The Japanese yen as an international currency

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1. Introduction

Our experience of the Asian currency crisis tells us some lessons to prevent another currency crisis in the future. One of the lessons is that the de facto dollar peg system is dangerous for the East Asian countries with diversified trade with Japan, the European countries and the intra-region as well as the United States. It is suggested that the monetary authorities of the East Asian countries should target exchange rates of their home currencies vis-à-vis a currency basket consisted of the US dollar and the Japanese yen and so on (Ito, Ogawa, Sasaki (1998), Williamson (2000)). However, they have tended to stabilize exchange rates vis-à-vis the US dollar instead of those vis-à-vis a currency basket. It is said that the reason is because the US dollar has been in general accepted as a key currency as well as an international currency in the world economy while the Japanese yen has been not so often used as an international currency.

In this paper, we recognize that internationalization of the Japanese yen should make sense from an international viewpoint that the East Asian countries should adopt their optimal exchange rate system in order to prevent another currency crisis in the future. We use some data to know about a current status of the Japanese yen as an international currency. We can find that the Japanese yen has not yet been in a status as an international currency.

Next, we study characteristics of the present international monetary system to explore
any measures to enhance an international role of the Japanese yen. We explain results of our empirical research (Ogawa and Sasaki (1998)) on inertia of the US dollar as a key currency. Moreover, we characterize the present international monetary system as a Gulliver-type, where both network externalities and economies of scale have brought the US dollar into a position as a key currency. Therefore, it is difficult to enhance an international role of the Japanese yen by itself under the present international monetary system where inertia works in a position of the US dollar as a key currency.

We face in a kind of coordination failure that private economic agents fail to coordinate with each other in using the Japanese yen as an international currency because of network externalities in using the US dollar as a major international currency in the world economy. We have to solve the coordination failure to use the Japanese yen as an international currency at least in the East Asian region. Although the Japanese government recently has taken some measures, they are regarded as a necessary condition for further internationalization of the Japanese yen. We have to solve the coordination failure to satisfy a sufficient condition for further internationalization of the Japanese yen. It is necessary for us to gain any momentum for further internationalization of the Japanese yen.

In this paper, we suggest that free trade agreements among Japan and other East Asian countries including Korea and Singapore might gain a momentum to further internationalization of the Japanese yen. We should face in foreign exchange risks of
exchange rates of their home currencies vis-à-vis the Japanese yen that impede international trade transactions and direct investments even after we remove tariff and non-tariff barrier under free trade agreements. We will come to care about the exchange rates vis-à-vis the Japanese yen. Moreover, if free trade agreements include a clause on international monetary cooperation of using their own currencies as a settlement currency in their bilateral trade and financial transactions, the free trade agreements are expected to give a stronger momentum to further internationalization of the Japanese yen.

The rest of this paper is organized as follows: Section 2 gives us fact-findings on a current status of the Japanese yen as an international currency by using some data related with invoice and denomination currencies in international trade and financial transactions. Section 3 explains the needs to internationalize the Japanese yen from an international viewpoint. Section 4 shows a result of the empirical analysis (Ogawa and Sasaki (1998)) on inertia of a position of the US dollar as the key currency because we should study the present international monetary system before we consider necessary to internationalize the Japanese yen. In Section 5, the international monetary system is characterized as a Gulliver-type of international monetary system. In Section 6, we showed obstacles to further internationalization of the yen and discuss measures to enhance an international role of the Japanese yen. We conclude our discussion in Section 7.
2. A current status of the Japanese yen as an international currency

In Japan, we have had several discussions about internationalization of the Japanese yen since the so-called Yen-Dollar Working Group (officially the Joint Japan-US Ad Hoc Group on Yen-Dollar Exchange Rate, Financial and Capital Market Issues) submitted a report on internationalization of the Japanese yen in 1984. The report recognized that internationalization of the Japanese yen needed both liberalization and internationalization of Japanese financial markets for market participants in order to choose freely the Japanese yen when they finance money and invest financial instruments. The report suggested some measures of deregulating the domestic financial markets and the euro-yen markets and internationalization of Tokyo financial markets. Concretely, short-term Treasury bill and government bond markets and offshore markets in Tokyo financial markets were established.

“The impact of these steps on the demand for yen as a medium of exchange and a portfolio investment, however, was quantitatively rather limited” as Ito (1992, p.329) pointed out.

We use some data to look at a current status of the Japanese yen as an international currency. At first, we compare relative uses of the Japanese yen in the world economy with some relative economic sizes of Japan. Next, we look at movements of relative uses of the Japanese yen in both international trade and financial transactions.

Figure 1 shows relative economic sizes and relative uses of major currencies including the US dollar, the Japanese yen, and the EU country currencies by assuming that figures in
terms of the EU country currencies sum to a figure in terms of the euro with a simple calculation. In Figure 1, shares of the US dollar, the EU 15 country currencies, and the Japanese yen in several measures of an invoice currency are compared with their relative economic sizes. It shows that the Japanese yen has not yet been internationalized relative to several sizes of the Japanese economy while the US dollar and the EU country currencies are used as international currencies relative to their economic sizes. Thus, the Japanese yen might become a “junior partner” as forecasted by Bergsten (1997) after the successful launch of the euro would make the euro the second key currency in the world economy in a near future.

Figure 2 shows shares of the United States, the EU 15 countries, and Japan in the world trade and each of trading areas, where a trade volume is equal to a sum of exports and imports. We can find differences in trade shares among trading areas. Shares of the United States are very extremely high in the Western Hemisphere, which includes NAFTA and Latin American countries. Shares of the EU countries are very high in Europe, which includes the EU, the EFTA, and other Europe, and Africa. Also, its share is relatively high in the Middle and Near East. It is only in Asia and Oceania that Japan has a relatively high share in the international trade. However, the shares of Japan in the regions are almost the same with those of the United States and even those of the EU countries.

The facts shown in Figure 2 imply that the US dollar would keep a position as a single
key currency at least in the NAFTA and the Latin America while the euro would be used as a single key currency in Europe. On the other hand, it is difficult for the Japanese yen to become a single key currency even in the East Asia region from a viewpoint of international trades.

