ogawa and Kudo (2007a, b) investigated whether the current account is sustainable in the sense of the external debt solvency. The analytical results showed unsustainability of the current account deficit of the United States. However, the current account deficit of the United States has been financed by the portfolio investment inflows from rest of the world. For the reason, the total balance of payments of the United States shows sustainability even though the current account deficit is unsustainable.

On the other hand, it is pointed out that the current account deficit of the United States corresponds to Japan, China, and East Asia. Moreover, Bernanke pointed out that the current global imbalance should be attributed to excess savings in East Asia.
look at data to compare the current account surpluses of Japan and East Asia with the current account deficit of the United States. Figure 9 shows that the movements in current account deficit (ratio in terms of GDP) of the United States have been parallel with those in the current account surpluses (ratios in terms of GDP) of Japan and East Asia. In the next section, we investigate exchange rate adjustments to their current account imbalances while comparing Japan and East Asia.

4. How much realignments of currencies are necessary for adjustments to current account imbalances?

In this section, we investigate how much realignment of currencies for adjustments to current account imbalances for each of the United States, Japan, and East Asia. As for the United States, we investigate how much depreciation of the US dollar is necessary to reduce the current account deficits of the United States from a current level (6% of GDP) to its half level (3% of GDP). Next, as for Japan, we investigate how much appreciation of the Japanese yen is necessary to reduce the Japanese current account surplus from a current level (4% of GDP) to its half level (2% of GDP). Finally, as for East Asia, we investigate how much appreciation of East Asian currencies is necessary to reduce the current account surplus of East Asia from a current level (3% of GDP) by 2% points that is the same change (% points) as Japan.

We investigate how much change in real effective exchange rate of the currencies would affect the relevant current account by using the following methodology. A two-variable vector-autoregressive (VAR) model is used to estimate parameters of the VAR model. The estimated VAR model is used to make simulation of how much depreciation or appreciation of the currencies are needed for reducing the relevant current account imbalances. The two-variable VAR contains logarithm differential of exchange rate of the relevant currency and a ratio of current account in terms of GDP of the relevant country. The estimated 2-variable VAR model is used to analyze impulse responses of the current account to an exchange rate shock as well as those of the exchange rate to a current account shock.

Regarding data for the analysis, a real effective exchange rate of the US dollar is used as an exchange rate while current account of the United States against rest of the world that is normalized by GDP is used as a current account in the case of the United States. Also in the case of Japan, a real effective exchange rate of the Japanese yen is used as an exchange rate while current account of Japan against rest of the world that is normalized by GDP is used as a current account. In the case of East Asia, a weighted
average of exchange rate of East Asian currencies in terms of a currency basket of the US dollar and the euro as major trading partners for East Asia is used as an exchange rate while a sum of current accounts of East Asian countries against rest of the world that is normalized by a sum of GDP of East Asian countries is used as a current account. Here, East Asian countries include eight countries (Japan, China, Korea, Singapore, Malaysia, Indonesia, the Philippines, and Thailand).

Data on Asian Monetary Unit (AMU)\(^1\) is available as a weighted average of exchange rate of East Asian currencies. The real exchange rate of a currency basket of the US dollar and the euro in terms of the AMU is used for the analysis. Shares on the US dollar and the euro are based on trade (exports + imports) share of East Asia with the United States and the euro area (65%:35%). On one hand, weights on composite East Asian currencies for the weighted average of East Asian currencies are based on intraregional trade shares and shares of GDP measured at the purchasing power parity (PPP).

An analytical sample period covers a period from 1977Q1 to 2006Q4 for the United States and Japan. On one hand, an analytical sample period for East Asia covers a period from 1991Q1 to 2006Q4 due to a data constraint, that is, lack of Chinese CPI data.

