# Regional Monetary Cooperation in East Asia against Asymmetric Responses to the US Dollar Depreciation*

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Abstract

In this paper we consider a regional monetary cooperation in East Asia after we look at recent movements of exchange rates of East Asian currencies and exchange rate policies in East Asian countries. We regard that the recent movements of exchange rates have been related with their reactions to the US dollar depreciation that has been caused by the current account deficit of the United States and changes in capital flows between the United States and the rest of the world. We found that East Asian currencies were classified into at least two groups; one group's currencies have been appreciated against the US dollar while the other's currencies have been pegged to the US dollar. We stress coordination failure in exchange rate policies among East Asian countries that causes biased change in exchange rates among the intra-regional currencies. It is necessary to make regional coordination in exchange rate policies for a desirable exchange rate system in East Asia. At last, we suggest some policy recommendations related with regional cooperation in exchange rate policies in East Asia.

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## 1. Introduction

In recent years, the United States have increased the current account deficit and depreciated the US dollar in a situation where decelerated huge capital inflows to the United States. The depreciation of the US dollar has led to appreciation of other currencies which include the euro and the Japanese yen. However, we can find asymmetric responses to the US dollar depreciation among East Asian currencies, which is caused by different choice of exchange rate systems; floating exchange rate system, managed floating exchange rate system, and dollar pegging system. The asymmetric responses of East Asian countries should bias relative prices of products made in East Asian countries and misallocate resources among the East Asian countries.

In this paper we consider a regional monetary cooperation in East Asia after we look at recent movements of exchange rates of East Asian currencies and exchange rate policies in East Asian countries. We regard that the recent movements of exchange rates have been related with their reactions to the US dollar depreciation that has been caused by the current account deficit of the United States and changes in capital flows between the United States and the rest of the world. We found that East Asian currencies were classified into at least two groups; one group's currencies have been appreciated against the US dollar while the other's currencies have been pegged to the US dollar. We stress coordination failure in exchange rate policies among East Asian countries that causes biased change in exchange rates among the intra-regional currencies. It is necessary to make regional coordination in exchange rate policies for a desirable exchange rate system in East Asia. At last, we suggest some policy recommendations related with regional cooperation in exchange rate policies in East Asia.

## 2. Empirical Analysis on linkages of East Asian currencies with the US dollar

At first, we should look at the IMF's classification for exchange rate systems in East Asian countries because movements in exchange rates depend on what kind of exchange rate system the monetary authorities are adopting. According to the IMF's classification in 2003, Japan, Korea, and the Philippines are adopting a floating exchange rate system. Indonesia, Singapore, Thailand, Cambodia, Myanmar, Lao, and Vietnam are adopting a managed floating exchange rate system. It is China and Malaysia that are adopting a fixed exchange rate system, especially pegging their home currencies to the US dollar. Hong Kong and Brunei are adopting a currency board

system. Hong Kong is pegging its home currency to the US dollar while Brunei is pegging its home currency to the Singapore dollar. Thus, we can classify the East Asian countries' exchange rate systems into three groups; a floating group, a managed floating group, and a fixed (dollar pegging) group. The adopted exchange rate system might determine degree of linkages of each of the currencies with the US dollar.

Next, an empirical analysis is conducted to investigate how much degree of linkages each of the East Asian currencies actually have with the US dollar. For the purpose, the empirical analytical method of Frankel and Wei (1994) is to analyze the linkages of some of the East Asian currencies to the US dollar.[1] It is covered the ASEAN5 countries (Thailand, Malaysia, Singapore, Indonesia, the Philippines), China, Korea, Hong Kong, and Taiwan. The empirical analysis estimates coefficients placed on the three major currencies (the US dollar, the Japanese yen, and the euro) for each of the East Asian currencies. According to Frankel and Wei (1994), it is supposed that the Swiss franc as a numere in denomination of exchange rates. Daily data of exchange rates are used to regress log differences of a local currency (in terms of the Swiss franc) on log differences of the three major currencies (in terms of the Swiss franc) for each quarter of the sample period from 1999 to 2003. The regression for each quarter of the sample period from 1999 to 2003 is to investigate dynamics of coefficients on the three major currencies during the period.[2]

The regression equation is the following one:

$$\Delta \log e^{home/SFR} = a_0 + a_1 \Delta \log e^{USD/SFR} + a_2 \Delta \log e^{JPY/SFR} + a_3 \Delta \log e^{euro/SFR} + \varepsilon_t$$

where $e^{home/SFR}$ : exchange rate of a home currency in terms of the Swiss franc, $e^{USD/SFR}$ : exchange rate of the US dollar a home currency in terms of the Swiss franc, $e^{JPY/SFR}$ : exchange rate of the Japanese yen in terms of the Swiss franc, $e^{euro/SFR}$ : exchange rate of the euro in terms of the Swiss franc.

Tables 1.1 to 1.9 show results of the regression for each of the East Asian currencies. It is proved that coefficients on the US dollar are nearly equal to a unity for all of the East Asian countries over time. On one hand, coefficients on the Japanese yen and the euro are very small and statistically insignificant in many cases though we

[1] Kawai and Akiyama (1998, 2000) conducted the method to investigate exchange rate policy of East Asian countries.
[2] McKinnon (2002) and Ogawa (2002a) conducted the similar method to investigate the dynamics of the coefficients.

found several significant coefficients on the Japanese yen in the case of the Singapore dollar, the Korean won, and the Taiwan dollar.

Figures 1.1 to 1.9 focus on the coefficient on the US dollar to summarize the regression results as shown in Tables 1.1 to 1.9. A solid line in the figures represents estimates of the coefficients for each quarter of the sample period. Broken lines represent estimates plus or minus 2 times standard deviations of the coefficients. A band between the two broken lines means a statistically significant interval at about 95%.

Figure 1.1 shows movements of the coefficient on the US dollar for the Thai baht. The coefficients were nearly equal to a unity although they have decreased from a unity since the 4th quarter of 2002. Figure 1.2 shows movements of coefficients on the US dollar for the Singapore dollar. The coefficients are about 0.8 from 1999 to 2001 although they are not significantly equal to a unity almost during the period. The coefficients on the US dollar have decreased from since the 2nd quarter of 2002. Figure 1.3 shows movements of coefficients on the US dollar for the Korean won. The coefficients on the US dollar are nearly equal to a unity in 1999 and 2000. After that they have decreased and significantly different from a unity for some of the periods. The three figures show that the Thai baht, the Singapore dollar, and the Korean won have the similar characteristics for the coefficients on the US dollar during the sample period.

Figure 1.4 shows movements of coefficients on the US dollar for the Philippine peso. The coefficients have kept a similar level during a sample period from 1999 to 2003. Figure 1.5 shows movements of coefficients on the US dollar for the Indonesia rupiah. The coefficients have kept a similar level during a sample period from 1999 to 2003 while the standard deviations have decreased. The decreases in the standard errors imply that the Indonesia rupiah has more stable linkages with the US dollar in recent years.

Figure 1.6 shows movements of coefficients on the US dollar for the Malaysian ringgit. The Malaysian ringgit has been formally pegging to the US dollar under the fixed exchange rate system. The coefficients on the US dollar always equal to a unity during the sample period. It is characteristic that the standard errors of the coefficient are very small. Figure 1.7 shows movements of coefficients on the US dollar for the Hong Kong dollar. The Hong Kong dollar also has been formally pegging to the US dollar under the currency board system. The coefficients on the US dollar always equal to a unity during the sample period while the standard errors of the coefficient are very small. Figure 1.8 shows movements of coefficients on the US dollar for the Chinese yuan.

The Chinese yuan has the same characteristics for the coefficient on the US dollar as the Malaysian ringgit and the Hong Kong dollar. The coefficients on the US dollar always equal to a unity during the sample period while the standard errors of the coefficient are very small. The last three figures shows that the Malaysian ringgit, the Hong Kong dollar, and the Chinese yuan has the same characteristics for the coefficients on the US dollar

3. Unsustainable current account deficit of the United States and depreciation of the US dollar

Next, I explain a relationship between the current account deficit of the United States and the depreciation of the US dollar by focusing on sustainability of the current account deficit and capital flows to or out of the United States. The recent empirical analyses (Kudo and Ogawa (2003)) used three approaches (domestic investment-saving relationship, international trade flows, and international capital flows) of Mann (2002) to investigate unsustainability of the current account deficit of the United States. They obtained a result that the current account deficit of the United States was not sustainable from the perspectives based on both the domestic investment-saving relationships and the international trade flows. This means that the rapid growth in the current account deficit from the mid of 1990s together with the worsening international investment position has not satisfied the external "budget constraint" of the United States. However, the current account deficit of the United States has been financed by the international capital inflows. In this sense, the balance of payments as a whole has been sustainable. In other words, the portfolio investments into the United States finance the current account deficit of the United States.

Figure 2 shows the movements of the current account deficit of the United States during a period from 1960 to 2003. In the mid of 1980s, the United States economy faced the so-called twin deficits, fiscal and current account deficit, which was one of the hottest policy issues in the world economy. The ratio of the current account deficit to GDP was over 3%. The fiscal deficit was cut down by the long-term boom and political efforts during the 1990s. As a result, the federal government budget turned to surplus in 2000. On one hand, the current account deficit was decreasing till 1990. However, it was increasing and approached the level that was higher than in the mid of 1980s. In the recent year, the ratio of the current account deficit to GDP has been over 5% and approached the level that was higher than in the mid of 1980s

Figure 3 shows both gross capital inflows to the United States from the rest of the world and EU and gross capital outflows from the United States to the rest of the

world and EU. We can find that the gross capital inflows to the United States were increasing from 1995 to 2001. However, the gross capital inflows made a sudden drop in 2001 and have been decreasing. We can find that the decrease in the gross capital inflows contribute to decreases in capital inflows from Europe if we look at another data classified by regions. Of course, the gross capital outflows are smaller in volume than the gross capital inflows because net capital inflows should correspond to the current account deficit of the United States. We can find similar movements that the gross capital outflow from the United States was increasing from 1995 to 2001 and that the gross capital outflows made a sudden drop in 2001 and have been decreasing.We found that the gross capital inflows to the United States have been decreasing since 2001. If the recent changes in the capital inflows to the United States, especially the decreases in the capital inflows into the United States from European countries, were structural and persistent, the current account deficit of the United States would not be financed by the capital inflows any longer. The current account deficit of the United States would never be financed by the capital inflows if the United States made structural changes in the capital inflows. The United States' economy would make the current account deficit unsustainable and might face a balance of payment crisis. The balance of payment crisis would take a form of large depreciation of the US dollar.

Ogawa and Kudo (2004) conducted a simulation analysis to investigate how much depreciation of the US dollar is needed to reduce the current account deficit in the near future. Three VAR models were used to estimate relationships between the exchange rate of the US dollar and the current accounts in the United States. The first VAR model (Model 1) was a two-variable VAR that contains the exchange rate and the current account. In the second model (Model 2), we decompose the current account into the trade balance and the income receipt. On the other hand, from a viewpoint of the domestic investment saving balance, the third VAR model (Model 3) contains the exchange rate and the saving-investment balances for the private and the public sectors. Then the estimated VAR models were used to conduct the simulation analysis about impacts of hypothetical exchange rate movements on the current account deficit. In Ogawa and Kudo (2004) it was supposed several scenarios of exchange rate movements; 10%, 30%, and 50% of depreciation of the US dollar in the second quarter in 2004.

In the case where the US dollar were sharply depreciated by 10% in the second quarter of 2004, the depreciation would gradually reduce the current account deficit to 2% of GDP by 2018 in the cases of Models 1 and 2 (Figures 4.1 and 4.2). On one hand, it would reduce the current account deficit to 2% of GDP by 2008 (Figure 4.3). Next, in the case where the US dollar were sharply depreciated by 30% in the second quarter of 2004,

the depreciation would reduce the current account deficit to 2% of GDP by 2011 and then to 1.6% of GDP in 2018 in the cases of Models 1 and 2 (Figures 5.1 and 5.2). On one hand, it would reduce the current account deficit to 1.3% of GDP in 2008 and then increase it to 2.5% in 2020 in the case of Model 3 (Figure 5.3). In the case where the US dollar were sharply depreciated by 50% in the second quarter of 2004, the depreciation would reduce the current account deficit to 0.8% of GDP by 2013 in the case of Model 1 (Figure 6.1) and to 1% of GDP by 2015 in the case of Model 2 (Figure 6.2). On one hand, it would reduce the current account deficit to 0.5% of GDP in 2008 and then increase it to 2.8% in 2020 in the case of Model 3 (Figure 6.3).

4. Asymmetric Reaction of East Asian currencies to the depreciation of the US dollar

The rest of the world should react to the depreciation of the US dollar. When we look around the movements of exchange rates of the East Asian currencies, we find asymmetric reaction to the US dollar depreciation. The Japanese yen has appreciated against the US dollar since 2002. Also the Korean won, the Thai baht, and the Singapore dollar have appreciated against the US dollar since 2002 together with the Japanese yen though they have depreciated against the Japanese yen recently. The Indonesia rupiah has appreciated against the US dollar and the Japanese yen while the Philippine peso has depreciated against the US dollar and the Japanese yen. The Chinese yuan, Hong Kong dollar, and the Malaysian ringgit have pegged to the US dollar. They have depreciated against Japanese yen after 2002 because the US dollar depreciated against the Japanese yen.

One group of the countries that adopt the floating or managed floating exchange rate system faces their home currencies' appreciation against the US dollar since 2002. The group includes Japan, Korea, Thailand, and Singapore. The other group consists of countries that adopt officially or *de facto* fix their home currencies to the US dollar. The group includes Malaysia, Hong Kong, and China. Their exchange rates have been fixed against the US dollar in recent years. On one hand, they have been depreciating against the currencies of the former group countries, Japanese yen, Korean won, Thai baht, and Singapore dollar due to the depreciation of the US dollar since 2002. Thus, the dollar pegging currencies carry all the stress from the depreciation of the US dollar to the more flexible exchange rate regime adopting currencies. The asymmetric reaction of the East Asian currencies to the depreciation of the US dollar should bias relative prices of products made in East Asian countries.