Figure 3 shows movements in shares of the Japanese yen invoiced transaction in each of exports and imports of Japanese domestic firms. A share of the Japanese yen invoiced transactions in Japanese exports had a peak on March 1993. The peak was two years ahead of a turning point when the exchange rates of the Japanese yen in terms of the US dollar changed from appreciation of the Japanese yen to depreciation. The share had been increasing before the turning point in April 1995. However, the share has decreased since then. Also, a share of the Japanese yen invoiced transactions in Japanese imports had a peak on March 1995. The share had been increasing before March 1995 and it has decreased since then as it followed movements in the nominal effective exchange rate of the Japanese yen.

Figure 4 shows shares of denomination currencies in international money market instruments. A share of the US dollar denominated international money market instruments has decreased from 79 percent in 1993 to 43 percent in 2000. A share of the Japanese yen denominated international money market instruments has been small but has increased from 0.3% in 1993 to 2.6% in 2000. A share of those denominated in terms of the euro area currencies, that included the EU 11 country currencies and the ECU before the introduction
of the euro in January 1999, has increased from 10% in 1993 to 32% in 2000.

Figure 5 shows shares of denomination currencies in international bond market. A share of the US dollar denominated international bonds and notes has increased from 38 percent in 1993 to 47 percent in 2000. A share of the Japanese yen denominated international bonds and notes has decreased from 14 percent in 1993 to 10 percent in 2000. A share of the euro area currencies denominated international bonds and notes has increased a little from 26 percent in 1993 to 29 percent in 2000. Especially, the share of the euro area currencies has increased much more after the EU countries introduced the euro in 1999.

Figure 6 shows shares of denomination currencies in liabilities in terms of foreign currencies of international banks during a period from 1983 to 1999. A share of the US dollar denomination decreased from 79 percent in 1984 to 49 percent in 1995. However, it has recently increased to 64 percent in 1999. A share of the Japanese yen denomination has gradually increased from 2% in 1983 to 8% in 1999. A share of the euro area currencies denomination increased from 12 percent in 1983 to 30 percent in 1993. Afterward, it has gradually decreased in 1990s. After the currency unification, it is 12 to 14 percent in 1999.

Thus, the Japanese yen is more likely to be used as a denomination currency in the longer-term capital markets than in the shorter-term money markets. The fact implies that the Japanese yen might have a relative advantage in using it as a means of a store of value. On one hand, not so much of the Japanese yen is used in money markets in which liquidity is
regarded to be important. The Japanese yen has a disadvantage in using it as a medium of exchange, which is implied by liquidity.

Frankel and Wei (1994) and Kawai and Akiyama (1998) empirically analyzed how strong correlation movements in some Asian currencies other than the Japanese yen have with movements in the US dollar and those in the Japanese yen before the Asian currency crisis. Their empirical analyses had a common result that the movements in most of the analyzed Asian currencies had a strong correlation with the movements in the US dollar and a weak correlation with those in the Japanese yen as shown in Table 1. The results showed that the monetary authorities of these countries had adopted a de facto dollar peg system before the currency crisis. For example, the monetary authorities of Thailand had de facto pegged the Thai baht to the US dollar although they announced to peg it to a currency basket that consisted of the US dollar, the Japanese yen, and other major currencies.

The monetary authorities of some East Asian countries had switched their exchange rate system to a managed floating exchange rate system when they faced in the Asian currency crisis though the monetary authorities of Malaysia have adopted the dollar peg system since September 1998. For some time after the crisis, the East Asian currencies had weaker correlation with the US dollar and stronger correlation with the Japanese yen. However, we can find that some of the East Asian currencies have returned to de facto pegging their home currencies to the US dollar since late 1998 as shown in Figures 7.
Some factors are pointed out as reasons why the monetary authorities of East Asian countries adopted or adopt such a de facto dollar peg. One of the factors is that the US dollar has been historically used as a major settlement currency in international trade and financial transactions. The monetary authorities that care about foreign exchange risks of exchange rates of their home currency vis-à-vis the US dollar tend to adopt a dollar peg system. Another factor is that the monetary authorities believed that they had to keep a dollar peg system in order to keep market participants’ confidence or international and domestic confidence in their home currencies. They understood that a sudden devaluation of their home currencies might lose their confidence in the currencies. The monetary authorities pegged their own currencies to the US dollar rather than other currencies including the Japanese yen because they recognized that the US dollar is a key currency in the world economy.

3. The Need to Internationalize the Japanese yen: International Perspectives

The Japanese Council on Foreign Exchange and Other Transactions (1999) pointed out some needs to internationalize the Japanese yen from international perspectives as well as from Japanese domestic perspectives. It stressed that internationalization of the Japanese yen would contribute to both the stability of the international monetary system and economic stability in East Asia from international perspectives.
Following the collapse of the Bretton Woods system, the major developed countries have adopted a floating exchange rate system since 1973. Even while it has continued to lose its value relative to other major currencies, the US dollar remained a key currency throughout this period. This has been highly influenced by the general confidence in the US dollar as supported by the international political leadership exercised by the US governments, and by the forces of inertia generated by the convenience of the US dollar as an international currency. On the other hand, it has been pointed out that this situation has allowed the United States to adopt an economic policy of “benign neglect” toward foreign exchange markets. However, the United States continues to run massive current account deficits and stands as the largest net debtor country in the world. The fact implicitly threatens the present international monetary system with the single key currency based on the US dollar.

The US dollar, the euro, and the Japanese yen support the three major economic regions in the world. As such, the euro representing Europe and the Japanese yen as the principal Asian currency are in a position to complement the US dollar. Such complementary arrangements can contribute to the establishment of a stable international monetary system supported by the sound economic policies of the United States, the European Union, and Japan. Furthermore, from the perspective of diversifying the risks inherent in floating rate systems, it is desirable to promote the international use of the Japanese yen along with the US dollar and the euro. In this regard, the internationalization of the Japanese yen can be
viewed to represent the provision of an international public good.