The analytical results are as follows. In the case of exchange rate adjustment to the current account deficit of the United State against rest of the world, Figure 10 shows that an exogenous 1% depreciation of the US dollar yields 19.94% depreciation of the US dollar and 1.26% point decreases in the current account deficit of the United States in 50 quarters (about 4 years). It means that 1.26% point of improvement in the current account deficit of the United States needs about 20% depreciation of the US dollar during 50 quarters (about 4 years). Thus, we can conclude that a significant depreciation of the US dollar (about 45% during 4 years) is needed in order to reduce the current account deficit of the United States from the current level (6%) to its half level (3%).

In the case of exchange rate adjustment to the current account surplus of the Japan against rest of the world, Figure 11 shows that an exogenous 1% appreciation of the Japanese yen yields 11.72% appreciation of the Japanese yen and 0.34% point decrease in the Japanese current account surplus in 50 quarters (about 4 years). It means that 0.34% point of decrease in the Japanese current account surplus needs about 12% appreciation of the Japanese yen during 50 quarters (about 4 years). We can conclude that a significant appreciation of the Japanese yen (about 70% during 4 years)

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is needed in order to reduce the Japanese current account surplus from the current level (4%) to its half level (2%) by 2% point.

In the case of exchange rate adjustment to the current account surplus of the East Asia against rest of the world, Figure 12 shows that an exogenous 1% appreciation of real exchange rate of AMU against a currency basket of the US dollar and the euro yields 10.72% appreciation of the AMU and 0.33% point decrease in the current account surplus of East Asia in 50 quarters (about 4 years). It means that 0.33% point of decrease in the current account surplus of East Asia needs about 11% appreciation of the AMU against the currency basket of the US dollar and the euro during 50 quarters (about 4 years). We can conclude that a significant appreciation of the AMU (about 66% during 4 years) is needed in order to reduce the current account surplus of East Asia from the current level (3%) to a level (1%) by the same 2% point with the above Japanese case.

5. Adjustments of Japanese current account surplus

In this section, we investigate adjustments of Japanese current account surplus by supposing that economic variables related with both Japan and the United States such as interest rate differentials between Japan and the United States in order to take into account adjustments of Japanese current account surplus against the current account deficit of the United States. For the purpose, VAR models are used to analyze causality relationships among the current account of Japan and the related economic variables. The estimated VAR models are used to investigate adjustments of Japanese current account surplus. We suppose a two-country (Japan and the United States) model to analyze effects of exchange rates on current account of Japan in order to investigate adjustments of Japanese current account surplus against the current account deficit of the United States. Moreover, we take into account representative factors of globalization. Under the current globalization, Japanese firms are increasing FDI to neighboring countries in East Asia to establish cross-boarder supply chains and production network. In addition, capital flows become more sensitive to international interest rate differentials and relative stock prices under the current globalization. We put such economic variables as FDI/investments, interest rate differentials, and relative stock prices into the VAR models.

We use two kinds of VAR model to estimate parameters of the VAR models and then to make simulation of how much change in real effective exchange rate of the currencies are needed for improvements of the relevant current accounts. One of the two
VAR models is a four-variable VAR model (Model J1) which includes interest rates differential between Japan and the United States, logarithm of relative stock prices between Japan and the United States, logarithm of real effective exchange rate of the Japanese yen, and a ratio of Japanese current account in terms of GDP. The other one is a five-variable VAR model (Model J2) which includes interest rates differential between Japan and the United States, a ratio of Japanese outward FDI in terms of domestic investment, logarithm of real effective exchange rate of the Japanese yen, a ratio of Japanese income account in terms of current account, and a ratio of Japanese current account in terms of GDP.

Our analytical sample period covers from 1977Q1 to 2006Q4. The whole sample period is divided into two sub-sample periods (the first period from 1977Q1 to 1990Q4 and the second period from 1991Q1 to 2006Q4) in order to investigate changes in elasticity of current account to exchange rate. We have another reason for dividing the sample period into the two sub-sample periods is the different causes of current account between the two periods. The current account imbalance was resulted from the fiscal deficits of the United States and the expansionary monetary policy in Japan before 1990, while the current account imbalance has been resulted from the higher growth of productivity in the United States and the lower aggregate demand in Japan since 1991.