Ogawa and Ito (2002) pointed out possibilities of coordination failure in choosing exchange rate system and exchange rate policy in a game theoretical

framework as long as one country's choosing the dollar peg system has an adverse effect on others' choosing their own exchange rate system through relative price effects. Ogawa (2002b) conducted an empirical analysis on whether the dollar pegging currencies gave adverse effects on other East Asian countries' choice of exchange rate system and exchange rate policy. They choose not a desirable exchange rate system but the *de facto* dollar peg system because the dollar pegging countries keep adopting official or *de facto* dollar peg systems. In other words, the monetary authorities in East Asian countries face coordination failure in choosing desirable exchange rate system among East Asian countries. Accordingly, it is clear that we should make regional coordination for a desirable exchange rate regime instead of the formal or the *de facto* dollar peg system.

It is suggested that the dollar pegging countries should adopt more flexible system such as an intermediate exchange rate system that consists both currency basket and exchange rate band. The more flexible system means not a free floating exchange rate system but an intermediate exchange rate system that is locate between the free floating exchange rate system and the dollar peg system. It is to suggest that an intermediate exchange rate system that consists both currency basket and exchange rate band.

First, under the currency basket system, the monetary authorities should target not the US dollar but a currency basket, that is composite of the US dollar, the Japanese yen, and the euro from a viewpoint of international trade partners and FDI. East Asian countries have strong economic relationship in terms of trade, FDI, and international finance with each other and European countries as well as the United States. Second, under the exchange rate band system, the monetary authorities should set a band in which the exchange rates are free floating without any intervention in the foreign exchange market. The exchange rate band can afford room for domestic monetary policy to the monetary authorities.

East Asian countries have strong economic relationships with each other within the intra-region as well as the United States and European countries. It is desirable for East Asian countries to stabilize exchange rates among the intra-regional currencies and to stabilize their exchange rates against outside currencies such as the US dollar and the euro. The monetary authorities of East Asian countries coordinate their exchange rate policy to their exchange rates against the outside currencies in order to stabilize both intra-regional exchange rates and their exchange rate with outside currencies at the same time. They should care about not only the US dollar and

the euro but also the Japanese yen because Japan has a larger portion in intra-regional economic relation.

## 5. Regional monetary cooperation in East Asia

The asymmetric reaction of the East Asian currencies to the depreciation of the US dollar should bias relative prices of products made in East Asian countries. The monetary authorities of East Asian countries should prevent from the biased changes in the relative prices caused by the US dollar depreciation under the different exchange rate systems in East Asian countries. For the purpose, they have to make coordination in choosing their exchange rate systems and exchange rate policies.

Kawai, Ogawa, and Ito (2004) suggested the following three points of policy recommendation related with the exchange rate policy in East Asia.

First, the monetary authorities of the ASEAN+3 should discuss the exchange rate issue as a part of the surveillance process. They should focus on the exchange rate issue as well as domestic macroeconomic policies and soundness of financial sector because exchange rates of home currency against neighbor countries' currencies are related with its terms of trade and its price competitiveness. Each country in the East Asia region has strong economic relationships with the other intra-regional countries as well as the United States and the European countries. Exchange rates among the intra-regional currencies should affect economic activities in each country of East Asia through intra-regional trade, investments, and finance. The monetary authorities should make surveillance over not only movements of the exchange rates but also their deviations from the regional averages and, in turn, their exchange rate policy in itself.

The surveillance process, in itself, might not be so robust in keeping regional policy coordination in the long run because the monetary authorities in each of the countries do not have any commitments to the policy coordination. They may make limited contribution to the policy coordination. It is necessary to have a mechanism that will be robust in keeping regional coordination in the long run by obliging the monetary authorities to have a commitment to the regional policy coordination. For the regional policy coordination, it is necessary to make all the monetary authorities in the region agree on an arrangement to create a regional common unit of account that consists of a basket of regional currencies. They might make a commitment to follow the regional common unit of account in conducting their exchange rate policy. It is desirable to create the regional common unit of account consisted of a basket of regional currencies that monetary authorities of East Asian countries should refer to when they make regional policy coordination for their exchange rate policies with each other. For the purpose, it is

to introduce a regional common unit of account (Asian Monetary Unit; AMU) in East Asia. One way to do this is to construct a common currency basket that includes regional currencies of the ASEAN+3 countries.

We have learnt that the monetary authorities should not *de facto* peg their home currencies to the US dollar from the lesson that *de facto* dollar-pegging countries experienced the Asian currency crisis. It is desirable for the emerging market economies in East Asia to stabilize exchange rates in terms of a G-3 currency basket (the US dollar, the euro, and the Japanese yen) because they have strong economic relationships with not only the United States but also Japan and European countries. We may call targeting the G-3 currency basket as a G-3 currency basket system. The monetary authorities of the regional emerging economy countries should use their G-3 currency baskets as a common currency basket in order that they should avoid a coordination failure in choosing their exchange rate policy and exchange rate system. When the regional emerging market economies adopt a common G-3 currency basket arrangement based on the Japanese yen, the US dollar and the euro, the AMU will also become a *de facto* basket of the G-3 currencies. This will create a zone of currency stability within East Asia. In addition, regional currency arrangements to target their home currencies to the common G-3 currency basket will help prevent competitive devaluation among the currencies in a region because the monetary authorities have a commitment to the arrangements.

## 6. Conclusion

The various exchange rate systems in East Asian countries have brought about the asymmetric response to the US dollar depreciation. Especially the dollar pegging currencies have co-moved with the US dollar and, on one hand, have depreciated against the floating and managed floating East Asian currencies. The US dollar depreciation under the various exchange rate systems have biased the relative prices of products among the East Asian countries. The various exchange rate systems in East Asia might be caused by coordination failure in choosing exchange rate system among the monetary authorities of the East Asian countries. It is necessary for the monetary authorities of the East Asian countries to solve the coordination failure.

In this paper, we suggest some policy recommendations related with solving the coordination failure in choosing the exchange rate systems among East Asia countries. First, the monetary authorities of the ASEAN+3 should discuss the exchange rate issue as a part of the surveillance process. Second, for the regional policy coordination, it is necessary to make all the monetary authorities in the region agree on

an arrangement to create a regional common unit of account that consists of a basket of regional currencies (Asian Monetary Unit (AMU)). Third, it is desirable for the emerging market economies in East Asia to stabilize exchange rates in terms of a common G-3 currency basket (the US dollar, the euro, and the Japanese yen) because they have strong economic relationships with not only the United States but also Japan and European countries.

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Table 1.1 Thailand baht

| Period | Constant | | US. dollar | | Lapanese yen | | Euro | | Adj.R-squared | D.W. Stat. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1999/1Q | 0.0006 | | 0.9277 | *** | 0.2726 | *** | -0.0165 | | 0.7447 | 1.8898 |
| | (0.0006) | | (0.1165) | | (0.0612) | | (0.1184) | | | |
| 1999/2Q | -0.0003 | | 0.8698 | *** | 0.1668 | *** | 0.0319 | | 0.7267 | 1.9950 |
| | (0.0004) | | (0.0945) | | (0.0625) | | (0.0993) | | | |
| 1999/3Q | 0.0018 | *** | 0.8615 | *** | 0.0747 | | -0.1012 | | 0.5506 | 2.0237 |
| | (0.0007) | | (0.1224) | | (0.0818) | | (0.1348) | | | |
| 1999/4Q | -0.0015 | * | 0.6946 | *** | 0.0651 | | 0.1920 | | 0.2746 | 1.8942 |
| | (0.0009) | | (0.2015) | | (0.1354) | | (0.2651) | | | |
| 2000/1Q | 0.0001 | | 0.8062 | *** | 0.1630 | ** | 0.0219 | | 0.7361 | 2.3080 |
| | (0.0005) | | (0.1093) | | (0.0702) | | (0.1152) | | | |
| 2000/2Q | 0.0005 | | 0.8799 | *** | 0.0808 | | 0.1497 | ** | 0.8271 | 2.2026 |
| | (0.0004) | | (0.0761) | | (0.0521) | | (0.0675) | | | |
| 2000/3Q | 0.0011 | * | 0.7714 | *** | 0.2648 | | -0.0968 | | 0.7148 | 2.0717 |
| | (0.0006) | | (0.1660) | | (0.1258) | | (0.1285) | | | |
| 2000/4Q | 0.0005 | | 0.7630 | *** | 0.0975 | | 0.1569 | | 0.5497 | 1.8920 |
| | (0.0007) | | (0.1598) | | (0.1588) | | (0.0995) | | | |
| 2001/1Q | 0.0001 | | 0.7012 | *** | 0.3078 | *** | 0.0032 | | 0.8358 | 1.7816 |
| | (0.0004) | | (0.0882) | | (0.0633) | | (0.0613) | | | |
| 2001/2Q | 0.0002 | | 0.9455 | *** | 0.1340 | | 0.0432 | | 0.8711 | 2.3731 |
| | (0.0003) | | (0.0741) | | (0.0535) | | (0.0657) | | | |
| 2001/3Q | -0.0003 | | 0.9081 | *** | 0.1354 | | 0.0625 | | 0.8911 | 1.9652 |
| | (0.0003) | | (0.0598) | | (0.0589) | | (0.0592) | | | |
| 2001/4Q | -0.0004 | * | 0.8381 | *** | 0.2339 | *** | 0.0501 | | 0.8963 | 1.8441 |
| | (0.0002) | | (0.0528) | | (0.0575) | | (0.0525) | | | |
| 2002/1Q | -0.0003 | | 0.8135 | *** | 0.2125 | *** | 0.0184 | | 0.9064 | 2.0222 |
| | (0.0002) | | (0.0460) | | (0.0302) | | (0.0543) | | | |
| 2002/2Q | -0.0005 | | 0.8642 | *** | 0.0974 | | -0.0710 | | 0.8995 | 1.6585 |
| | (0.0002) | | (0.0481) | | (0.0451) | | (0.0508) | | | |
| 2002/3Q | 0.0006 | | 0.4072 | *** | 0.2396 | | 0.2734 | *** | 0.6414 | 2.0984 |
| | (0.0004) | | (0.0704) | | (0.0948) | | (0.0849) | | | |
| 2002/4Q | 0.0001 | | 0.7154 | *** | 0.2721 | *** | - | | 0.7317 | 1.8438 |
| | (0.0003) | | (0.0710) | | (0.0654) | | - | | | |
| 2003/1Q | -0.0001 | | 0.7212 | *** | 0.2572 | *** | -0.0018 | | 0.9001 | 2.0624 |
| | (0.0002) | | (0.0458) | | (0.0521) | | (0.0506) | | | |
| 2003/2Q | -0.0004 | | 0.7646 | *** | 0.1815 | *** | -0.0321 | | 0.8940 | 1.9204 |
| | (0.0002) | | (0.0496) | | (0.0614) | | (0.0458) | | | |
| 2003/3Q | -0.0005 | | 0.7514 | *** | 0.2612 | *** | 0.0667 | | 0.8734 | 2.4610 |
| | (0.0003) | | (0.0708) | | (0.0641) | | (0.0630) | | | |
| 2003/4Q | 0.0000 | | 0.8475 | *** | 0.1700 | | -0.1127 | | 0.8190 | 1.9557 |
| | (0.0004) | | (0.0768) | | (0.0727) | | (0.0876) | | | |

All are calculated by author.

1) Daily Foreign exchange data are from Datastream.

2) Estimated coefficients (standard errors) are calculated by OLS of Frankel and Wei Model.

3) ***. ** and * indicate that the estimated coefficients are statistically significant at the 1%, 5% and 10% levels, respectively.

4) If the sign of estimated coefficient is minus and statistically significant, we remove such explanatory variable from OLS model and re-estimated the coefficients. We denote (-) in the column of removed explanatory variable.