While the Asian region has developed strong economic relations with Japan, the United States, and Europe, its ties with Japan are very strong in overall terms, covering all aspects of trade, direct investment, capital transactions, and economic assistance. As a reaction to the recent currency crises, Asian countries are showing interest in reconsidering the role of the Japanese yen and are calling for the expansion of its international role.

We learned some lessons from the Asian currency crisis that occurred in 1997. One of the lessons is that the de facto dollar peg system was a dangerous exchange rate system for the East Asian countries trade significantly with Japan, the EU, and the intra-region as well as the United States. If the monetary authorities of the East Asian countries had adopted a currency basket peg system instead of the de facto dollar peg system, they would not have experienced appreciation in their effective exchange rates, speed-down of export growth and worsening of current accounts (Ito, Ogawa, and Sasaki (1998)). Moreover, the de facto dollar peg system stimulated capital inflows to the East Asian countries before the crisis because domestic banks and firms tended to be careless about exchange rate risks under the de facto dollar peg system (Ogawa and Sun (2000)).

One of the reasons why the monetary authorities adopted the de facto dollar peg system is that it is not the Japanese yen but the US dollar that is generally accepted as an international currency in the world economy. Some of the monetary authorities believe that
they can keep confidence of their own currency by pegging it to the US dollar. Also, they care about exchange rate risks of exchange rates of their home currency vis-à-vis the US dollar in international trade transactions, foreign direct investments, and international financial transactions. Therefore, enhancing an international role of the Japanese yen in international economic transactions will contribute to the stability of foreign exchange markets of the East Asian currencies and, in turn, to the stability of East Asian economies.

Moreover, using the Japanese yen more frequently as a settlement currency in international economic transactions would decrease foreign exchange settlement risks (so-called Herstatt risks, namely, risks that arise from intraday time-zone differences in settlement) in cross-border foreign exchange transactions in the East Asian region because the time difference between Japan and other East Asian countries is less than that between the countries and either the United States or Europe.

4. Inertia of the key currency

We should study the present international monetary system before we consider necessary measures to promote internationalization of the Japanese yen. The US dollar has had a steady trend to depreciate against the Japanese yen and the Deutche mark since the international monetary system was changed from the US dollar standard system to a general floating system in 1973. We should recognize that both official authorities and private
economic agents in the world have still accepted and used the US dollar as a key currency under the present international monetary system.

The fact is very important when we consider issues on an international monetary system and a status of the US dollar and the Japanese yen as an international currency. The issues include what function of an international currency has been regarded to be the most important in becoming a key currency and what factors could contribute to switching one key currency into another. An international currency has three functions of a medium of exchange, a store of value, and a measure of value in an international economic context like a domestic currency in a domestic economic context.\(^1\) The fact that the depreciating US dollar has kept a position as a key currency implies that a function of money as a medium of exchange is in general recognized to be more important than its function as a store of value when we choose an international currency in international economic transactions.

Ogawa and Sasaki (1998) empirically analyzed how much inertia the US dollar has in its position as a key currency by taking account of both the function as a medium of exchange and a store of value in a context of international currency competition. We supposed that we could enjoy benefits of a medium of exchange function by holding real balances of international currencies while we expensed costs of holding depreciating international currencies. We assumed a money-in-the-utility model where real balances of international currencies.

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\(^1\) See Krugman (1984).
currencies were introduced to a utility function of private economic agents. We specified a Cobb-Douglas type of utility function:

\[
U(c, m_A, m_D, m_Y) = \int_0^\infty U(c, m_A, m_D, m_Y) e^{-\delta t} dt
\]

\[
U(c, m_A, m_D, m_Y) = \frac{c^\alpha \left( m_A^{1-\beta} \left( m_D^{\beta} m_Y^{1-\gamma} \right)^{1-\beta} \right)^{1-\alpha}}{1-R}
\]

where \( c \): real consumption, \( m_A \): real balance of home currency, \( m_D \): real balance of the US dollar, \( m_Y \): real balance of other international currencies.

From the first-order conditions for utility-maximization subject to intertemporal budget constraints that include payments of seigniorage to foreign monetary authorities, we derive optimal real balances of international currencies. An optimal share of the US dollar \( \phi \) is derived:

\[
\phi_i = \frac{m_D}{m_D + m_Y} = \frac{1}{1 + \frac{1-\gamma \pi_y}{\gamma \pi_i + \bar{r}}} = \frac{1}{1 + \frac{1-\gamma \pi_y}{\gamma \pi_i + \bar{r}}}
\]

where \( i \): nominal interest rate, \( \bar{r} \): real interest rate, \( \pi \): inflation rate.

We focused on a parameter \( \gamma \) on the real balance of the US dollar in the utility function. We estimated the parameter \( \gamma \) during the analytical period from the first quarter of 1986 to the second quarter of 1993 by supposing that the other international currencies included the Japanese yen and the Deutche mark. The empirical study had a result that is shown in Table 2. The result showed that the parameter \( \gamma \) on the real balance of the US dollar in the
utility function was about 0.7 and, in turn, that marginal rates of substitution were relatively low between the US dollar and the other currencies. The result implies that the US dollar has had an overwhelming function as a medium of exchange compared with other currencies, given the depreciation of the US dollar.

Also, Ogawa and Sasaki (1998) simulated relationships between inflation rates in the United States or a depreciation rate of the US dollar and a share of the US dollar in the international currencies, given the estimated value of the parameter\(^2\). Figure 8a and 8b shows the simulated relationships between US inflation rates and shares of the US dollar, given inflation rate in Japan and Germany. The simulation analysis brought us a result that a share of the US dollar in the international currencies would suddenly make no substantial changes even though the inflation rates in the United States or the depreciation rate of the US dollar occurred at a level of a single-digit percentage. It might be concluded that the US dollar should experience no sudden fall in its position as a key currency as long as it maintains its overwhelming function as a medium of exchange.