The analytical results are as follows. In the case of Model J1, the effect of the exchange rate on the current account is weak but the effect of the current account on the exchange rate is strong. An increase in relative stock prices leads to the current account surplus during the first period from 1977Q1 to 1990Q4 as shown in Figure 13. On the other hand, the effect of the exchange rate on the current account becomes stronger while the reverse causality effect does weaker during the second period from 1991Q1 to 2006Q4 as shown in Figure 14. An increase in relative stock prices has no impact on the current account surplus. The effect of the exchange rate on the current account is weak during the first period from 1977Q1 to 1990Q4, but the effect of the current account on the exchange rate is strong. An appreciation of the Japanese yen leads to the Japanese current account surplus, which is somewhat puzzling but what we have seen.

During the second period from 1991Q1 to 2006Q4, the effect of the real effective exchange rate of the Japanese yen on the Japanese current account becomes stronger. A depreciation of the Japanese yen leads to the Japanese current account surplus. On the other hand, the effect of the current account on the exchange rate becomes insignificant. The increase in relative stock prices has a positive effect on the current account during the first period from 1977Q1 to 1990Q4, but does not during the second period from 1991Q1 to 2006Q4. This indicates that the saving increased by increases in relative
stock prices is greater than the wealth effect and the investment effect. This effect is no longer detected recently.

In the case of Model 2, the ratio of FDI in terms of domestic investment increases the ratio of income account in terms of current account and the current account during the first period from 1977Q1 to 1990Q4 as shown in Figure 15. The appreciation of the Japanese yen contributes to increase in the FDI during the first half of period. On the other hand, the relationship among FDI, income account, and current account can be seen. However, the exchange rate is no longer a strong determinant of the FDI during the second period from 1991Q1 to 2006Q4 as shown in Figure 16. Japanese FDI positively affected the income account and the current account surplus. This effect is significant throughout the sample period. An appreciation of the Japanese yen had an impact on FDI during the first period from 1977Q1 to 1990Q4 while it had no impact on FDI during the second period from 1991Q1 to 2006Q4.

6. Adjustments of East Asian current account surplus

In the previous section, it is found that effects on the Japanese current account surplus were significant during the first period from 1978 to 1990. However, Japanese firms have conducted FDI to other East Asian countries to establish production network in East Asia since 1980s. Accordingly, not Japan but East Asia seem to have significant effects on the current account in the United States after 1990. For the reason, we investigate adjustment of East Asian current account to take into account establishing production network in East Asia in this section. Also in this section, we suppose that economic variables related with both East Asia and the United States such as interest rate differentials between East Asia and the United States in order to take into account adjustments of East Asian current account surplus against the current account deficit of the United States.

Also in this section, we use two kinds of VAR model to estimate parameters of the VAR models and then to make simulation of how much change in real effective exchange rate of the currencies are needed for improvements of the relevant current accounts. One of the two VAR models is a three-variable VAR model (Model EA1) which includes interest rates differentials between East Asia and the United States, logarithm of real exchange rate of the AMU in terms of a currency basket composed of the US dollar and the euro, and a ratio of East Asian current account in terms of GDP. The other one is a four-variable VAR model (Model EA2) which includes interest rates differentials between East Asian and the United States, logarithm of real exchange rate of the AMU
in terms of a currency basket composed of the US dollar and the euro, logarithm of relative stock prices between East Asia and the United States, and a ratio of East Asian current account in terms of GDP. Here, East Asian countries include eight countries (Japan, China, Korea, Singapore, Malaysia, Indonesia, the Philippines, and Thailand).

An analytical sample period for East Asia covers a period from 1991Q1 to 2006Q4 due to data constraint, that is, lack of Chinese CPI data.

