



Local Currency Trade Settlement under the International Monetary System with the US Dollar as a Key Currency¹

1. Introduction

The global financial crisis affected financial institutions in not only the United States but also Europe even though it occurred by nonperforming subprime mortgages and subprime mortgage backed securities in the United States. It damaged balance sheets of European financial institutions. The damaged balance sheets of European financial institutions increased counterparty risks in interbank markets in Europe. They faced US dollar liquidity shortage in Europe. The euro and the sterling pound depreciated so much against the US dollar. Figures 1a and 1b show that the depreciation of the euro and the sterling pound during the global financial crisis was larger than that in the euro zone crisis after 2010.

¹ This paper is prepared for the Conference on “The New Approach to RMB Internationalization in the “New Normality” that is held at Shanghai University of Finance and Economics on 16 October, 2015. It is based on the presentation at the International Forum on Local Currency Swap: New Challenge and Opportunities at Bank of Korea on 24 November, 2014, at the 2014 ASEAN+3 Conference on Beyond Crisis Response Arrangements in Tokyo on 3 December, 2014, and at the International Conference on The Future of the U.S. Dollar, the Internationalization of the RMB, and the Future of the Reform of International Monetary System at Jilin University on 20 March, 2015. I appreciate participants at the conferences for useful comments.

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Its lessons have been discussed in East Asian countries. There seems to be movements to escape from overdependence on the US dollar in order to avoid the US dollar liquidity shortage. They are trying to increase possibility of trade settlement in terms of local currencies in order to escape from the current situation where they overdepend on the US dollar in international trade settlement. On one hand, the monetary authority of China is developing and a currency swap arrangement in terms of the Chinese yuan as well as a cross-border trade settlements in terms of the Chinese yuan with other countries to promote internationalization of the Chinese yuan.

In this paper, we consider European experience during the global financial crisis, specifically depreciation of the euro due to the US dollar liquidity shortage and its mechanism to discuss lessons for East Asia. We consider the current international monetary system with the US dollar as a key currency that is regarded as a background of the US dollar liquidity shortage. Also we focus on inertia of the US dollar as a key currency to introduce empirical analysis related with it. Next, we introduce results of survey on invoice currency choice by Japanese firms that were made in Ito, Koibuchi, Sato, and Shimizu (2013). They pointed out that the Japanese yen are to some extent used as an invoice currency and a trade settlement currency. Lastly, we consider some conditions for the East Asian currencies to be used as a trade settlement currency.

2. Lessons from European Experience during the Global Financial Crisis

(1) From global imbalances to the global financial crisis

Global imbalances widened as worldwide current account imbalances from late 1980s, especially from 2003 to 2007. Among them, a current account deficit of the United States was the largest and increased so much. On one hand, China, Asian emerging market countries, and oil exporting countries increased at higher speed. In the United States, the Federal Reserve Board (FRB) abruptly decreased interest rates to stimulate economic activities after the burst of ICT bubble. The lower interest rates monetary policy was a background to bring about housing boom and, in turn, housing bubble. Subprime mortgage, which was a housing loan for lower income classes based on expectation of increasing housing prices, helped to increase housing investments from 2003 to 2006. It contributed to increase in the current account deficit of the United States.

Consistently insufficient savings of the private sector are pointed out as a basic

background that has kept the current account deficits in the United States. It is savings in Asia and oil exporting countries that have financed the US current account deficits. Savings in Asia flew into US government bonds which are considered as an international safety asset as a foreign reserves. Asia has used its plentiful savings to finance fiscal deficits in the current account deficits of the United States.

On the other hand, European financial institutions play a role as international financial intermediary between oil money from oil exporting countries and the excess housing investments in the United States. Even though Europe, as a whole, had not so large current account imbalances, European financial institutions collected oil money from oil exporting countries and invested in subprime mortgage backed securities issued in the United States.