Thus, the US dollar would not change in its position as a key currency as long as it has an advantage as a medium of exchange compared with other currencies. This would be true even if the US dollar depreciated at a moderate rate. The US dollar would keep its

\(^2\) We used nominal interest rate and inflation rate means data during the analytical period (the first quarter of 1986 to the second quarter of 1993). The used weighted average of interest rates for Japan and Germany is 6.52%. The used weighted averages of Japan and Germany inflation are 0.55% for WPI and 2.45% for CPI.
international advantage in the present situation. Other currencies such as the Japanese yen might have the power to compete with the US dollar in a function as a store of value. However, a relative advantage in the function as a store of value is not sufficient for the Japanese yen in order to compete effectively with the US dollar. Rather, it is necessary for the Japanese yen to improve their function as a medium of exchange or convenience in using it as a settlement currency and an invoice currency in international trade transactions. Both a search theoretic model and a random matching model in a context of international currencies tell us that an international currency, volume of that is overwhelmingly large in settlements of international trade, used as a medium of exchange in international transactions.

A function of an international currency as a medium of exchange depends on a degree of its general acceptability among economic agents in the world. A currency is held to use as a medium of exchange although we cannot enjoy direct utility by consuming it in contrast with goods and services in general. The reason is only that the currency is accepted and received as a medium of exchange by trading counterparts. Moreover, the trading counterparts also are willing to purchase ultimately goods and services by passing the currency to any other economic agents. Therefore, the general acceptability depends on a probability that an economic agent who holds a currency to purchase goods and services can meet another

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3 Matsuyama, Kiyotaki, and Matsui (1993) and Trejos and Wright (1996) applied a random matching model to a theoretical analysis of international currencies.
economic agent who is willing to accept the currency to sell goods and services.

Thus, the function of a currency as a medium of exchange depends on whether other economic agents are willing to use it as a medium of exchange, or how many other economic agents are willing to use it as a medium of exchange. In other words, its function as a medium of exchange improves itself as a number of other economic agents that are willing to use it. Thus, it is said the function as a medium of exchange has network externalities\(^4\). Because such network externalities exist in monetary exchange system, a currency, a degree of general acceptability of which has been historically high, might in itself enhance its general acceptability.

This implies that economies of scale work in a medium of exchange. In the case of economies of scale, benefits of holding a key currency with a dominantly large share in the international currencies are clearly larger than those of holding any other currencies with a small share are. Moreover, the higher share of the key currency enlarges gaps in the benefits between the key currency and other currencies. Therefore, the key currency with a dominantly large share would enhance its own share as long as monetary authorities supply the currency at a relatively low growth rate and control inflation rates at a relatively low level. Once a currency becomes a key currency with a dominantly large share, the currency would keep its position as a key currency unless the monetary authorities bring about a large

depreciation of the currency. Thus, a historical fact that a currency became a key currency makes the currency keep its position as a key currency. Thus, inertia works in a position as a key currency.

It is desirable that a key currency has both the functions as a medium of exchange and as a store of value. However, a key currency might not have a sufficient function as a store of value because the monetary authorities are able to seek to obtain seigniorage by issuing the currency into the world economy.

The US dollar has been in a position as a key currency during this century. Under the Bretton Woods system, the monetary authorities of countries other than the United States had to link their own currencies to the US dollar while the monetary authorities of the United States had to link the US dollar to gold. All of the economic agents in the world were enforced to approve a position of the US dollar as a key currency. Therefore, public and private economic agents in the world had to use the US dollar as a key currency even though the US dollar have had a trend of depreciation and have been losing its function as a store of value. On the other hand, all economic agents in the world have not been enforced to approve the US dollar to be a key currency since the Bretton Woods system collapsed in 1971. They have freedom to choose another currency as well as the US dollar as a key currency if they wish. They would be able to choose a multi international currency system where there exist more than two international key currencies.
Under the multi international currency system, it is free for private economic agents in the world to choose to use only one currency or more than two currencies as their international key currencies by comparing between both the functions as a medium of exchange and as a store of value. Private economic agents in the world should choose a key currency by taking into account which function they regard to be more important in using as an international currency. The US dollar has taken relatively an advantage of a function as a medium of exchange rather than a function as a store of value. On one hand, the Japanese yen has taken relatively an advantage of a function as a store of value rather than a function as a medium of exchange. The inertia in a position of the US dollar as a key currency shows that private economic agents in the world have chosen the US dollar as a key currency from a viewpoint of a function as a medium of exchange.

5. A Gulliver-type of international monetary system

Here, we have to take into account a competition condition in such a multi international currency system when we consider a possibility of switching from one key currency to another. A condition where private economic agents are able to choose freely a key currency in a multi international currency system does not necessarily imply that the multi international currencies are effectively competing with each other. Both the network externalities and the economies of scale should lead to a natural monopoly condition in
international currency competitions. A function of an international currency as a medium of exchange is enhanced as a volume of trade by means of the international currency increases in itself. The volume of trade by means of the international currency tends to be positively related with its volume of supply in the world economy. Thus, an increase in an international currency improves its quality in a function of a medium of exchange.

The quality of an international currency in the function as a medium of exchange depends on a relative volume in circulates of the international currency or a share of the international currency in the world economy. According to the relationship between the quality of an international currency and the share of the international currency in the world economy, international currencies with different shares in the world economy are heterogeneous in the function as a medium of exchange. Thus, the international currencies with different shares are imperfect substitutes.

An international currency with a relatively high share should have a relatively better quality in the function as a medium of exchange. On the other hand, an international currency with a relatively low share should have a relatively worse quality in the function as a medium of exchange. An international currency that has extremely high share in the world economy like the US dollar should have quite a different quality from other currencies. Such a key currency tends to increase a degree of differentiation among the key currency and other currencies. We can call such an international monetary system as a Gulliver-type of
international monetary system. It is difficult for the other currencies to compete with the key currency as much as competition in markets of homogeneous goods.

It is unlikely that a continuous depreciation of the US dollar would change the present Gulliver-type of international monetary system into another system with effective currency competition because inertia works in a position of the US dollar as a key currency. However, if there were any competitive international currencies other than the US dollar, the US dollar could not receive monopoly profits that it has received in the present situation of a single key currency.