Table 1.2 Singapore dollar

| Period | Constant | US dollar | | Japanese yen | | Euro | | Adj.R squared | D.W. Stat. |
|---|---|---|---|---|---|---|---|---|---|
| 1999/1Q | 0.0005 | 0.8311 | *** | 0.1820 | *** | 0.0193 | | 0.8756 | 1.6526 |
| | (0.0003) | (0.0642) | | (0.0337) | | (0.0652) | | | |
| 1999/2Q | -0.0003 | 0.7177 | *** | 0.2420 | *** | 0.1133 | | 0.7647 | 1.7144 |
| | (0.0003) | (0.0820) | | (0.0542) | | (0.0862) | | | |
| 1999/3Q | 0.0001 | 0.8209 | *** | 0.0473 | | 0.0930 | | 0.8145 | 2.4338 |
| | (0.0004) | (0.0659) | | (0.0440) | | (0.0726) | | | |
| 1999/4Q | -0.0003 | 0.9080 | *** | 0.0645 | | 0.0990 | | 0.8361 | 1.8949 |
| | (0.0003) | (0.0721) | | (0.0484) | | (0.0949) | | | |
| 2000/1Q | 0.0004 | 0.7874 | *** | 0.1289 | *** | -0.0450 | | 0.8634 | 2.1339 |
| | (0.0003) | (0.0674) | | (0.0433) | | (0.0710) | | | |
| 2000/2Q | 0.0001 | 0.9061 | *** | 0.1065 | *** | 0.0560 | | 0.9334 | 1.5493 |
| | (0.0002) | (0.0456) | | (0.0313) | | (0.0405) | | | |
| 2000/3Q | 0.0001 | 0.8980 | *** | 0.0863 | * | -0.0187 | | 0.9371 | 1.7814 |
| | (0.0002) | (0.0637) | | (0.0483) | | (0.0493) | | | |
| 2000/4Q | -0.0001 | 0.7840 | *** | 0.1138 | * | 0.0173 | | 0.8982 | 2.2664 |
| | (0.0003) | (0.0591) | | (0.0587) | | (0.0368) | | | |
| 2001/1Q | 0.0003 | 0.7958 | *** | 0.1715 | *** | 0.0076 | | 0.9352 | 2.1639 |
| | (0.0002) | (0.0493) | | (0.0353) | | (0.0342) | | | |
| 2001/2Q | 0.0002 | 0.8330 | *** | 0.2123 | *** | 0.0056 | | 0.9316 | 1.8110 |
| | (0.0002) | (0.0506) | | (0.0365) | | (0.0448) | | | |
| 2001/3Q | -0.0003 | 0.7521 | *** | 0.3034 | *** | -0.0169 | | 0.8269 | 1.8173 |
| | (0.0004) | (0.0730) | | (0.0718) | | (0.0722) | | | |
| 2001/4Q | 0.0004 | 0.7856 | *** | 0.2150 | *** | -0.0651 | | 0.8350 | 1.7347 |
| | (0.0003) | (0.0745) | | (0.0811) | | (0.0740) | | | |
| 2002/1Q | 0.0000 | 0.8253 | *** | 0.2185 | *** | -0.0298 | | 0.8876 | 2.0077 |
| | (0.0002) | (0.0513) | | (0.0337) | | (0.0606) | | | |
| 2002/2Q | -0.0002 | 0.7244 | *** | 0.1938 | *** | -0.0418 | | 0.8845 | 2.0052 |
| | (0.0002) | (0.0473) | | (0.0443) | | (0.0499) | | | |
| 2002/3Q | 0.0000 | 0.5717 | *** | 0.3395 | *** | 0.0851 | * | 0.9083 | 2.1985 |
| | (0.0002) | (0.0355) | | (0.0478) | | (0.0429) | | | |
| 2002/4Q | -0.0002 | 0.6646 | *** | 0.3490 | *** | - | | 0.8039 | 2.1633 |
| | (0.0003) | (0.0587) | | (0.0541) | | - | | | |
| 2003/1Q | 0.0003 | 0.6283 | *** | 0.2705 | *** | -0.0011 | | 0.8815 | 2.4863 |
| | (0.0002) | (0.0456) | | (0.0518) | | (0.0503) | | | |
| 2003/2Q | -0.0001 | 0.6087 | *** | 0.3463 | *** | -0.0263 | | 0.8033 | 2.0454 |
| | (0.0003) | (0.0660) | | (0.0817) | | (0.0610) | | | |
| 2003/3Q | 0.0000 | 0.6749 | *** | 0.2540 | *** | 0.0049 | | 0.8984 | 2.1127 |
| | (0.0002) | (0.0565) | | (0.0511) | | (0.0503) | | | |
| 2003/4Q | -0.0001 | 0.7718 | *** | 0.1786 | *** | -0.0403 | | 0.8822 | 2.2893 |
| | (0.0003) | (0.0572) | | (0.0541) | | (0.0652) | | | |

All are calculated by author.

1) Daily Foreign exchange data are from Datastream.

2) Estimated coefficients (standard errors) are calculated by OLS of Frankel and Wei Model.

3) ***. ** and * indicate that the estimated coefficients are statistically significant at the 1%, 5% and 10% levels, respectively.

4) If the sign of estimated coefficient is minus and statistically significant, we remove such explanatory variable from OLS model and re-estimated the coefficients. We denote (-) in the column of removed explanatory variable.

Table 1.3 Korean won

| Period | Constant | | US dollar | | Japanese yen | | Euro | | Adj.R squared | D.W. Stat. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1999/1Q | 0.0003 | | 0.7869 | *** | 0.1138 | | 0.0712 | | 0.5167 | 1.4690 |
| | (0.0007) | | (0.1480) | | (0.0777) | | (0.1503) | | | |
| 1999/2Q | -0.0010 | ** | 0.8374 | *** | 0.1160 | | 0.0590 | | 0.6276 | 1.7070 |
| | (0.0005) | | (0.1096) | | (0.0725) | | (0.1153) | | | |
| 1999/3Q | 0.0008 | * | 1.0431 | *** | 0.0436 | | -0.0376 | | 0.8222 | 1.7578 |
| | (0.0004) | | (0.0764) | | (0.0511) | | (0.0842) | | | |
| 1999/4Q | -0.0011 | ** | 1.0476 | *** | -0.0593 | | -0.0293 | | 0.7099 | 1.8425 |
| | (0.0005) | | (0.1044) | | (0.0701) | | (0.1374) | | | |
| 2000/1Q | -0.0003 | | 0.9777 | *** | 0.1105 | | 0.0376 | | 0.7648 | 2.1142 |
| | (0.0005) | | (0.1122) | | (0.0721) | | (0.1183) | | | |
| 2000/2Q | 0.0001 | | 1.0533 | *** | 0.0038 | | 0.0721 | | 0.8774 | 1.4670 |
| | (0.0003) | | (0.0671) | | (0.0460) | | (0.0596) | | | |
| 2000/3Q | 0.0000 | | 0.9559 | *** | 0.0828 | | -0.0352 | | 0.8871 | 1.7586 |
| | (0.0003) | | (0.0920) | | (0.0697) | | (0.0712) | | | |
| 2000/4Q | 0.0014 | *** | 1.0860 | *** | 0.2292 | | 0.0253 | | 0.7371 | 1.6949 |
| | (0.0007) | | (0.1517) | | (0.1507) | | (0.0944) | | | |
| 2001/1Q | 0.0002 | | 0.6504 | *** | 0.4344 | *** | 0.0867 | | 0.7123 | 2.5123 |
| | (0.0007) | | (0.1413) | | (0.1014) | | (0.0981) | | | |
| 2001/2Q | -0.0002 | | 0.5974 | *** | 0.5129 | *** | 0.1635 | | 0.6895 | 1.9999 |
| | (0.0006) | | (0.1452) | | (0.1049) | | (0.1288) | | | |
| 2001/3Q | 0.0000 | | 1.0617 | *** | 0.0632 | | -0.0456 | | 0.8234 | 2.3670 |
| | (0.0005) | | (0.0844) | | (0.0831) | | (0.0835) | | | |
| 2001/4Q | -0.0004 | | 0.7922 | *** | 0.3275 | ** | 0.0052 | | 0.8317 | 1.6847 |
| | (0.0005) | | (0.1134) | | (0.1235) | | (0.1127) | | | |
| 2002/1Q | 0.0002 | | 0.9573 | *** | 0.2030 | *** | -0.1092 | | 0.8135 | 2.0499 |
| | (0.0003) | | (0.0756) | | (0.0497) | | (0.0894) | | | |
| 2002/2Q | -0.0011 | *** | 0.7794 | *** | 0.1020 | | 0.0494 | | 0.7522 | 2.4151 |
| | (0.0004) | | (0.0806) | | (0.0756) | | (0.0851) | | | |
| 2002/3Q | 0.0003 | | 0.4912 | *** | 0.1757 | * | 0.1578 | * | 0.5966 | 1.8833 |
| | (0.0005) | | (0.0763) | | (0.1027) | | (0.0921) | | | |
| 2002/4Q | -0.0003 | | 0.5259 | *** | 0.3797 | *** | - | | 0.4309 | 2.3555 |
| | (0.0005) | | (0.1192) | | (0.1099) | | - | | | |
| 2003/1Q | 0.0008 | | 0.8238 | *** | 0.1834 | | -0.2063 | | 0.4996 | 2.0750 |
| | (0.0007) | | (0.1372) | | (0.1562) | | (0.1517) | | | |
| 2003/2Q | -0.0009 | | 0.8614 | *** | 0.2283 | | -0.1147 | | 0.6641 | 2.2835 |
| | (0.0006) | | (0.1134) | | (0.1403) | | (0.1048) | | | |
| 2003/3Q | -0.0003 | | 0.7330 | *** | 0.2479 | *** | 0.0176 | | 0.8724 | 2.5463 |
| | (0.0003) | | (0.0681) | | (0.0616) | | (0.0606) | | | |
| 2003/4Q | 0.0007 | | 0.8176 | *** | 0.1584 | | 0.0578 | | 0.7248 | 2.0492 |
| | (0.0005) | | (0.1031) | | (0.0975) | | (0.1175) | | | |

All are calculated by author.

1) Daily Foreign exchange data are from Datastream.

2) Estimated coefficients (standard errors) are calculated by OLS of Frankel and Wei Model.

3) ***. ** and * indicate that the estimated coefficients are statistically significant at the 1%, 5% and 10% levels, respectively.

4) If the sign of estimated coefficient is minus and statistically significant, we remove such explanatory variable from OLS model and re-estimated the coefficients. We denote (-) in the column of removed explanatory variable.

Table 1.4 Philippine peso

| Period | Constant | | US dollar | | Japanese yen | | Euro | Adj.R squared | D.W. Stat. |
|---|---|---|---|---|---|---|---|---|---|
| 1999/1Q | 0.0003 | | 1.0406 | *** | 0.3073 | *** | −0.1471 | 0.6410 | 2.2632 |
| | (0.0008) | | (0.1581) | | (0.0830) | | (0.1606) | | |
| 1999/2Q | −0.0003 | | 0.8964 | *** | 0.0865 | | 0.0499 | 0.7562 | 2.2955 |
| | (0.0004) | | (0.0838) | | (0.0554) | | (0.0881) | | |
| 1999/3Q | 0.0012 | ** | 0.9611 | *** | 0.0406 | | −0.1072 | 0.7288 | 2.2623 |
| | (0.0005) | | (0.0899) | | (0.0601) | | (0.0990) | | |
| 1999/4Q | −0.0003 | | 1.0233 | *** | −0.0360 | | 0.0742 | 0.6536 | 1.9629 |
| | (0.0005) | | (0.1199) | | (0.0806) | | (0.1578) | | |
| 2000/1Q | 0.0003 | | 0.9379 | *** | 0.0658 | | −0.0578 | 0.8276 | 2.0968 |
| | (0.0004) | | (0.0831) | | (0.0534) | | (0.0876) | | |
| 2000/2Q | 0.0008 | ** | 0.9364 | *** | 0.0198 | | 0.0285 | 0.8380 | 0.9761 |
| | (0.0003) | | (0.0705) | | (0.0483) | | (0.0626) | | |
| 2000/3Q | 0.0011 | ** | 1.0832 | *** | −0.0425 | | −0.1122 | 0.8218 | 1.9548 |
| | (0.0004) | | (0.1162) | | (0.0881) | | (0.0900) | | |
| 2000/4Q | 0.0016 | | 1.1210 | *** | −0.2512 | | 0.0164 | 0.2392 | 2.1979 |
| | (0.0014) | | (0.3118) | | (0.3098) | | (0.1941) | | |
| 2001/1Q | −0.0001 | | 1.1903 | *** | 0.2375 | | 0.1251 | 0.2956 | 1.9569 |
| | (0.0020) | | (0.4132) | | (0.2964) | | (0.2870) | | |
| 2001/2Q | 0.0009 | * | 0.8525 | *** | 0.2252 | ** | −0.0553 | 0.6929 | 2.0159 |
| | (0.0006) | | (0.1254) | | (0.0905) | | (0.1112) | | |
| 2001/3Q | −0.0002 | | 0.8639 | *** | 0.1312 | | −0.0047 | 0.7276 | 1.2741 |
| | (0.0006) | | (0.0967) | | (0.0952) | | (0.0957) | | |
| 2001/4Q | 0.0000 | | 0.9261 | *** | 0.0138 | | 0.0637 | 0.7403 | 2.0127 |
| | (0.0004) | | (0.0875) | | (0.0953) | | (0.0870) | | |
| 2002/1Q | −0.0002 | | 0.9156 | *** | 0.0873 | ** | −0.0447 | 0.8344 | 2.9142 |
| | (0.0002) | | (0.0620) | | (0.0407) | | (0.0732) | | |
| 2002/2Q | −0.0001 | | 0.9359 | *** | −0.0700 | | 0.0239 | 0.7391 | 1.6281 |
| | (0.0004) | | (0.0911) | | (0.0854) | | (0.0961) | | |
| 2002/3Q | 0.0006 | * | 0.7350 | *** | 0.0500 | | 0.1443 | 0.8586 | 2.1992 |
| | (0.0003) | | (0.0496) | | (0.0667) | | (0.0598) | | |
| 2002/4Q | 0.0003 | | 0.9251 | *** | 0.1000 | | −0.0426 | 0.7358 | 2.4549 |
| | (0.0003) | | (0.0894) | | (0.0712) | | (0.1032) | | |
| 2003/1Q | 0.0000 | | 0.9836 | *** | 0.0331 | | 0.0162 | 0.8323 | 1.5738 |
| | (0.0003) | | (0.0720) | | (0.0819) | | (0.0795) | | |
| 2003/2Q | −0.0001 | | 0.9067 | *** | 0.1553 | | −0.0882 | 0.7790 | 2.4092 |
| | (0.0004) | | (0.0866) | | (0.1071) | | (0.0800) | | |
| 2003/3Q | 0.0005 | | 0.9231 | *** | 0.0655 | | 0.0614 | 0.8956 | 1.8405 |
| | (0.0003) | | (0.0636) | | (0.0575) | | (0.0565) | | |
| 2003/4Q | 0.0001 | | 1.0700 | *** | 0.0189 | | −0.0755 | 0.9248 | 1.8161 |
| | (0.0003) | | (0.0527) | | (0.0498) | | (0.0601) | | |

All are calculated by author.

1) Daily Foreign exchange data are from Datastream.

2) Estimated coefficients (standard errors) are calculated by OLS of Frankel and Wei Model.

3) ***. ** and * indicate that the estimated coefficients are statistically significant at the 1%, 5% and 10% levels, respectively.

4) If the sign of estimated coefficient is minus and statistically significant, we remove such explanatory variable from OLS model and re-estimated the coefficients. We denote (-) in the column of removed explanatory variable.