However, as the housing prices began to drop due to a burst of housing bubble, extremely higher credit risk of subprime mortgages was appearing. As a result, the subprime mortgages became non-performing loans and, in turn, the subprime mortgage backed securities became non-performed. European financial institutions who held the subprime mortgage backed securities damaged their balance sheets like financial institutions in the United States.

(2) US dollar liquidity shortage in the EU

At the same time when European financial institutions were directly affected by the subprime mortgage problem to damage its balance sheets, housing bubbles in some countries of the EU got to burst to make their housing loans nonperforming loans. Moreover, it was not so clear for financial institutions to identify how much of the subprime mortgage backed securities were included mortgage backed securities in general. For the reason, they could not identify how much they damaged their balance sheets among them. They faced a counterparty risk that is uncertainty of how damaged balance sheets of counterpart financial institutions in interbank markets.

European financial institutions faced severer counterparty risks in financing US dollar liquidity at interbank markets in Europe. The phenomenon reflected in jumps of a credit spread between London Interbank Offered Rate (LIBOR) and US Treasury Bill (TB) rate. It means a risk premium of financial institutions operated in London compared with the US TB as a safety asset Figure 2 shows movements in a credit spread between LIBOR and US TB rate with three month maturity in terms of the US dollar. The credit spread was kept

lower level under 0.5% before summer of 2007 when the subprime mortgage problem appeared. It jumped to 2% in summer of 2007 and moreover to 4.5% in September 2008 when the Lehman shock happened. Thus, the jumps of the credit spread of LIBOR in terms of the US dollar mean that European financial institutions have to pay very expensive risk premium in financing the US dollar liquidity in London interbank market. Here, European financial institutions fell into difficulties in financing the US dollar liquidity or liquidity shortage.

(3) Policy reactions against the US dollar liquidity shortage in EU

It became clear that it is not enough that a domestic central bank such as the European Central Bank (ECB) cannot use foreign reserves to supply US dollar liquidity to interbank markets in the EU without any help by the FRB. The FRB concluded a currency swap arrangements with the ECB and the Swiss National Bank to provide for US dollar liquidity on 12 December 2007. After the Lehman shock, it concluded a currency swap arrangement with the Bank of England on 18 September, 2008 and with the Central Bank of Sweden, the National Bank of Denmark, and Bank of Norway on 24 September. On 13 October, the ECB, the SNB, and the BOE introduced an operation to make unlimited supply of US dollar liquidity to commercial banks with collaterals since the FRB made the currency swap arrangements unlimited. On 14 October, the Bank of Japan made the same announcement in order to prepare for a situation where Japanese banks cannot finance US dollar liquidity in interbank markets in Europe.

Thus, it became clear that the US dollar liquidity shortage was beyond control of the ECB and other European central banks without any helps of the FRB. They could only supply their own home currency and decreasing their interest rates. It was difficult for them to supply US dollar liquidity to European financial institutions. Rather the ECB hesitated to decrease interest rates while the euro was depreciating. It could not make such a drastic decrease in interest rates as the FRB did. Moreover, it became clear that the International Monetary Fund (IMF), which gives a financial assistance against any balance of payment crisis does not function as a lender of last resort who supplies unlimited US dollar liquidity. They had to depend on the FRB for a lender of last resort against US dollar liquidity shortage in Europe.

(4) Lessons from European experiences

The European experience of US dollar liquidity shortage tells us that the US dollar is used as a settlement currency in economic transactions within the EU and with non-EU even though the euro is used as a trade settlement currency within regional economic transactions in the EU. The euro is used as a settlement currency especially in international financial transactions. For the reason, the ECB concluded a currency swap arrangement with the FRB in order to finance US dollar liquidity from the FRB. There were no financial institutions at interbank markets in EU before the FRB appeared as a US dollar liquidity supplier. The euro as well as the sterling pound depreciated against the US dollar.