All the economic agents, who hold a balance of a foreign currency to use the foreign currency as a key currency, are enforced to pay seigniorage to the foreign monetary authorities. If the foreign monetary authorities seek to obtain their seigniorage from all the economic agents who hold a balance of the foreign currency, the authorities might grow the volume of currency at very high rate. As a result, the currency would depreciate against other currencies.

However, if the currency effectively competed with other international currencies, economic agents in the world economy could switch holdings of international currency from the depreciating currency to an appreciating currency. Moreover, if there is high substitutability among international currencies, it is easier for economic agents to switch holdings of international currency. After they switch holdings of international currency to
another currency, the monetary authorities that sought to obtain their seigniorage could in fact obtain a smaller amount of the seigniorage than they expected.

Therefore, the monetary authorities should not grow the volume of currency at too high a rate. Rather, the monetary authorities should grow it at an optimal rate to maximize their seigniorage. The optimal growth rate depends on a competition condition among international currencies. That is, the monetary authorities should grow it at a lower rate, as a competition condition becomes more severe. Thus, if a key currency effectively competed with other currencies, the effective currency competition could prevent the monetary authorities of the key currency from growing its volume at too high a rate and, in turn, depreciating it against other currencies.

Under the Gulliver-type of international currency system, it is difficult for the other currencies to compete effectively with the US dollar because the US dollar and the other currencies, which have included the Japanese yen and the Deutche mark, have been considerably heterogeneous. It is necessary that the other currencies have as much share as the US dollar in order to compete effectively with the US dollar. In other words, an international currency, which has as much share as the US dollar, would be able to compete with the US dollar effectively.

However, it is unlikely that a share of the US dollar naturally decreases and shares of the other currencies increase under the present Gulliver-type of international monetary
system, as showed by the simulation analysis of Ogawa and Sasaki (1998). If we experienced some large shocks in the Gulliver-type of international currency system, the shares of the international currencies would change by themselves.

One of the shocks is a significant improvement in convenience of using any international currencies other than the US dollar as a medium of exchange. According to the theory of network externalities, convenience of using an international currency as a medium of exchange depends on how many economic agents in the world use it as a medium of exchange. Therefore, it is sure that one of the shocks that could improve its function as a medium of exchange for an international currency would be a monetary integration among countries such as the European monetary union.

6. Measures to enhance an international role of the Japanese yen

It is difficult for the Japanese yen to be internationalized further only by relying on only a function of the Japanese yen as a store of value under the present Gulliver-type of international monetary system, where inertia has worked in a position of the US dollar as a key currency. It is necessary that a function of the Japanese yen as a medium of exchange should be enhanced in order to become such an international currency that is able to compete with the US dollar together with the euro.

The measures of financial market deregulation and establishment of the Tokyo offshore
financial markets, which the so-called yen-dollar working group suggested in the report on internationalization of the J apanese yen, have had little effects on internationalization of the J apanese yen. Only the deregulations could not internationalize the J apanese yen as such an international currency that is able to compete effectively with the US dollar.

The US dollar has had an advantage in a function as a medium of exchange while it has had a disadvantage in a store of value because of its depreciation. Private economic agents in the world hold and use the US dollar by taking account of both the advantage and the disadvantage of the US dollar. Thus, deregulation of J apanese financial markets is a necessary condition but not a sufficient condition for further internationalization of the J apanese yen. It is necessary for the J apanese yen to improve a function as a medium of exchange by taking the measures of financial market deregulation and establishment of the Tokyo offshore financial markets. We have to consider about measures that satisfy not only necessary conditions but also sufficient conditions for further internationalization of the J apanese yen.

As explained above, inertia has worked in using the US dollar as a key currency. The inertia of a position of the US dollar as a key currency should reflect in normal business practice in international trade transactions. The normal business practice prevents private economic agents in the world from using the J apanese yen as a settlement currency in international trade and financial transactions. As the normal business practice, in itself, has
network externalities, it is difficult to change the normal business practice and, in turn the inertia of a position of the US dollar as a key currency.

However, it is recently said that Japanese subsidiaries in Asian countries are enforced to make a settlement in trading with their parent companies by using the Japanese yen because the parent companies are willing to transfer foreign exchange risk to their subsidiaries. Such a movement in a settlement currency to the Japanese yen might increase a share of the Japanese yen used as a denomination currency in international lending and borrowing from a viewpoint of natural hedging of foreign exchange risk. Thus, it seems to begin a gradual shift of a settlement currency to the Japanese yen. Therefore, the Japanese governments should remove some obstacles of regulation and taxation that both of the domestic and foreign private economic agents come against with when they use the Japanese yen as a settlement currency in international trade and as a denomination currency in international lending and borrowing. The measures should be necessary for further internationalization of the Japanese yen.

The Japanese Ministry of Finance recognized that various environmental and infrastructure improvements were necessary for the promotion of internationalization of the Japanese yen. Particular importance was assigned to measures for increasing market depth in the short-term financial markets and arrangements for facilitating investment in Japanese government bonds by overseas investors.
The Japanese government announced some measures in financial markets and implemented necessary arrangements in legal and other framework in order to facilitate the internationalization of the Japanese yen (Council on Foreign Exchange and Other Transactions (1999)). The measures are outlined below:

(A) A competitive price auction of Financing Bills began in April 1999.

(B) Original issue discounts for Treasury Bills and Financing Bills issued on or after April 1999 which satisfy requirements, including registration of all bonds in the Bank of Japan book-entry system at the time of their issuance, are exempt from withholding taxes at the time of issuance, and foreign corporations are, in principle, exempt from taxes on original issue discounts for such bonds.

(C) Interest income of non-residents and foreign corporations accrued from interest-bearing Japanese government bonds which satisfy requirements, including registration in the BOJ book-entry system, and whose period for interest calculation begins on or after September 1999 are exempt from withholding taxes.

(D) To further diversify the maturities of government bonds, thirty-years Japanese government bonds and one-year Treasury Bills were introduced beginning in 1999. Moreover, five-years and fifteen years Japanese government bonds were introduced in 2000.