Table 1.5 Taiwan dollar

| Period | Constant | | US dollar | | Japanese yen | | Euro | | Adj.R squared | D.W. Stat. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1999/1Q | 0.0004 | | 0.9502 | *** | 0.0281 | | −0.0057 | | 0.8105 | 2.1649 |
| | (0.0004) | | (0.0783) | | (0.0411) | | (0.0796) | | | |
| 1999/2Q | −0.0004 | *** | 0.9735 | *** | 0.0604 | *** | −0.0297 | | 0.9623 | 1.6396 |
| | (0.0001) | | (0.0304) | | (0.0201) | | (0.0320) | | | |
| 1999/3Q | −0.0002 | | 0.9986 | *** | 0.0053 | | −0.0429 | | 0.9722 | 2.5148 |
| | (0.0001) | | (0.0259) | | (0.0173) | | (0.0285) | | | |
| 1999/4Q | −0.0002 | ** | 0.9949 | *** | −0.0054 | | 0.0229 | | 0.9824 | 1.7527 |
| | (0.0001) | | (0.0221) | | (0.0149) | | (0.0291) | | | |
| 2000/1Q | −0.0005 | | 0.9966 | *** | −0.0859 | | − | | 0.7583 | 2.4559 |
| | (0.0004) | | (0.0917) | | (0.0594) | | − | | | |
| 2000/2Q | 0.0002 | | 0.9828 | *** | −0.0232 | | 0.1383 | *** | 0.9617 | 1.9075 |
| | (0.0002) | | (0.0335) | | (0.0229) | | (0.0297) | | | |
| 2000/3Q | 0.0002 | | 1.0070 | *** | −0.0261 | | 0.0322 | | 0.9750 | 2.3179 |
| | (0.0001) | | (0.0389) | | (0.0295) | | (0.0301) | | | |
| 2000/4Q | 0.0009 | ** | 0.9811 | *** | −0.0465 | | 0.0324 | | 0.7882 | 1.3720 |
| | (0.0004) | | (0.0980) | | (0.0974) | | (0.0610) | | | |
| 2001/1Q | −0.0003 | | 0.8774 | *** | 0.0661 | * | 0.0749 | ** | 0.9239 | 2.0242 |
| | (0.0003) | | (0.0528) | | (0.0379) | | (0.0367) | | | |
| 2001/2Q | 0.0007 | * | 1.0009 | *** | −0.0235 | | 0.0478 | | 0.7898 | 2.2852 |
| | (0.0004) | | (0.0902) | | (0.0651) | | (0.0800) | | | |
| 2001/3Q | 0.0000 | | 1.0613 | *** | −0.0198 | | −0.0167 | | 0.9562 | 1.6401 |
| | (0.0002) | | (0.0378) | | (0.0372) | | (0.0374) | | | |
| 2001/4Q | 0.0001 | | 0.9067 | *** | 0.0760 | ** | 0.0158 | | 0.9582 | 1.4915 |
| | (0.0001) | | (0.0346) | | (0.0376) | | (0.0344) | | | |
| 2002/1Q | 0.0000 | | 0.9593 | *** | 0.0813 | *** | −0.0250 | | 0.9612 | 2.6529 |
| | (0.0001) | | (0.0293) | | (0.0192) | | (0.0346) | | | |
| 2002/2Q | −0.0004 | | 0.8170 | *** | 0.0981 | ** | 0.0412 | | 0.8896 | 2.2585 |
| | (0.0003) | | (0.0515) | | (0.0483) | | (0.0544) | | | |
| 2002/3Q | 0.0007 | ** | 0.7621 | *** | 0.0560 | | 0.0332 | | 0.8516 | 1.7835 |
| | (0.0003) | | (0.0499) | | (0.0671) | | (0.0602) | | | |
| 2002/4Q | −0.0001 | | 0.9243 | *** | 0.1308 | *** | −0.0777 | | 0.8674 | 2.2007 |
| | (0.0002) | | (0.0588) | | (0.0468) | | (0.0678) | | | |
| 2003/1Q | 0.0000 | | 0.9306 | *** | 0.0483 | | −0.0740 | | 0.9302 | 2.1876 |
| | (0.0002) | | (0.0410) | | (0.0467) | | (0.0454) | | | |
| 2003/2Q | −0.0001 | | 0.9751 | *** | 0.0216 | | − | | 0.9751 | 2.2623 |
| | (0.0001) | | (0.0244) | | (0.0326) | | − | | | |
| 2003/3Q | −0.0002 | | 0.8605 | *** | 0.1273 | *** | −0.0092 | | 0.9509 | 2.4978 |
| | (0.0002) | | (0.0411) | | (0.0372) | | (0.0366) | | | |
| 2003/4Q | 0.0001 | | 0.9418 | *** | 0.0489 | | 0.0000 | | 0.9509 | 2.2416 |
| | (0.0002) | | (0.0376) | | (0.0356) | | (0.0000) | | | |

All are calculated by author.

1) Daily Foreign exchange data are from Datastream.

2) Estimated coefficients (standard errors) are calculated by OLS of Frankel and Wei Model.

3) ***. ** and * indicate that the estimated coefficients are statistically significant at the 1%, 5% and 10% levels, respectively.

4) If the sign of estimated coefficient is minus and statistically significant, we remove such explanatory variable from OLS model and re-estimated the coefficients. We denote (-) in the column of removed explanatory variable.

Table 1.6 Indonesia rupiah

| Period | Constant | US dollar | | Japanese yen | | Euro | Adj.R squared | D.W. Stat. |
|---|---|---|---|---|---|---|---|---|
| 1999/1Q | 0.0016 | 1.0177 | ** | 0.6519 | *** | – | 0.2929 | 2.0214 |
| | (0.0022) | (0.3857) | | (0.2340) | | – | | |
| 1999/2Q | −0.0034 | 1.3769 | *** | −0.1431 | | −0.2181 | 0.1012 | 1.6279 |
| | (0.0020) | (0.4696) | | (0.3105) | | (0.4937) | | |
| 1999/3Q | 0.0040 | 0.7231 | *** | 0.6578 | ** | −0.7813 | 0.1213 | 1.6018 |
| | (0.0026) | (0.4777) | | (0.3195) | | (0.5263) | | |
| 1999/4Q | −0.0029 | 0.2601 | *** | 0.2614 | | 0.4603 | 0.0117 | 1.0930 |
| | (0.0020) | (0.4613) | | (0.3098) | | (0.6069) | | |
| 2000/1Q | 0.0013 | 1.1640 | *** | 0.0663 | | −0.1721 | 0.4423 | 2.1837 |
| | (0.0012) | (0.2405) | | (0.1545) | | (0.2536) | | |
| 2000/2Q | 0.0020 | 1.0805 | *** | 0.0476 | | 0.3574 | 0.3692 | 2.0100 |
| | (0.0013) | (0.2619) | | (0.1795) | | (0.2326) | | |
| 2000/3Q | 0.0003 | 1.4564 | *** | −0.0587 | | 0.4136 | 0.3878 | 1.9748 |
| | (0.0016) | (0.4500) | | (0.3410) | | (0.3483) | | |
| 2000/4Q | 0.0009 | 0.7333 | *** | 0.4731 | * | −0.1539 | 0.4191 | 2.2033 |
| | (0.0011) | (0.2531) | | (0.2514) | | (0.1575) | | |
| 2001/1Q | 0.0014 | 1.2016 | *** | −0.0436 | | −0.0162 | 0.4332 | 1.9332 |
| | (0.0012) | (0.2447) | | (0.1755) | | (0.1700) | | |
| 2001/2Q | 0.0019 | 1.1367 | *** | 0.5538 | ** | 0.1319 | 0.4262 | 1.7277 |
| | (0.0016) | (0.3545) | | (0.2561) | | (0.3145) | | |
| 2001/3Q | −0.0030 | 1.6856 | *** | −0.5588 | | −0.0896 | 0.2354 | 1.3447 |
| | (0.0023) | (0.3972) | | (0.3909) | | (0.3928) | | |
| 2001/4Q | 0.0004 | 0.7524 | *** | 0.4935 | | 0.0691 | 0.2713 | 1.5074 |
| | (0.0014) | (0.3404) | | (0.3706) | | (0.3383) | | |
| 2002/1Q | −0.0009 | 0.8402 | *** | 0.0527 | | 0.0695 | 0.4147 | 1.6764 |
| | (0.0006) | (0.1479) | | (0.0972) | | (0.1748) | | |
| 2002/2Q | −0.0020 | 1.1043 | *** | −0.0786 | | −0.2800 | 0.2915 | 1.7977 |
| | (0.0011) | (0.2330) | | (0.2184) | | (0.2458) | | |
| 2002/3Q | 0.0005 | 0.6038 | *** | 0.0745 | | 0.1536 | 0.3231 | 2.2001 |
| | (0.0009) | (0.1448) | | (0.1949) | | (0.1747) | | |
| 2002/4Q | −0.0002 | 1.0894 | *** | 0.0719 | | 0.1609 | 0.5021 | 2.1424 |
| | (0.0007) | (0.1827) | | (0.1455) | | (0.2107) | | |
| 2003/1Q | −0.0001 | 0.8844 | *** | 0.0255 | | −0.0793 | 0.7519 | 1.8424 |
| | (0.0004) | (0.0802) | | (0.0913) | | (0.0886) | | |
| 2003/2Q | −0.0014 | 0.9500 | *** | 0.1529 | | −0.1848 | 0.6369 | 2.0450 |
| | (0.0006) | (0.1245) | | (0.1540) | | (0.1150) | | |
| 2003/3Q | 0.0004 | 0.9650 | *** | 0.1205 | | −0.0761 | 0.6217 | 2.1506 |
| | (0.0007) | (0.1517) | | (0.1372) | | (0.1349) | | |
| 2003/4Q | 0.0001 | 0.9863 | *** | −0.0215 | | −0.0725 | 0.8417 | 2.1133 |
| | (0.0003) | (0.0716) | | (0.0677) | | (0.0816) | | |

All are calculated by author.

1) Daily Foreign exchange data are from Datastream.

2) Estimated coefficients (standard errors) are calculated by OLS of Frankel and Wei Model.

3) ***. ** and * indicate that the estimated coefficients are statistically significant at the 1%, 5% and 10% levels, respectively.

4) If the sign of estimated coefficient is minus and statistically significant, we remove such explanatory variable from OLS model and re-estimated the coefficients. We denote (–) in the column of removed explanatory variable.

Table 1.7 Malaysian ringgit

| Period | Constant | US dollar | | Japanese yen | | Euro | | Adj.R squared | D.W. Stat. |
|---|---|---|---|---|---|---|---|---|---|
| 1999/1Q | 0.0000 | 1.0308 | *** | 0.0020 | | -0.0008 | | 0.9908 | 2.8159 |
| | (0.0001) | (0.0167) | | (0.0088) | | (0.0170) | | | |
| 1999/2Q | 0.0000 | 0.9998 | *** | 0.0023 | | - | | 0.9997 | 3.1119 |
| | (0.0000) | (0.0027) | | (0.0018) | | - | | | |
| 1999/3Q | 0.0000 | 0.9982 | *** | -0.0004 | | -0.0008 | | 0.9999 | 2.8856 |
| | (0.0000) | (0.0014) | | (0.0009) | | (0.0015) | | | |
| 1999/4Q | 0.0000 | 0.9997 | *** | -0.0003 | | 0.0025 | *** | 1.0000 | 3.1139 |
| | (0.0000) | (0.0006) | | (0.0004) | | (0.0008) | | | |
| 2000/1Q | 0.0000 | 1.0001 | *** | -0.0001 | | -0.0005 | | 1.0000 | 2.9452 |
| | (0.0000) | (0.0005) | | (0.0003) | | (0.0005) | | | |
| 2000/2Q | 0.0000 | 0.9999 | *** | 0.0001 | | 0.0001 | | 1.0000 | 2.9970 |
| | (0.0000) | (0.0004) | | (0.0003) | | (0.0004) | | | |
| 2000/3Q | 0.0000 | 1.0000 | *** | 0.0000 | * | 0.0000 | * | 1.0000 | 2.8199 |
| | (0.0000) | (0.0000) | | (0.0000) | | (0.0000) | | | |
| 2000/4Q | 0.0000 | 0.9998 | *** | 0.0012 | | -0.0007 | | 1.0000 | 2.6372 |
| | (0.0000) | (0.0014) | | (0.0014) | | (0.0009) | | | |
| 2001/1Q | 0.0000 | 1.0029 | *** | -0.0010 | | 0.0007 | | 0.9997 | 2.6010 |
| | (0.0000) | (0.0035) | | (0.0025) | | (0.0024) | | | |
| 2001/2Q | 0.0000 | 1.0046 | *** | -0.0049 | | -0.0022 | | 0.9995 | 2.9467 |
| | (0.0000) | (0.0041) | | (0.0030) | | (0.0037) | | | |
| 2001/3Q | 0.0000 | 0.9950 | *** | 0.0045 | | -0.0045 | | 0.9996 | 2.4019 |
| | (0.0000) | (0.0032) | | (0.0031) | | (0.0032) | | | |
| 2001/4Q | 0.0000 | 0.9994 | *** | 0.0015 | | 0.0064 | | 0.9997 | 2.3733 |
| | (0.0000) | (0.0044) | | (0.0048) | | (0.0044) | | | |
| 2002/1Q | 0.0000 | 1.0109 | *** | -0.0027 | | -0.0034 | | 0.9984 | 3.0736 |
| | (0.0000) | (0.0058) | | (0.0038) | | (0.0069) | | | |
| 2002/2Q | 0.0000 | 1.0019 | *** | -0.0033 | | -0.0003 | | 0.9993 | 3.0994 |
| | (0.0000) | (0.0045) | | (0.0042) | | (0.0048) | | | |
| 2002/3Q | 0.0000 | 0.9997 | *** | -0.0028 | | 0.0036 | | 0.9994 | 2.9721 |
| | (0.0000) | (0.0038) | | (0.0051) | | (0.0045) | | | |
| 2002/4Q | 0.0000 | 0.9900 | *** | 0.0031 | | 0.0128 | * | 0.9987 | 2.8002 |
| | (0.0000) | (0.0057) | | (0.0045) | | (0.0066) | | | |
| 2003/1Q | 0.0000 | 0.9987 | *** | 0.0002 | | 0.0001 | | 0.9990 | 2.9652 |
| | (0.0000) | (0.0051) | | (0.0058) | | (0.0057) | | | |
| 2003/2Q | 0.0000 | 1.0107 | *** | -0.0037 | | -0.0020 | | 0.9982 | 3.0175 |
| | (0.0000) | (0.0074) | | (0.0091) | | (0.0068) | | | |
| 2003/3Q | 0.0000 | 0.9833 | *** | 0.0010 | | 0.0093 | | 0.9960 | 2.8637 |
| | (0.0001) | (0.0118) | | (0.0107) | | (0.0105) | | | |
| 2003/4Q | 0.0000 | 1.0037 | *** | 0.0036 | | 0.0045 | | 0.9963 | 2.9324 |
| | (0.0001) | (0.0108) | | (0.0102) | | (0.0123) | | | |

All are calculated by author.