When we consider a lesson from the European experience, we have to take into account over dependence on the US dollar in East Asia. It is true that East Asian economy depends on the US dollar as a settlement currency for not only international trade but also international financial transaction. If East Asian economy faced the same US dollar liquidity shortage as happened in the EU, it would face much severer US dollar shortage in international trade as well as international financial transactions. Therefore, East Asian economy should shift from its over-dependence on the US dollar in all the economic transactions to using also East Asian regional currencies as a trade settlement currency in order to reduce adverse effects of US dollar liquidity shortage to the minimum.

3. Inertia of the US dollar as a key currency under the current international monetary system

(1) Inertia of the US dollar under a Gulliver type of international financial system

We investigate the US dollar as a key currency in the current international monetary system from a viewpoint of functions of international currency in order to consider how to enhance environment that a regional currency may be used as a trade settlement currency. International currency has functions as medium of exchange, store of value, and unit of account like domestic currency (Krugman (1984)). We focus on important functions which include functions as medium of exchange and store of value.

The function as medium of exchange depends on how much general acceptance a currency holds among economic agents in the world. We hold a currency as medium of exchange though we cannot obtain utility by consuming it like goods and services. Which

currency we choose depends on which currency trading partners choose to receive as medium of exchange. Matching of currency as medium of exchange among economic agents is very important in using a currency. It is true that matching for one currency is the easier as larger number of economic agents use the currency. Thus, a network externality works for the function of medium of exchange (Hartmann (1988))². In such monetary exchange economy as the network externality works, once one currency increase a general acceptance, it, in itself, keeps a high level of general acceptance.

This implies that economies of scale work in a function as medium of exchange. In the case where economies of scale work, benefits of holding a key currency with dominantly higher share among international currencies are larger than other currencies with lower share. Moreover, differentials in benefits between the key currency and other currencies are larger as a share of key currency increases. Therefore, as long as the monetary authority who issues a key currency with a dominantly higher share kept monetary growth rate and inflation rate at lower level, the higher share of the key currency would be kept at higher level. Once one currency became a key currency with dominantly higher share, it would be kept a position as a key currency. Thus, historical events that one currency became a key currency would contribute to keeping a position as a key currency. This is why inertia works in a key currency.

It is desirable that a key currency should hold a function as store of value as well as that as medium of exchange. However, the function as store of value might not work sufficiently because the monetary authority issues the currencies to world economy to obtain seigniorage at the maximum. It is true that the US dollar has depreciated to one third of value against the Japanese yen compared with that in 1971 when the Bretton Woods System collapsed.

The current international monetary system is different with the Bretton Woods System where the monetary authority of non-US countries had to fix its home currency to the US dollar as a nominal anchor. No economic agents in the world economy are enforced to use the US dollar as a key currency under the current international monetary system. It is free for them to compare international currencies in terms of both functions as medium of exchange and store of value to choose a key currency in the current international monetary system where we have several international currencies. The US dollar has a relative

² Matsuyama, Kiyotaki, and Matsui (1993) and Trejos and Wright (1996) used a random matching model to conduct theoretical analysis on international currencies.

advantage in a function as medium of exchange rather than a function as store of value. On one hand, the Japanese yen has a relative advantage in a function as store of value. Taking into account the facts, it is regarded that they have placed importance on a function as store of value to choose the US dollar as a key currency. Thus, inertia has been working in the position of the US dollar as a key currency works.

We should take into account current competition situation where several currencies are used as an international currency when we consider internationalization of a local currency. The international currencies are not always effectively competing with each other under the current international monetary system. Both the network externalities and economies of scale give the US dollar a natural monopoly power in competition among international currencies. As transaction volume of one international currency increase, its function as medium of exchange is enhanced. Because transaction volume has a positive correlation with supply of the currency, a function as medium of exchange should be enhanced as a supply of the international currency increases.

A quality of international currency in terms of a function of medium of exchange depends on relative supplies of international currencies in the world economy or its share among international currencies. Because the quality of international currency has a positive correlation with its share among international currencies, international currencies with different shares are heterogeneous in terms of a function as medium of exchange. International currencies with different shares are imperfect substitutes.