As for the exemption of withholding taxes of Japanese government bonds held by
non-residents, it is sometimes said that the requirements are so rigid that it has been still
difficult for non-residents to hold the Japanese government bonds. Therefore, the Japanese
government should improve implementation for the exemption of withholding taxes on
Japanese government bonds.

Also, the Bank of Japan is now preparing for rebuilding systems in order to start a Real
Time Gross Settlements for the Japanese government bonds January 2001. It is pointed out
that it is necessary to increase thickness and liquidity in financial markets in term of the
Japanese yen in order to improve availability in funding money, investing financial
instruments, hedging foreign exchange risks and interest risks. Concretely, the Japanese
government should issue more variety of government bonds because there is a correlation
between thickness of markets and variety of financial instruments traded in the markets.
The government might give private banks any incentives in order that the private banks
should develop and supply financial instruments for hedging the foreign exchange risks and
other risks.

We should consider how to internationalize the Japanese yen in a condition where inertia
works in using the US dollar because of network externalities. The government failed to
promote the Japanese yen denominated banker’s acceptances in the past. It would succeed to
promote them in the present condition where Japanese banks have difficulties to fund the
US dollar in international money markets. However, we should never forget that the
network externalities keep the US dollar in a position as a key currency. We should consider measures to go beyond the inertia of the US dollar as a key currency. It is necessary to gain any momentum in order to change a condition where the network externalities support the inertia. The network externalities lead to a situation that economic agents keep using a current international currency because all of them fail to coordinate to change from the current international currency to another currency although they recognize that the current situation is not optimal. Therefore, one of the measures is that the Japanese government gives private economic agents both any momentums to make a coordination and any incentives to use the Japanese yen in international trade and financial transactions.

In promoting internationalization of the Japanese yen, it is the most realistic to begin with efforts aimed at boosting the use of the Japanese yen in the East Asia region that shares very strong economic ties with Japan. The active use of the Japanese yen in the process of Asia’s recovery from the currency crisis and its return to its stable growth path would provide a potent impetus to enhancing the international position of the Japanese yen. For this purpose as well, it is important that Japan rapidly expand its ties with the real aspects of Asian economies through trade and capital transactions. Such transactions would supply the Japanese yen to the East Asian region and establish a foundation for circulation of the Japanese yen in international trade and financial transactions.

Japan is now studying about effects and feasibility of bilateral free trade agreements
with Korea and Singapore at the same time. Bilateral free trade agreements are complementary to a multilateral trade arrangement represented by the WTO. It is expected that bilateral free trade agreements between Japan and each East Asian country would strengthen their trade and financial relationships. Economic agents of these countries should face in foreign exchange risks of exchange rates of their home currencies vis-à-vis the Japanese yen that impede international trade transactions and direct investments even after we remove tariff and non-tariff barrier under free trade agreements. The economic agents will have to cope with the foreign exchange risks against the Japanese yen and the monetary authorities will come to care about the exchange rate vis-à-vis the Japanese yen.

The movements toward bilateral free trade agreements might gain momentum to use the Japanese yen as an international settlement currency if Japan and the partner country have an international cooperation in an international monetary field. For example, if the free trade agreements include a clause that government and private sectors in both Japan and the partner country should make efforts to use their own currencies in their bilateral trade and financial transactions, the clause might gain the momentum of using the Japanese yen as a settlement currency at least in their transactions. Moreover, Japan and the partner country have another international monetary cooperation that they can try to create a foreign exchange market for the Japanese yen and the partner country’s home currency.

Thus, the Japanese government should try to conclude free trade agreements with many
countries in East Asia including the international monetary cooperation that contributes to
gaining momentum of further internationalization of the Japanese yen. The free trade
agreements are expected to contribute to further internationalization of the Japanese yen
through strengthening trade and financial relationships among Japan and East Asian
countries as well as through the direct international monetary cooperation.

From the lesson of the Asian currency crisis, the monetary authorities of East Asian
countries should adopt a currency basket system instead of the de facto dollar peg system
(Ito, Ogawa, and Sasaki (1998)). However, they have not adopted a currency basket system
that places a heavier weight on the Japanese yen because of the fact that the Japanese yen
has not yet internationalized enough to use it in settlements of international transactions.
From this point of view, we acknowledge the importance of increased use of the regional
currencies in intra-Asian trade and financial transactions and, in particular, enhanced
international role of the Japanese yen.

7. Conclusion

The de facto dollar peg system, which the monetary authorities in some of Asian countries
had adopted before the Asian currency crisis, is pointed out to be a cause of the Asian
currency crisis. Under the de facto dollar peg system, the depreciation of the Japanese yen
against the US dollar and, in turn, their home currencies decelerated their growth rates of
exports and deteriorated their trade balances. The monetary authorities should have adopted an exchange rate policy that was more weighted on stabilizing exchange rates of their currencies vis-à-vis the Japanese yen. However, the monetary authorities, in fact, had adopted the de facto dollar peg system before the Asian economic crisis. Moreover, some East Asian currencies seem to return to being pegged to the US dollar in recent years while the monetary authorities of Malaysia have adopted rigid dollar peg system since September 1998.

The Japanese government has an obligation to remove the obstacles that have prevented the monetary authorities in Asian countries from targeting the home currency to a true currency basket that includes the Japanese yen because the Japanese yen has not yet been internationalized sufficiently. It is sure that the Japanese government would face in difficulties for further internationalization of the Japanese yen under the present Gulliver-type of international monetary system where inertia has been working in using the US dollar as a key currency. However, it should make all possible efforts to take some measures in order to facilitate the internationalization of the Japanese yen.

It is noteworthy that the measures are only necessary conditions for further internationalization of the Japanese yen. The measures should not be any sufficient condition. A sufficient condition for changing the present Gulliver-type of international monetary system is such that the EU countries have integrated their home currencies into a
single common currency, the euro. They will be able to use such a big shock to gain momentum of becoming one of key currencies. In terminology of economics, the European monetary integration implies a possible shift from one equilibrium point to another one in a situation of multi-equilibria. Thus, a sufficient condition is that we should gain momentum for stopping the inertia of the US dollar as a key currency in order to enhance an international role of the Japanese yen.