1) Daily Foreign exchange data are from Datastream.

2) Estimated coefficients (standard errors) are calculated by OLS of Frankel and Wei Model.

3) ***. ** and * indicate that the estimated coefficients are statistically significant at the 1%, 5% and 10% levels, respectively.

4) If the sign of estimated coefficient is minus and statistically significant, we remove such explanatory variable from OLS model and re-estimated the coefficients. We denote (-) in the column of removed explanatory variable.

Table 1.8 HongKong dollar

| Period | Constant | | US dollar | | Japanese yen | | Euro | Adj.R squared | D.W. Stat. |
|---|---|---|---|---|---|---|---|---|---|
| 1999/1Q | 0.0000 | | 0.9967 | *** | -0.0004 | | -0.0005 | 0.9999 | 2.2385 |
| | (0.0000) | | (0.0020) | | (0.0010) | | (0.0020) | | |
| 1999/2Q | 0.0000 | | 0.9988 | *** | 0.0013 | | -0.0011 | 0.9997 | 2.4947 |
| | (0.0000) | | (0.0027) | | (0.0018) | | (0.0029) | | |
| 1999/3Q | 0.0000 | *** | 1.0009 | *** | 0.0026 | *** | - | 0.9999 | 1.6833 |
| | (0.0000) | | (0.0012) | | (0.0008) | | - | | |
| 1999/4Q | 0.0000 | | 0.9976 | *** | 0.0010 | | -0.0063 | 0.9994 | 2.0306 |
| | (0.0000) | | (0.0041) | | (0.0028) | | (0.0054) | | |
| 2000/1Q | 0.0000 | *** | 1.0011 | *** | 0.0008 | | -0.0023 | 0.9999 | 1.6000 |
| | (0.0000) | | (0.0018) | | (0.0011) | | (0.0019) | | |
| 2000/2Q | 0.0000 | ** | 1.0007 | *** | -0.0002 | | -0.0002 | 0.9999 | 1.6476 |
| | (0.0000) | | (0.0016) | | (0.0011) | | (0.0014) | | |
| 2000/3Q | 0.0000 | | 1.0012 | *** | -0.0011 | | -0.0017 | 0.9999 | 2.1900 |
| | (0.0000) | | (0.0023) | | (0.0018) | | (0.0018) | | |
| 2000/4Q | 0.0000 | | 1.0006 | *** | -0.0016 | | 0.0017 | 0.9997 | 1.9315 |
| | (0.0000) | | (0.0034) | | (0.0033) | | (0.0021) | | |
| 2001/1Q | 0.0000 | | 0.9996 | *** | 0.0000 | | 0.0010 | 1.0000 | 2.2175 |
| | (0.0000) | | (0.0009) | | (0.0006) | | (0.0006) | | |
| 2001/2Q | 0.0000 | | 0.9997 | *** | -0.0001 | | 0.0006 | 1.0000 | 2.4750 |
| | (0.0000) | | (0.0011) | | (0.0008) | | (0.0010) | | |
| 2001/3Q | 0.0000 | | 1.0004 | *** | -0.0003 | | -0.0003 | 1.0000 | 2.3293 |
| | (0.0000) | | (0.0007) | | (0.0007) | | (0.0007) | | |
| 2001/4Q | 0.0000 | | 1.0020 | *** | -0.0007 | | -0.0014 | 1.0000 | 2.0106 |
| | (0.0000) | | (0.0016) | | (0.0018) | | (0.0016) | | |
| 2002/1Q | 0.0000 | | 0.9996 | *** | 0.0000 | | 0.0006 | 1.0000 | 2.1110 |
| | (0.0000) | | (0.0009) | | (0.0006) | | (0.0010) | | |
| 2002/2Q | 0.0000 | | 0.9999 | *** | -0.0003 | | -0.0004 | 1.0000 | 2.2688 |
| | (0.0000) | | (0.0005) | | (0.0005) | | (0.0005) | | |
| 2002/3Q | 0.0000 | | 0.9998 | *** | -0.0001 | | 0.0004 | 1.0000 | 2.6204 |
| | (0.0000) | | (0.0003) | | (0.0004) | | (0.0004) | | |
| 2002/4Q | 0.0000 | | 1.0005 | *** | 0.0000 | | -0.0010 | 1.0000 | 1.9872 |
| | (0.0000) | | (0.0010) | | (0.0008) | | (0.0011) | | |
| 2003/1Q | 0.0000 | | 0.9995 | *** | 0.0001 | | -0.0005 | 1.0000 | 1.8940 |
| | (0.0000) | | (0.0006) | | (0.0006) | | (0.0006) | | |
| 2003/2Q | 0.0000 | | 0.9998 | *** | 0.0003 | | -0.0008 | 1.0000 | 2.5703 |
| | (0.0000) | | (0.0007) | | (0.0009) | | (0.0007) | | |
| 2003/3Q | -0.0001 | | 0.9770 | *** | 0.0201 | | -0.0240 | 0.9831 | 2.3948 |
| | (0.0001) | | (0.0244) | | (0.0220) | | (0.0217) | | |
| 2003/4Q | 0.0001 | | 0.9618 | *** | 0.0495 | *** | - | 0.0007 | 0.0000 |
| | (0.0001) | | (0.0180) | | (0.0171) | | - | | |

All are calculated by author.

1) Daily Foreign exchange data are from Datastream.

2) Estimated coefficients (standard errors) are calculated by OLS of Frankel and Wei Model.

3) ***. ** and * indicate that the estimated coefficients are statistically significant at the 1%, 5% and 10% levels, respectively.

4) If the sign of estimated coefficient is minus and statistically significant, we remove such explanatory variable from OLS model and re-estimated the coefficients. We denote (-) in the column of removed explanatory variable.

Table 1.9 Chinese yuan

| Period | Constant | US dollar | | Japanese yen | Euro | | Adj.R squared | D.W. Stat. |
|---|---|---|---|---|---|---|---|---|
| 1999/1Q | 0.0000 | 1.0000 | *** | -0.0004 | -0.0001 | | 1.0000 | 1.9610 |
| | (0.0000) | (0.0008) | | (0.0004) | (0.0008) | | | |
| 1999/2Q | 0.0000 | 0.9997 | *** | -0.0005 | 0.0002 | | 0.9999 | 2.0059 |
| | (0.0000) | (0.0012) | | (0.0008) | (0.0013) | | | |
| 1999/3Q | 0.0000 | 1.0006 | *** | 0.0004 | -0.0001 | | 1.0000 | 2.4993 |
| | (0.0000) | (0.0006) | | (0.0004) | (0.0006) | | | |
| 1999/4Q | 0.0000 | 0.9996 | *** | 0.0005 | -0.0004 | | 1.0000 | 2.3815 |
| | (0.0000) | (0.0007) | | (0.0005) | (0.0009) | | | |
| 2000/1Q | 0.0000 | 1.0010 | *** | -0.0003 | 0.0001 | | 1.0000 | 1.7643 |
| | (0.0000) | (0.0010) | | (0.0007) | (0.0011) | | | |
| 2000/2Q | 0.0000 | 0.9997 | *** | 0.0001 | 0.0002 | | 1.0000 | 2.0342 |
| | (0.0000) | (0.0009) | | (0.0006) | (0.0008) | | | |
| 2000/3Q | 0.0000 | 0.9993 | *** | 0.0012 | -0.0008 | | 1.0000 | 2.1426 |
| | (0.0000) | (0.0018) | | (0.0013) | (0.0014) | | | |
| 2000/4Q | 0.0000 | 0.9981 | *** | 0.0009 | -0.0009 | | 0.9999 | 2.3170 |
| | (0.0000) | (0.0014) | | (0.0014) | (0.0009) | | | |
| 2001/1Q | 0.0000 | 1.0017 | *** | -0.0006 | -0.0021 | | 0.9999 | 2.0471 |
| | (0.0000) | (0.0015) | | (0.0011) | (0.0010) | | | |
| 2001/2Q | 0.0000 | 0.9986 | *** | 0.0007 | 0.0018 | | 0.9999 | 2.5625 |
| | (0.0000) | (0.0014) | | (0.0010) | (0.0012) | | | |
| 2001/3Q | 0.0000 | 1.0002 | *** | 0.0001 | -0.0006 | | 1.0000 | 2.5145 |
| | (0.0000) | (0.0005) | | (0.0005) | (0.0005) | | | |
| 2001/4Q | 0.0000 | 0.9999 | *** | 0.0001 | 0.0001 | | 1.0000 | 1.6921 |
| | (0.0000) | (0.0005) | | (0.0006) | (0.0005) | | | |
| 2002/1Q | 0.0000 | 1.0018 | *** | - | 0.0000 | | 1.0000 | 2.2453 |
| | (0.0000) | (0.0005) | | - | (0.0006) | | | |
| 2002/2Q | 0.0000 | 0.9997 | *** | 0.0000 | 0.0001 | | 1.0000 | 2.1068 |
| | (0.0000) | (0.0005) | | (0.0004) | (0.0005) | | | |
| 2002/3Q | 0.0000 | 1.0003 | *** | 0.0000 | -0.0005 | | 1.0000 | 2.4026 |
| | (0.0000) | (0.0003) | | (0.0004) | (0.0003) | | | |
| 2002/4Q | 0.0000 | 1.0006 | *** | -0.0002 | -0.0012 | | 1.0000 | 2.3521 |
| | (0.0000) | (0.0007) | | (0.0005) | (0.0008) | | | |
| 2003/1Q | 0.0000 | 0.9994 | *** | 0.0001 | 0.0012 | * | 1.0000 | 2.3872 |
| | (0.0000) | (0.0006) | | (0.0006) | (0.0006) | | | |
| 2003/2Q | 0.0000 | 1.0003 | *** | 0.0005 | -0.0002 | | 1.0000 | 2.4281 |
| | (0.0000) | (0.0004) | | (0.0006) | (0.0004) | | | |
| 2003/3Q | 0.0000 | 0.9999 | *** | 0.0007 | 0.0005 | | 1.0000 | 2.3274 |
| | (0.0000) | (0.0005) | | (0.0004) | (0.0004) | | | |
| 2003/4Q | 0.0000 | 1.0002 | *** | -0.0004 | 0.0002 | | 1.0000 | 2.1271 |
| | (0.0000) | (0.0004) | | (0.0003) | (0.0004) | | | |

All are calculated by author.

1) Daily Foreign exchange data are from Datastream.

2) Estimated coefficients (standard errors) are calculated by OLS of Frankel and Wei Model.

3) ***. ** and * indicate that the estimated coefficients are statistically significant at the 1%, 5% and 10% levels, respectively.

4) If the sign of estimated coefficient is minus and statistically significant, we remove such explanatory variable from OLS model and re-estimated the coefficients. We denote (-) in the column of removed explanatory variable.