The analytical results are as follows. In the case of Model EA1, the real appreciation of the AMU against the currency basket of the US dollar and the euro decreases current account surplus of East Asia while the increase in current account surplus leads to the real depreciation of the AMU against the currency basket of the US dollar and the euro during the period from 1991Q1 to 2006Q4. The real exchange rate of the AMU and the current account has a feedback causality relationship, which is consistent with the standard elasticity approach. In the case of Model EA2, an increase in the relative stock prices decreases the current account surplus. The effect of exchange rate on the current account and the effect of exchange rate on the current account are no longer clearly seen. An increase in relative stock prices decreases the East Asian current account surplus, which is consistent with the wealth effect and the investment effect. Thus, our hypotheses are basically supported.

7. Conclusion

This paper investigated how much realignment of currencies we need for adjustments to the current account imbalances if we rely only on exchange rate adjustments given other economic factors, such as the huge fiscal deficit in the United States, are kept unchanged. We used the two-variable VAR model to compare exchange rates adjustments to current account imbalances among the United States, Japan, and East Asia. Moreover, some VAR models are used to investigate adjustments of Japanese and East Asian current account surpluses against the United States through exchange rates in a situation of economic integration. Both analytical results were compared to consider effects of establishing production networks in East Asia by Japanese FDI to other East Asian countries and increasing intra-regional trade among East Asian countries under the globalization.

A large depreciation of the US dollar is necessary to significantly decrease the current account deficit of the United States, given the current fiscal deficits of the United States. Also, East Asian currencies are enforced to accompany with the large depreciation of the US dollar.
Increases in Japanese current account surplus are caused by increases in its income account surplus in the recent years rather than the trade account surplus. The income account surplus is closely related with FDI and accumulation of external assets. The exchange rate adjustment is no longer promising in the recent years to contribute to decreasing the Japanese current account surplus.

The VAR analysis for Japanese current account surplus showed that the Japanese economy has a mechanism that increase in the Japanese outward FDI/domestic investment increase the Japanese current account surplus through increase in the income account surplus. Especially since 1990s, the FDI has a tendency to increase independently of the exchange rate movement of the Japanese yen. As the result, the Japanese economy has an increasing structural part of the Japanese current account which does not respond to the exchange rate movement. It implies there may be a less room for the exchange rate to adjust the Japanese current account imbalances.

The current wide-spreading subprime loan problem seems to have an effect on adjustments to the US current account deficit due to the reductions of private residential investment and consumption in the United States. If the changes in the aggregate demand make adjustments to the current account of the United States and, in turn, depreciate the US dollar against the Japanese yen and other East Asian currencies, the required exchange rate changes should be smaller than our empirical results resulting from the exogenous exchange rate changes ( "Soft-landing scenario" )

However, the solution of the global imbalance might be delayed if the reduction of the consumption in the United States and the appreciation of the Japanese yen and other East Asian currencies cool down the Japanese and other East Asian economies. Accordingly, further coordination of macroeconomic policy should be desired among the US, Japan, and other East Asian countries to avoid the hard the hard-landing scenario.

References


Figure 1: Japanese Current Account and its Composition

Japanese Current Account Decomposition

- Current Account
- Trade Balance
- Services
- Income Account

Figure 2: Japanese Demand Decomposition

Japanese Demand Decomposition

- House Cons.
- Gov. Cons.
- Gross Fix. Capital Form.
- Change in Inventory

1974-2006

(%)
Figure 3: Private Savings-Investments, Fiscal Deficit, and Net Export in Japan

Private S-I, fiscal deficit, and net export
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(S-I)/ Y
S/Y
I/Y
NX/Y
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-8 -6 -4 -2 0 2 4 6 8

Percent of GDP

Private
Government

Figure 9: Current Account/GDP of US, Japan, and East Asia
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Figure 11: Impulse Responses to Exchange Rate and Current Account Shocks in Japan

Response to Generalized One S.D. Innovations ± 2 S.E.

Response of LOG_REER_JAP to LOG_REER_JAP

Response of LOG_REER_JAP to CURRENT_GDP_JAP

Response of CURRENT_GDP_JAP to LOG_REER_JAP

Response of CURRENT_GDP_JAP to CURRENT_GDP_JAP
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Figure 18: Impulse Responses to the shocks in East Asia, Model EA2, 1991Q1-2006Q4