We should use recent movements toward free trade arrangements to gain momentum of further internationalization of the Japanese yen. We expect that the free trade agreements can contribute to further internationalization of the Japanese yen through strengthening trade and financial relationships among Japan and East Asian countries. Also, we can conclude the free trade agreements that include international monetary cooperation of using our own currencies in our economic transactions or creating foreign exchange markets of our currencies, which are expected to contribute to further internationalization of the Japanese yen.
Appendix: Network externalities and an international currency

In this appendix, we use a simple model with the network externalities to analyze theoretically conditions where the Japanese yen will come to be used as an international currency (Dowd and Greenaway (1993)).

Suppose that there are $n+1$ economic agents in the world economy and that the economic agents use either the US dollar or the Japanese yen to settle international economic transactions. Also, we suppose that each of the economic agents has used the US dollar as a settlement currency by now and that he is about to make a decision of whether he change a settlement currency from the US dollar to the Japanese yen or not. Economic agents compare benefits obtained from convenience of the currency as a medium of exchange with cost of holding the depreciating currency. We assume that they need a constant switching cost $s$ when they change a settlement currency from the US dollar to the Japanese yen.

They are assumed to maximize the following utilities when they choose their settlement currency. A utility related with the network externalities is assumed to be proportional to $n$, a number of other people who use the same currency as a settlement currency. A parameter $a$ represents a utility obtained from an appreciation of the US dollar, independently of the network externalities. $b \times n$ represents a utility of the US dollar related with the network externalities. A parameter $c$ represents a utility obtained from an appreciation of the Japanese yen, independently of the network externalities. $d \times n$ represents a utility of
holding the Japanese yen related with the network externalities.

A utility which an economic agent obtains in the case of where he keeps to settle in terms of the US dollar while any other economic agents switch their settlement currency from the US dollar to the Japanese yen is represented as $u_A$.

$$u_A = a \quad (A.1)$$

We represent a utility that an economic agent obtains if he keeps to settle in terms of the US dollar while any other economic agents keep to settle in terms of the US dollar as $u_{NA}$.

$$u_{NA} = a + bn \quad (A.2)$$

An economic agent obtains a utility $v_A$ when he switches his settlement currency from the US dollar to the Japanese yen at the same time when any other economic agents switch their settlement currency from the US dollar to the Japanese yen.

$$v_A = c + dn - s \quad (A.3)$$

An economic agent obtains a utility $v_{NA}$ if he switches his settlement currency from the US dollar to the Japanese yen while any other economic agents keep settling in terms of the US dollar.

$$v_{NA} = c - s \quad (A.4)$$

An economic agent switches his settlement currency from the US dollar to the Japanese yen if his utility of switching the settlement currency from the US dollar to the Japanese yen is larger than one of keeping settling in terms of the US dollar while any other economic agents
keep settling in terms of the US dollar \( (v_{NA} > u_{NA}) \). Therefore, any other economic agents also
switch the settlement currency from the US dollar to the Japanese yen. The condition of
\( v_{NA} > u_{NA} \) is rewritten:

\[
c - a > s + bn
\]  

Equation (A.5) implies that all economic agents should always switch their settlement
currency from the US dollar to Japanese yen if the net benefit of appreciation of the US
dollar with compared with appreciation of the Japanese yen is larger than a sum of the
switching cost and the benefit of network externalities that will be lost by quitting
settlement in terms of the US dollar.

Suppose a situation where an economic agent has a larger utility of keeping settling in
terms of the US dollar than that of switching his settlement currency from the US dollar to
the Japanese yen while any other economic agents switch their settlement currency from the
US dollar to the Japanese yen \( (v_A < u_A) \). It is clear that the economic agent should keep
settling in terms of the US dollar. Also, any other economic agents keep settling in terms of
the US dollar. This condition of \( v_A < u_A \) is rewritten:

\[
c - a + dn < s
\]  

Equation (A.6) implies that all economic agents should always keep settling in terms of
the US dollar if a total of net benefits of appreciation of the Japanese yen compared with
appreciation of the US dollar and a benefit related with the network externalities of
settlement in terms of the Japanese yen is larger than the switching cost.

All economic agents should always take a same behavior pattern in these two situations.

Figure A-1 shows both of the inequalities (A.5) and (A.6) in a plane of \( n \) and \( c-a \). Inequality (A.5) is represented by a field of A, where all economic agents should switch their settlement currency from the US dollar to the Japanese yen. Inequality (A.6) is represented by a field of B, where all economic agents should keep settling in terms of the US dollar. It is not necessary that all economic agents switch their settlement currency from the US dollar to the Japanese yen or keep settling in terms of the US dollar in a field of C that is located between both fields A and B.

If an economic agent has a larger utility of switching his settlement currency from the US dollar to the Japanese yen than that of keeping using the US dollar as a settlement currency while any other economic agents switch their settlement currency from the US dollar to the Japanese yen \( (v_A \geq u_A) \), he may switch the settlement currency from the US dollar to the Japanese yen. However, he switches it on his expectation that he will be able to enjoy benefits of the network externalities when any other economic agents simultaneously switch their settlement currency from the US dollar to the Japanese yen. Therefore, there is an uncertainty about whether his expectation will be realized.

Suppose that an economic agent has a larger utility of keeping using the US dollar as a settlement currency than that of switching his settlement currency from the US dollar to the
Japanese yen \((v_{NA} \leq u_{NA})\). The economic agent should keep using the US dollar as a settlement currency. Also in this case, the economic agent keep using the US dollar as a settlement currency on his expectation that any other economic agents keep using the US dollar as a settlement currency. Therefore, the economic agent faces in an uncertainty that his expectation will be realized.

If economic agents are risk avert under the uncertainties about any other agents’ behavior, one of them should wait and see others’ behaviors and after then take his own behavior. The others should take the same tactics to wait and see others’ behaviors. Therefore, no economic agents move at first and take their new behaviors. They keep their current behavior. That is, all economic agents tend to refrain from switching the settlement currency from the US dollar to the Japanese yen and keep using the US dollar as a settlement currency in the field of C of figure A-1.