Figure 1.1 Movements in coefficient on the US dollar for Thai baht

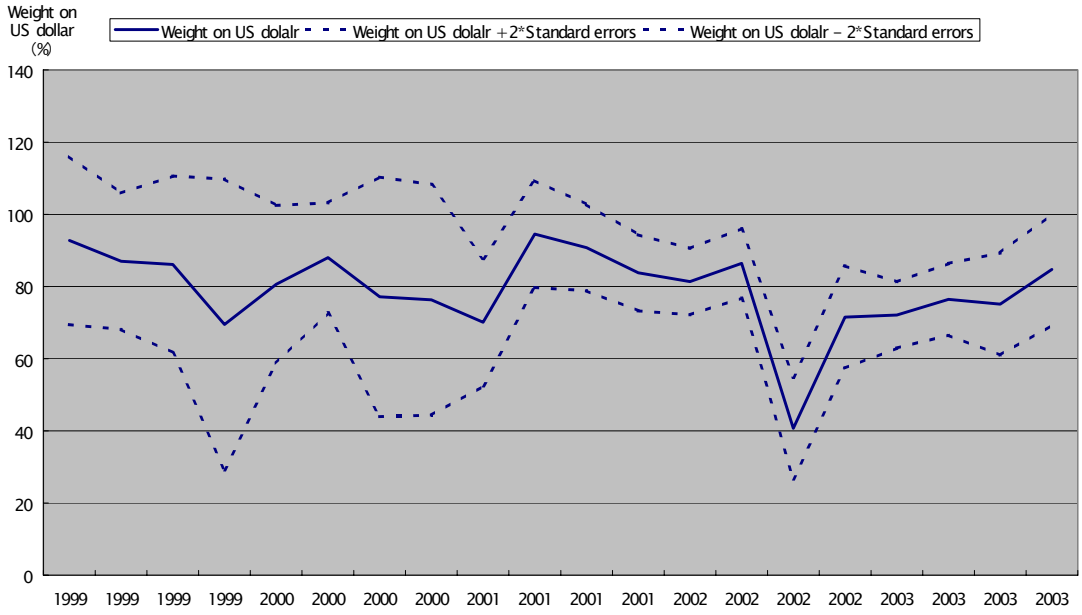



Figure 1.2 Movements in coefficient on the US dollar for the Singapore dollar

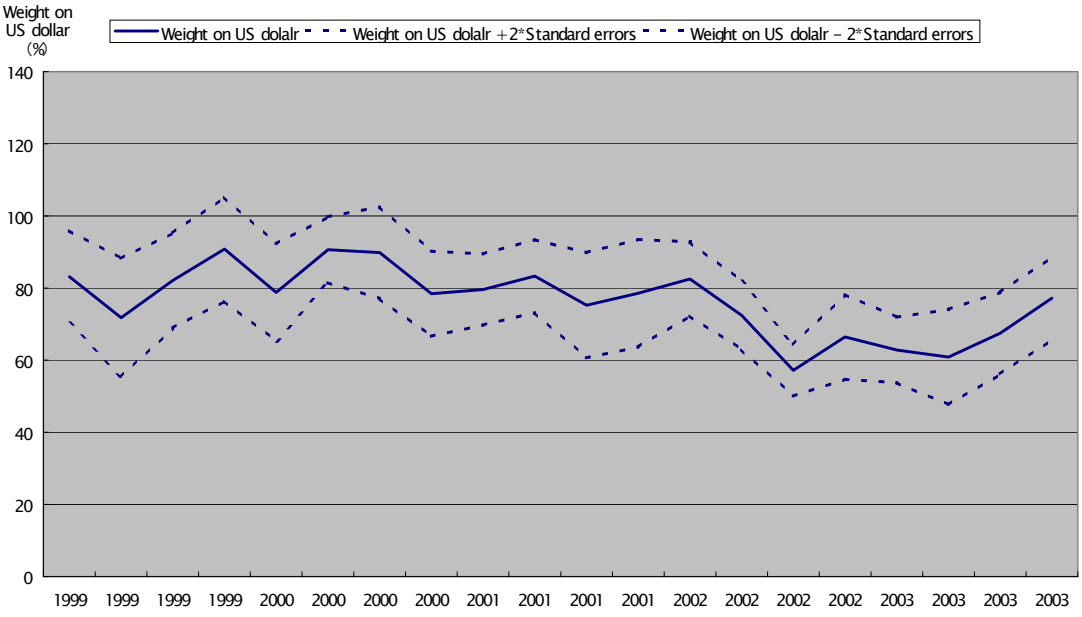


Figure 1.3 Movements in coefficient on US dollar for the Korean won

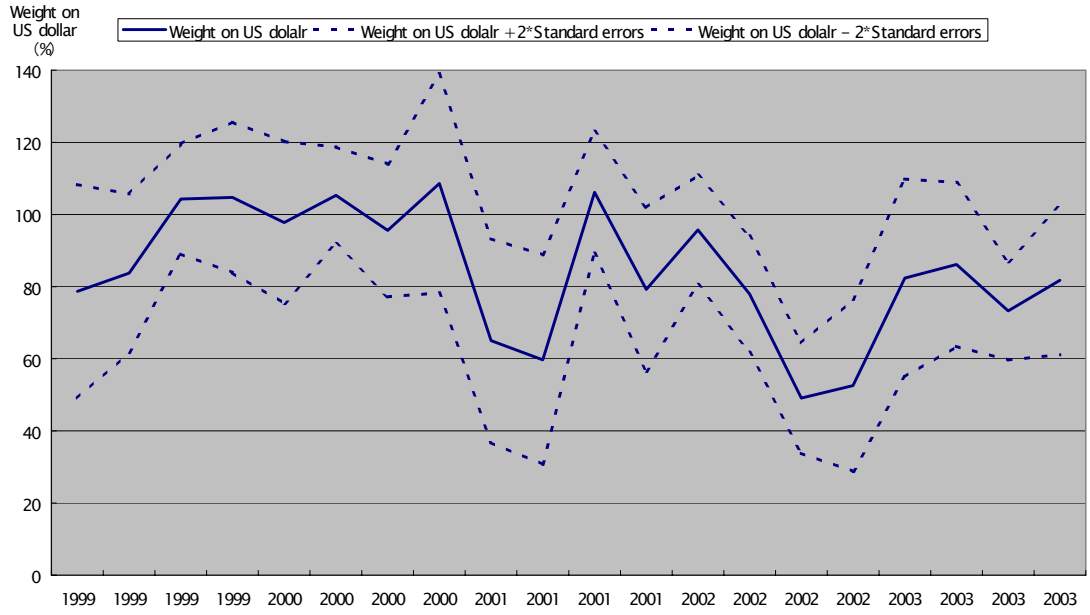



Figure 1.4 Movements in coefficient on the US dollar for the Philippine peso

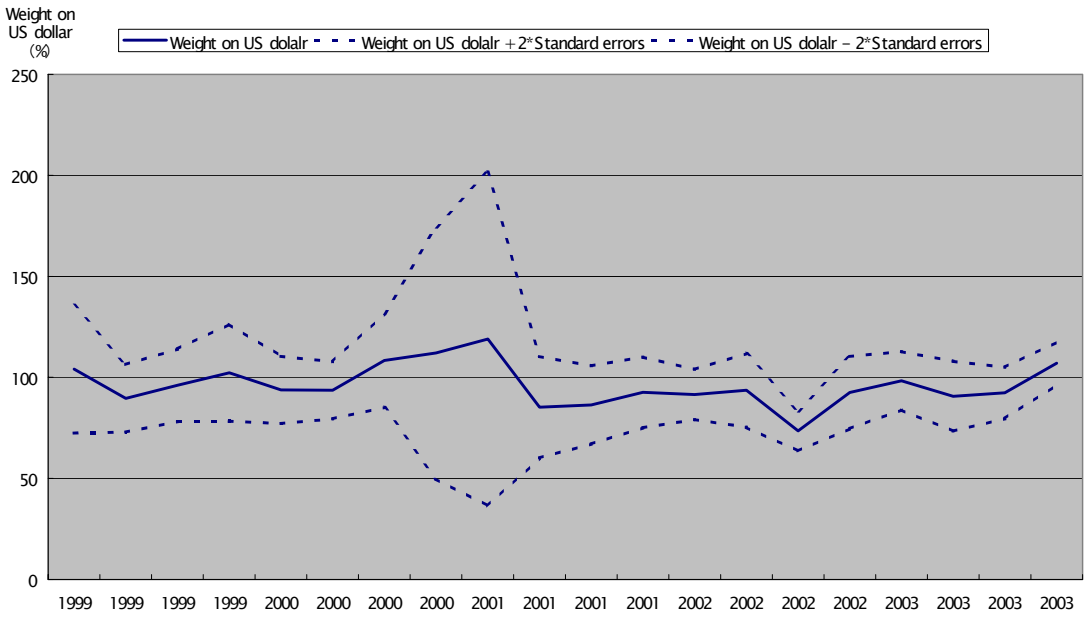


Figure 1.5 Movements in coefficient on US dollar for the Taiwan dollar

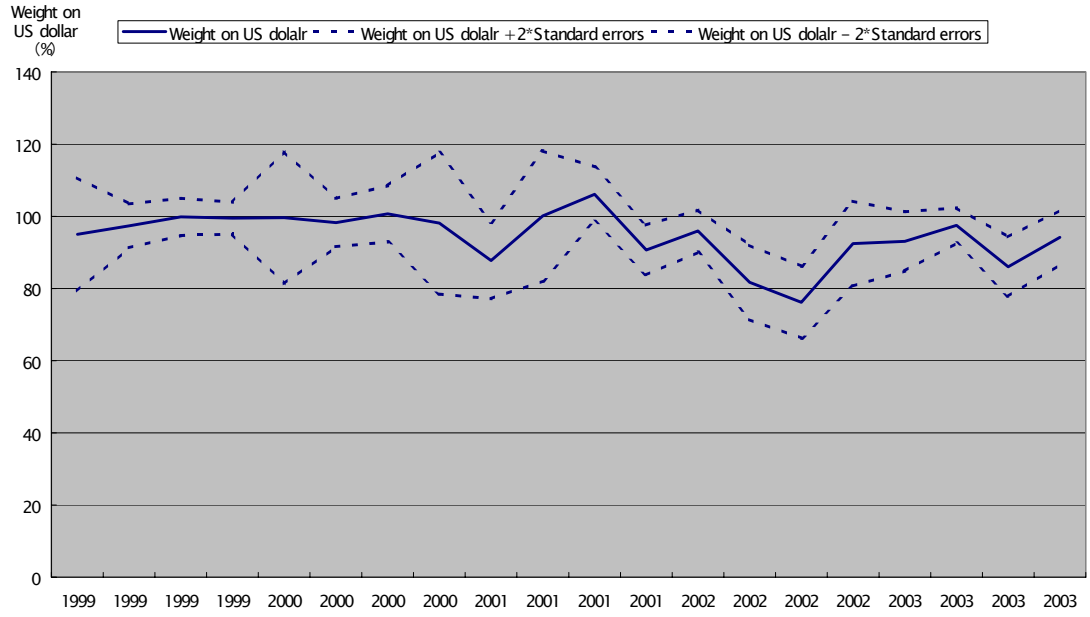



Figure 1.6 Movements in coefficient on the US dollar for the Indonesia rupiah

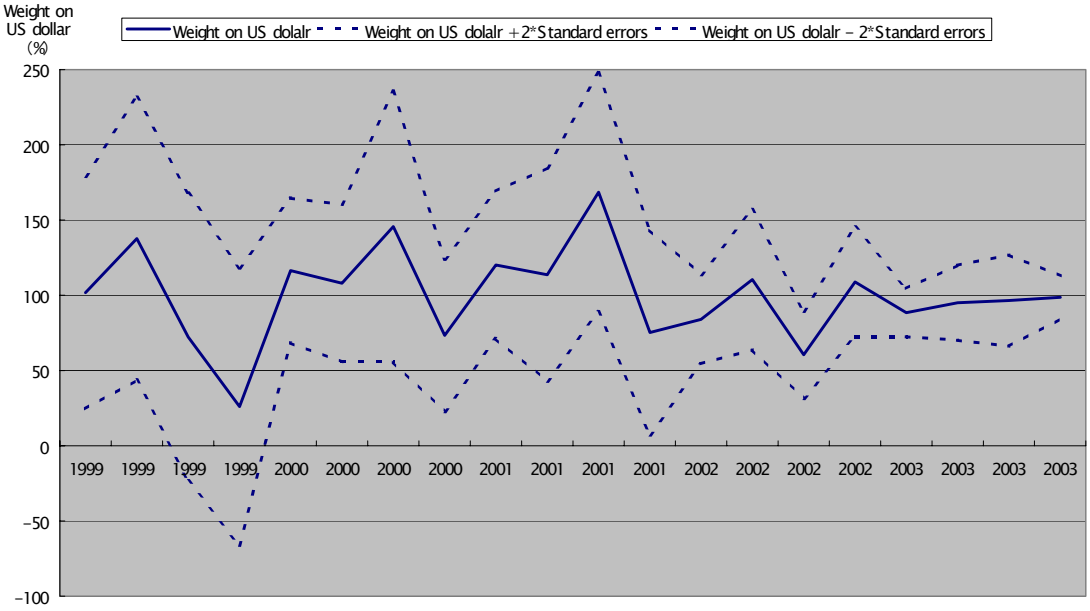


Figure 1.7 Movements in coefficient on the US dollar for the Malaysian ringgit

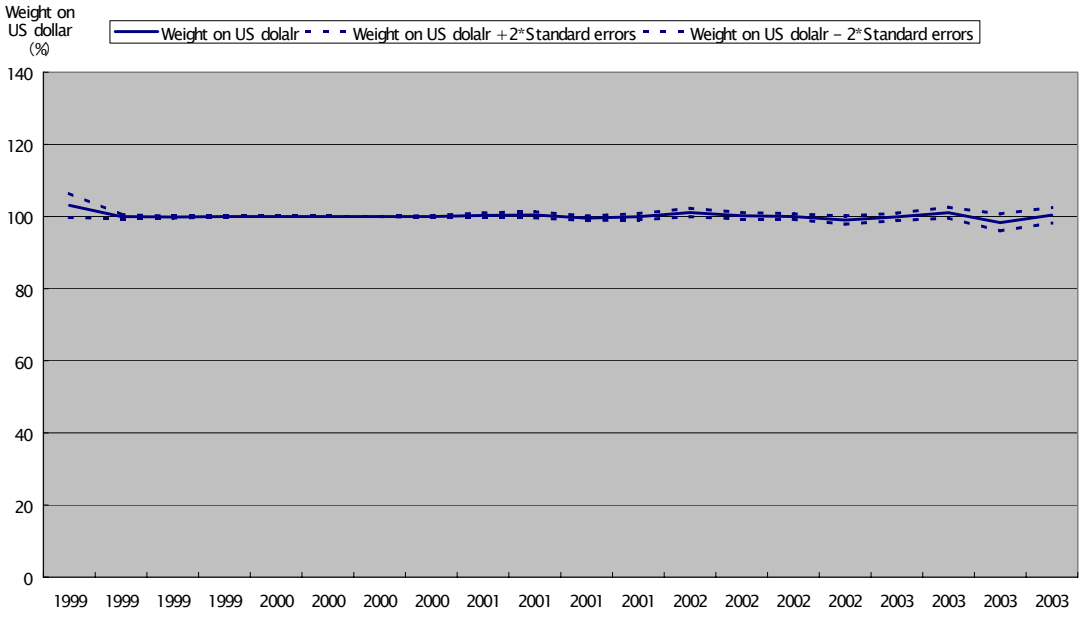



Figure 1.8 Movements in coefficient on the US dollar for the Hong Kong dolalr

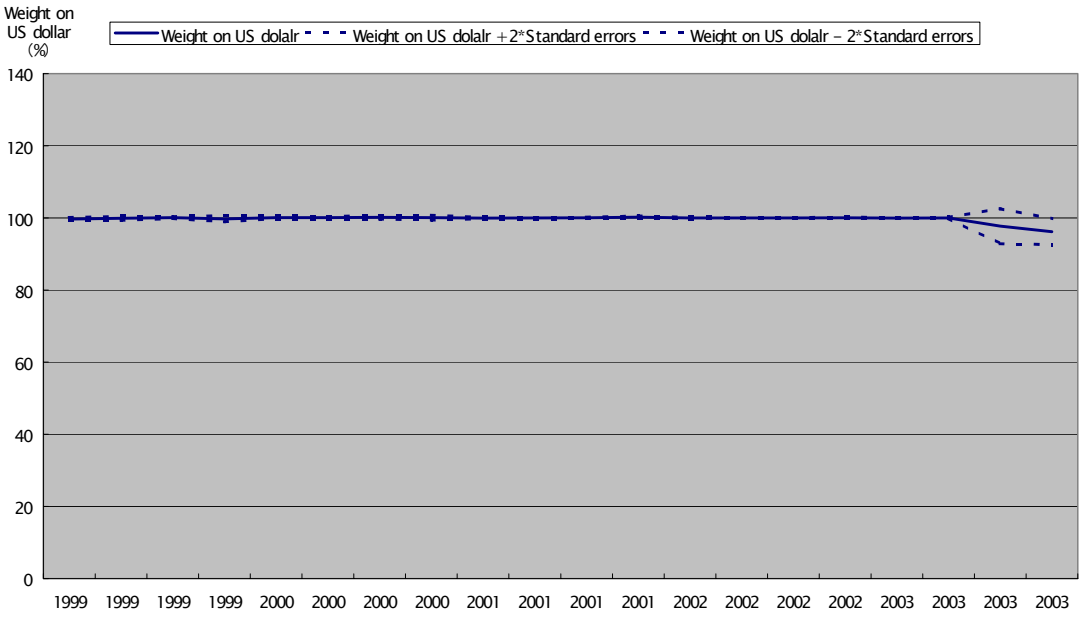


Figure 1.9 Movements in coefficient on the US dollar for the Chinese Yuan

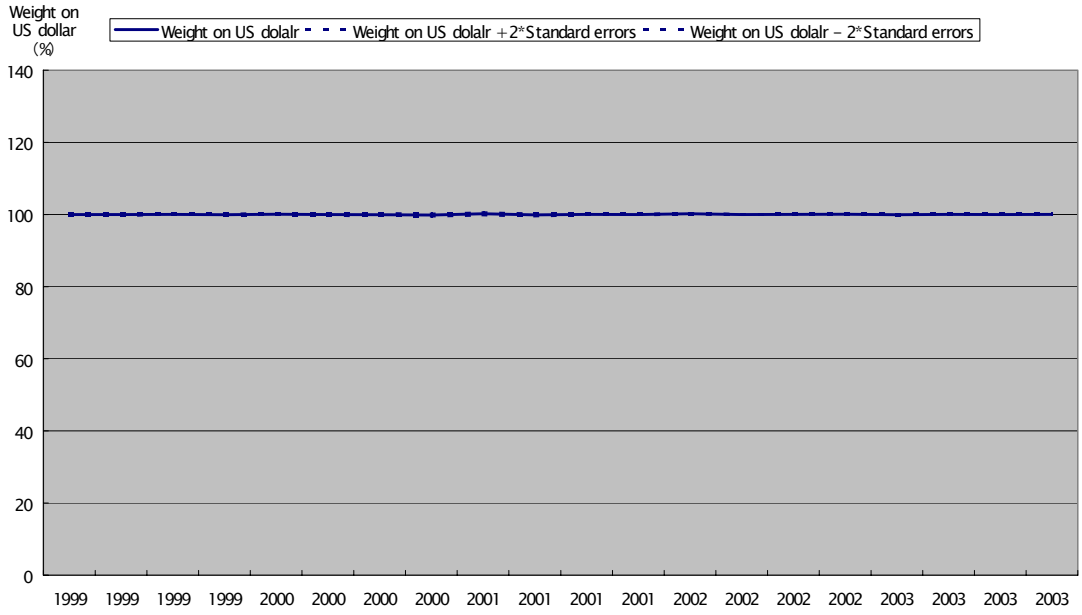
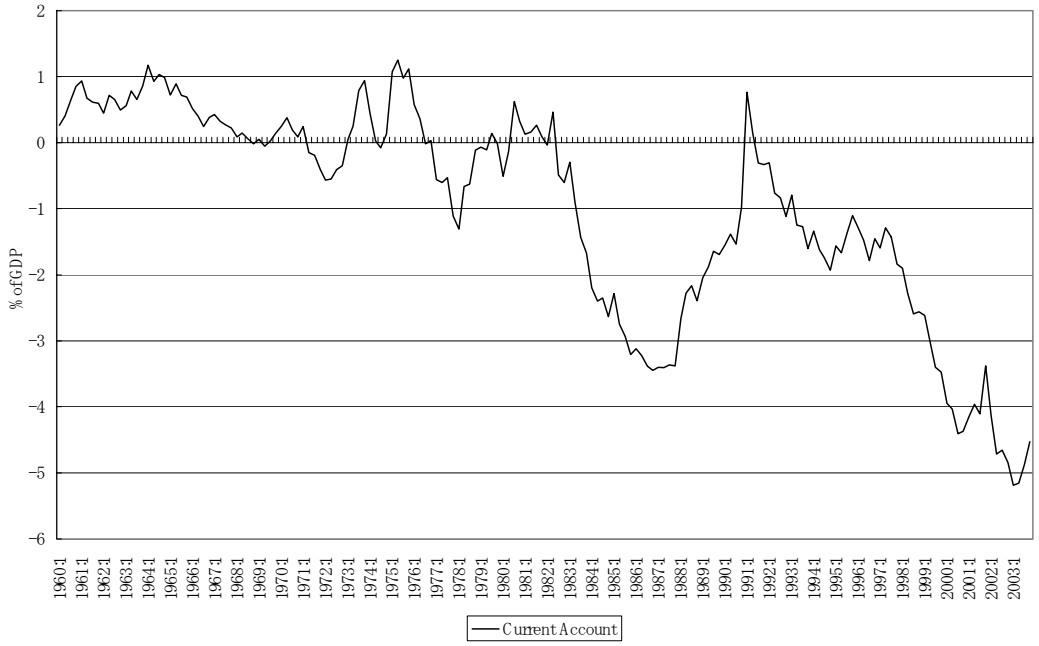



**Figure 2: Current Account**



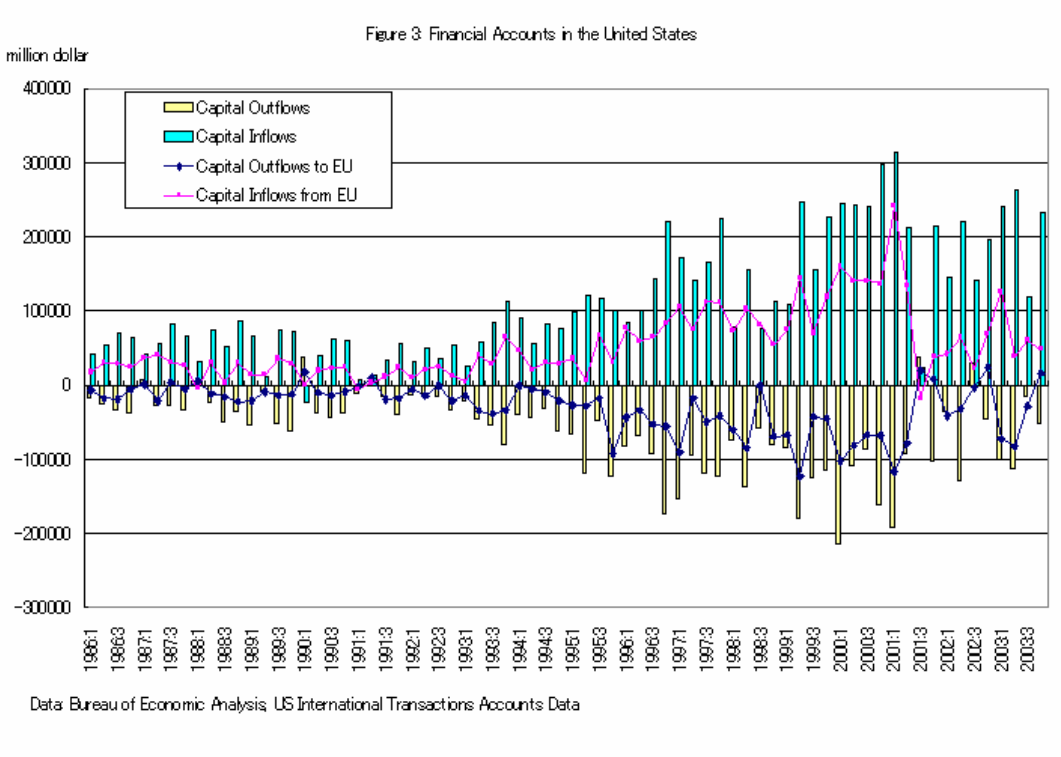
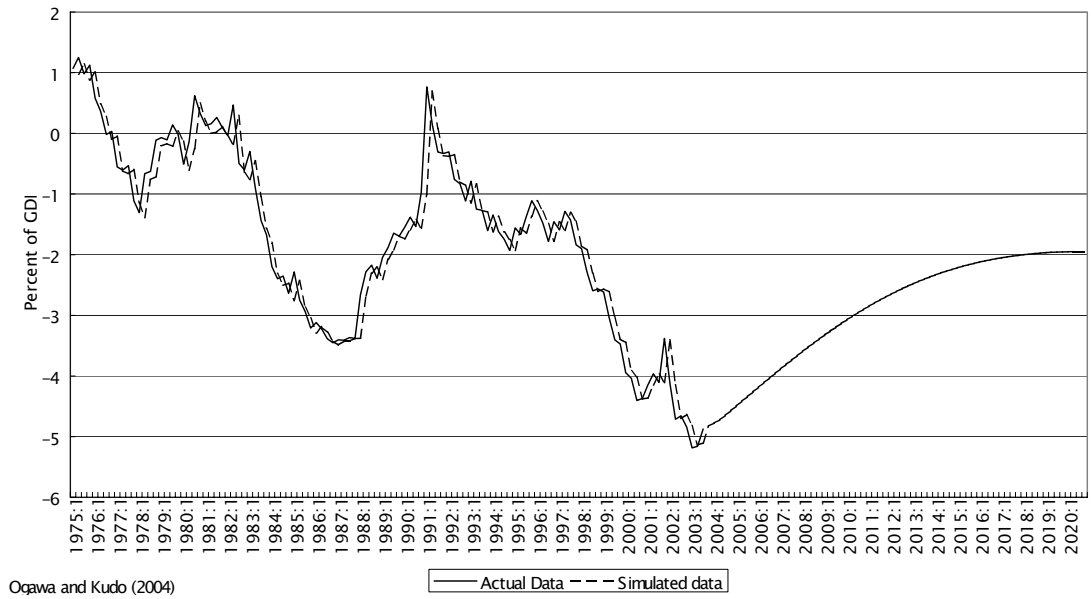
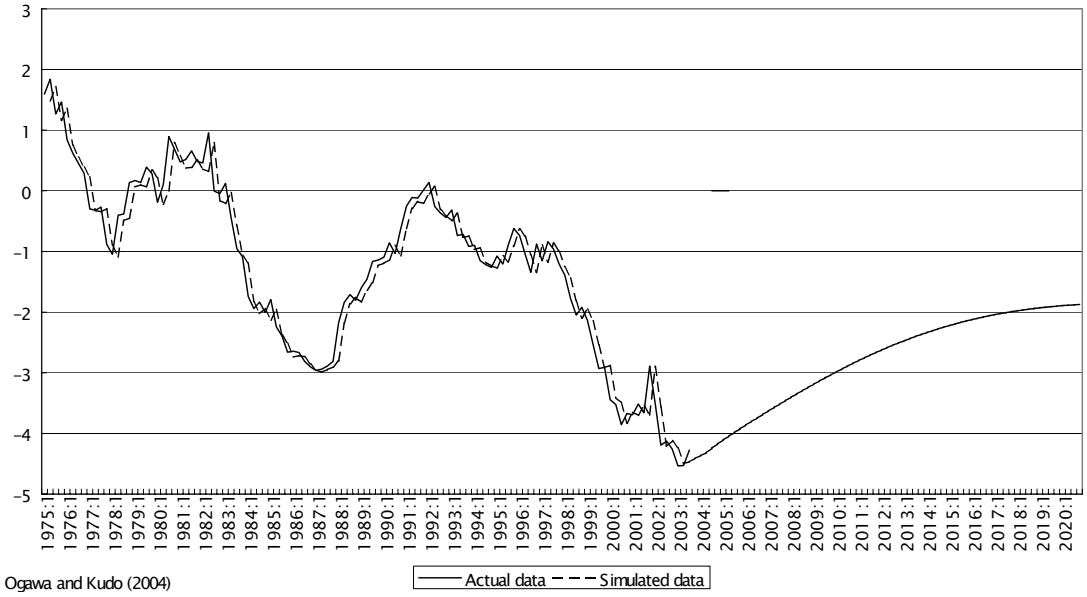



**Figure 4.1: Simulated Current Account Based on Model 1**
**(Case 1: 10% exchange rate depreciation in 2004:2)**



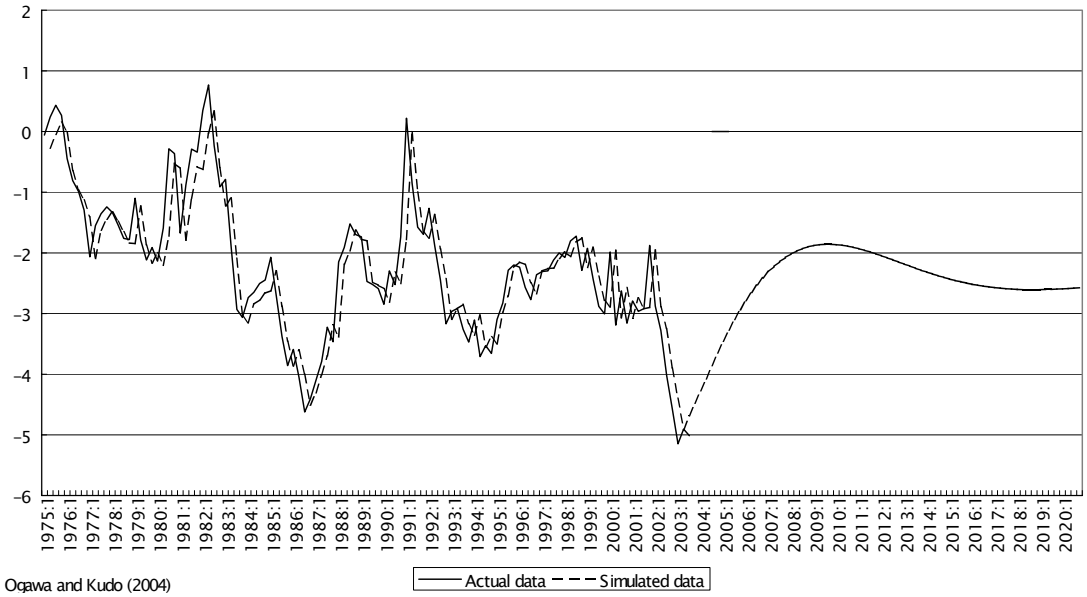

Ogawa and Kudo (2004)