We face in a possibility that all economic agents take no action because they tend to take an action after they wait and see others’ actions. Thus, inertia works when we choose our international currency. We call the situation as a coordination failure because all of the economic agents fail to coordinate to switch their international currency. It is necessary that one economic agent should take an action as a leader or all economic agents should coordinate to take an action in order to fall into the coordination failure. Also, we need to gain momentum to switch the settlement currency from the US dollar to the Japanese yen.
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International Monetary Fund, World Economic Outlook, October 1997.


Ito, T., E. Ogawa, and Y. N. Sasaki, “How did the dollar peg fail in Asia?” Journal of the


Figure 1: Relative Economic Size and Relative Use of Denomination Currencies among United States, Japan, and the European Union

Note 1: Includes intra-EU15 trade.
Note 2: Estimate based on export figures (Hartmann (1999)).
Note 3: Euro 11 + Pound sterling.


Figure 2: Shares in Trade (Exports and Imports)

Data: IMF, Direction of Trade, 1996
Figure 3: Yen-invoiced Transactions in Japan's Exports and Imports

Source: Data provided by Ministry of International Trade and Industry

Figure 4: International Money Market Instruments (shares of amounts outstanding)

US dollar
Euro area currencies
Japanese yen
Other currencies

Source: BIS(2000)
Figure 5: International Bonds and Notes (shares of amounts outstanding)

US dollar
Euro area currencies
Japanese yen
Other currencies

Source: BIS (2000)

Figure 6: Liabilities in Foreign Currencies of International Banks (shares of amounts outstanding)

US dollar
Euro area currencies
Japanese yen
Pound sterling
Swiss franc
Other currencies

Source: BIS (2000)
Table 1: Weights on the US dollar and the yen in exchange rate policies of the Asian countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Coefficient on the US dollar</th>
<th>Coefficient on the yen</th>
<th>Coefficient on the US dollar</th>
<th>Coefficient on the yen</th>
</tr>
</thead>
<tbody>
<tr>
<td>Singapore dollar</td>
<td>0.75</td>
<td>0.13</td>
<td>0.420*</td>
<td>0.021</td>
</tr>
<tr>
<td>Hong Kong dollar</td>
<td>0.92</td>
<td>-0.00</td>
<td>1.002</td>
<td>-0.002</td>
</tr>
<tr>
<td>Korean won</td>
<td>0.96</td>
<td>-0.10</td>
<td>0.941</td>
<td>0.088</td>
</tr>
<tr>
<td>Malaysia ringgit</td>
<td>0.78</td>
<td>0.07</td>
<td>0.589</td>
<td>0.044</td>
</tr>
<tr>
<td>Thai baht</td>
<td>0.91</td>
<td>0.05</td>
<td>0.789</td>
<td>0.104</td>
</tr>
<tr>
<td>Philippine peso</td>
<td>1.07</td>
<td>-0.01</td>
<td>1.087</td>
<td>-0.094</td>
</tr>
<tr>
<td>Indonesian rupiah</td>
<td>0.95</td>
<td>0.16</td>
<td>0.966</td>
<td>0.014</td>
</tr>
</tbody>
</table>

*A coefficient on the SDR is 0.600.
Figure 7: Movements of some East Asian currencies

Figure 7a: Exchange Rates of Thai baht

Data: Datastream

Figure 7b: Exchange Rates of Korean won

Data: Datastream

Figure 7c: Exchange Rates of Singapore dollar

Data: Datastream
Table 2: Estimates of $\gamma$

<table>
<thead>
<tr>
<th></th>
<th>Means</th>
<th>Standard deviation</th>
<th>99% confidence interval</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Based on Eurocurrency interest rates</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 months</td>
<td>0.73</td>
<td>0.13</td>
<td>0.67-0.79</td>
</tr>
<tr>
<td>6 months</td>
<td>0.73</td>
<td>0.13</td>
<td>0.67-0.79</td>
</tr>
<tr>
<td><strong>Based on inflation rate of WPI</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real interest rate=3%</td>
<td>0.72</td>
<td>0.06</td>
<td>0.69-0.75</td>
</tr>
<tr>
<td>Real interest rate=5%</td>
<td>0.73</td>
<td>0.04</td>
<td>0.71-0.75</td>
</tr>
<tr>
<td>Real interest rate=8%</td>
<td>0.73</td>
<td>0.04</td>
<td>0.72-0.75</td>
</tr>
<tr>
<td><strong>Based on inflation rate of CPI</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real interest rate=3%</td>
<td>0.79</td>
<td>0.06</td>
<td>0.76-0.82</td>
</tr>
<tr>
<td>Real interest rate=5%</td>
<td>0.77</td>
<td>0.04</td>
<td>0.75-0.79</td>
</tr>
<tr>
<td>Real interest rate=8%</td>
<td>0.76</td>
<td>0.03</td>
<td>0.74-0.78</td>
</tr>
</tbody>
</table>

Ogawa and Sasaki (1998)
Figure 8a: A relationship between inflation rate (CPI) and share of US dollar

Figure 8b: A relationship between inflation rate (WPI) and share of US dollar

Ogawa and Sasaki (1998)
The growth of yen-based international financial transactions and business will create new business opportunities for Japanese financial institutions and reduce the risks involved in borrowing and lending in foreign currencies. This will also effectively contribute to restoring and improving the competitiveness of Japanese financial institutions. The expansion of yen-invoiced international transactions can reduce foreign exchange risk for Japanese companies.

2. Little Progress in the Internationalization of the Yen

Yen’s share of Japanese export invoices has remained flat at the official Japanese currency is called yen. It was introduced in 1871, two years after the Boshin Revolution. For two years the yen was officially recognised as an international dollar, as all dollars in the world had very similar value up until 1873. The new currency replaced the complex Tokugawa coinage, which consisted of many different coins in various shapes and sizes. It was not very practical, to say the least.