**Figure 4.2: Simulated Current Account Based on Model 2**
**(Case 1: 10%exchange rate depreciation in 2004:2)**



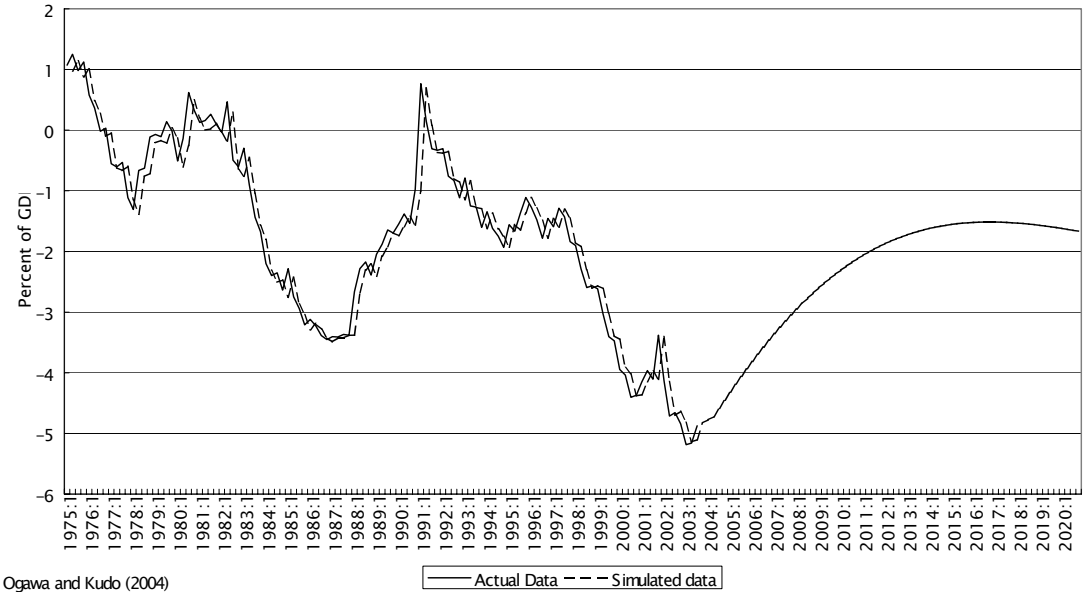

Ogawa and Kudo (2004)

**Figure 4.3: Simulated Current Account Based on Model 3**
**(Case 1: 10%exchange rate depreciation in 2004:2)**



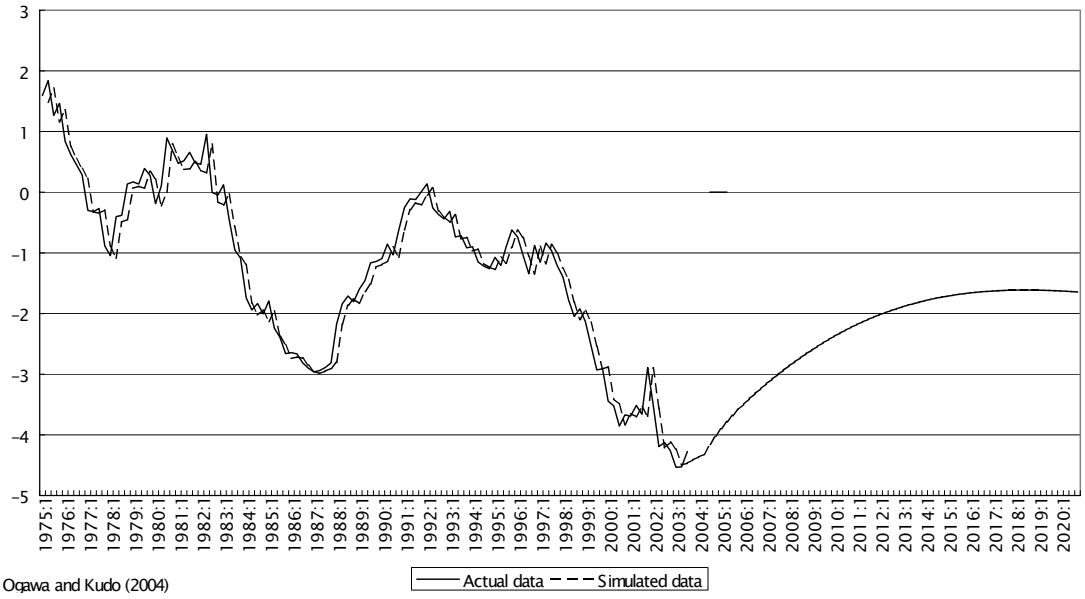

Ogawa and Kudo (2004)

**Figure 5.1: Simulated Current Account Based on Model 1**
**(Case 2: 30%exchange rate depreciation in 2004:2)**



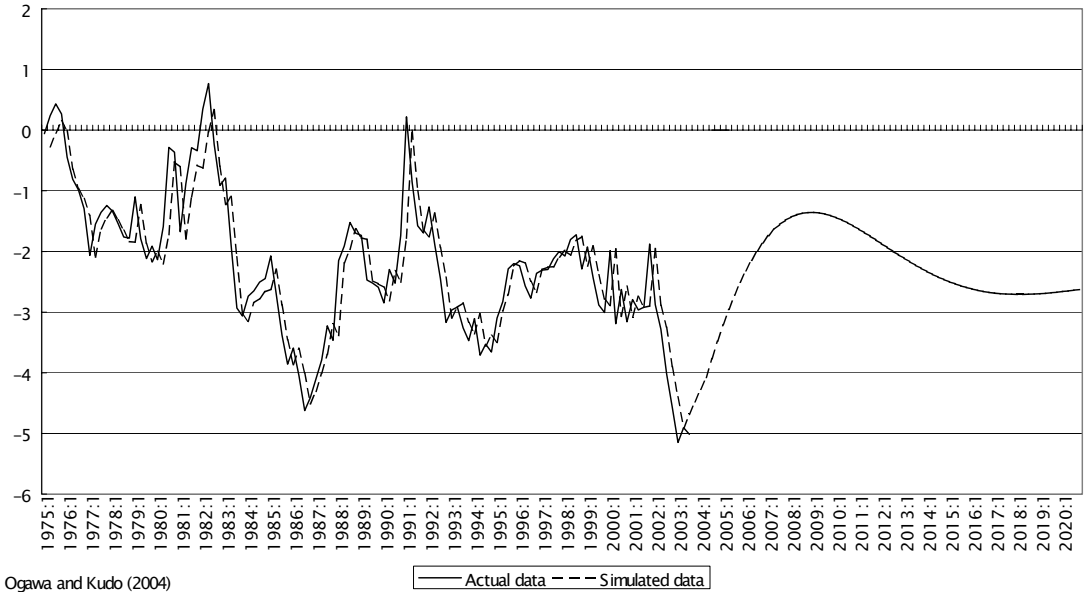

Ogawa and Kudo (2004)

**Figure 5.2: Simulated Current Account Based on Model 2**
**(Case 2: 30%exchange rate depreciation in 2004:2)**



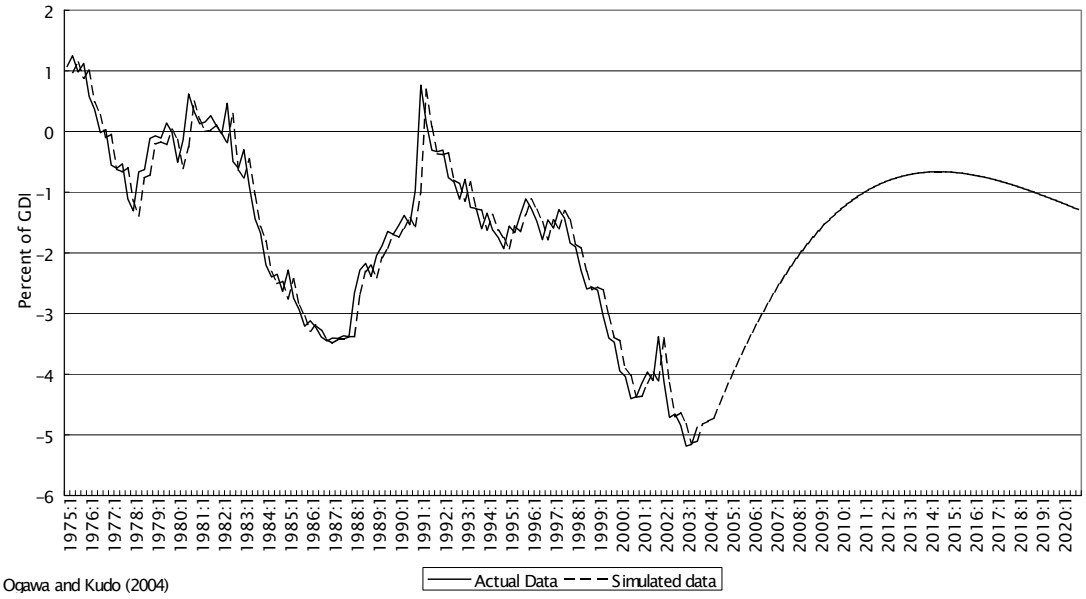

Ogawa and Kudo (2004)

**Figure 5.3: Simulated Current Account Based on Model 3**
**(Case 2: 30%exchange rate depreciation in 2004:2)**



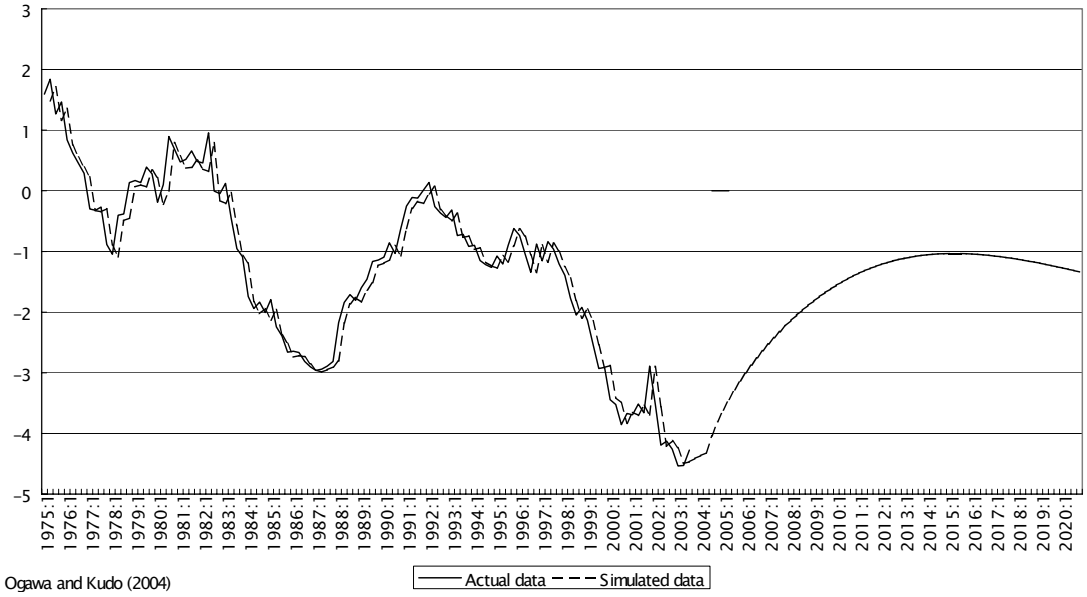

Ogawa and Kudo (2004)

**Figure 6.1: Simulated Current Account Based on Model 1**
**(Case 3: 50%exchange rate depreciation in 2004:2)**



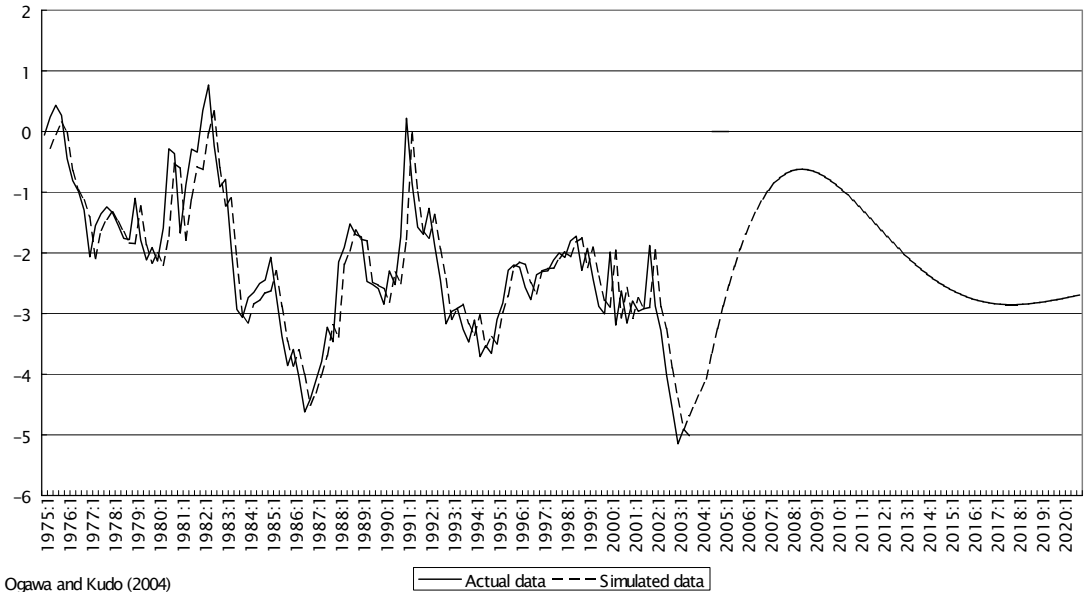

Ogawa and Kudo (2004)

**Figure 6.2: Simulated Current Account Based on Model 2**
**(Case 3: 50% exchange rate depreciation in 2004:2)**




Ogawa and Kudo (2004)

**Figure 6.3: Simulated Current Account Based on Model 3**
**(Case 3: 50% exchange rate depreciation in 2004:2)**




Ogawa and Kudo (2004)