An international currency with a relatively higher share has relatively higher quality in terms of a function as medium of exchange. On one hand, an international currency with a relatively lower share has relatively lower quality in terms of a function as medium of exchange. The US dollar with dominantly highest share has completely different quality compared with other international currencies. Thus, it is differentiated so much with other international currencies. We can call such an international monetary system as “Gulliver type of international monetary system” (Ogawa (1998)).

Under the current Gulliver type of international monetary system, the US dollar is regarded to be heterogeneous because it has a dominantly highest share. In the situation, it is difficult for other international currencies to compete effectively with the US dollar. The euro and the Japanese yen could compete effectively with the US dollar if they had the same share with the US dollar. In the current Gulliver type of international monetary system, inertia works in a position of the US dollar as a key currency. For the reason, it is

difficult for the US dollar to decrease spontaneously its share among international currencies. Therefore, we need any momentum for other international currencies to increase their shares in the current international monetary system with the US dollar as a key currency. One of the momentums might be to enlarge intentionally a region where another currency rather than the US dollar is dominantly used in order to enhance a function as medium of exchange. It is pointed out that the introduction of the euro into a large part of EU might have its possibility.

(2) An empirical analysis on inertia of the US dollar as a key currency

We show an empirical analysis and its empirical results regarding an issue whether US dollar's function as medium of exchange relatively lowered after the introduction of the euro. Ogawa and Sasaki (1998) used a money-in-the-utility model to take into account both functions as medium of exchange and as store of value in the international currency competition. They used the model to analyze empirically how strongly inertia of the US dollar as a key currency worked. Ogawa and Kawasaki (2001) applied the methodology to estimate a coefficient on the US dollar in a utility function before and after the introduction of the euro.

We suppose that economic agents enjoy benefits from a function as medium of exchange by holding real balances of international currencies while they face costs of depreciating holding international currencies. We assume a money-in-the-utility model that a private sector has a utility function that real balances of international currencies as well as consumption depend on utility.

It is supposed that a household maximizes the following Cobb-Douglas type of utility function:

$$\int_0^{\infty} U(c_t, m_t^A, m_t^D, m_t^E) e^{-\delta t} dt$$

$$U(c_t, m_t^A, m_t^D, m_t^E) \equiv \frac{c_t^\alpha \left\{ m_t^{A\beta} (m_t^{D\gamma} m_t^{E1-\gamma})^{1-\beta} \right\}^{1-\alpha}}{1-R}$$

$$0 < \alpha < 1, 0 < \beta < 1, 0 < \gamma < 1, 0 < R < 1$$

(1)

where U : utility, c : real consumption, m^A : real balance of home currency, m^D : real balance of US dollar, m^E : real balance of other international currencies.

A coefficient γ on real balance of US dollar m^D in the utility function imply how much real balance of US dollar contributes to utility relatively compared with real balances of other international currencies. The higher coefficient implies that real balance of US dollar has a relative higher function as medium of exchange compared with real balances of other international currencies.

Household maximizes utility function (1) under an intertemporal budget constraint assuming the following contemporaneous budget constraint at time t :

$$w_t^P = \bar{r}w_t^P + y_t - c_t - tax_t - i_t^A m_t^A - i_t^D m_t^D - i_t^E m_t^E \quad (2)$$

The following equation (3) means components of real wealth:

$$w_t^P \equiv b_t^A + b_t^D + b_t^E + m_t^A + m_t^D + m_t^E \quad (3)$$

where w^P : real wealth of private economic agent, \bar{r} : real interest rate, y : real income, tax : tax payments, i^A : nominal interest rate in terms of home currency, i^D : nominal interest rate in the US dollar, i^E : nominal interest rate in terms of other currencies, b^A : real balance of home currency denominated bond, b^D : real balance of US dollar denominated bond, b^E : real balance of other international currency denominated bond. Assuming that both a purchasing power parity and an interest rate parity, real interest rate \bar{r} is equal among countries in the world economy.

The budget constraint (2) means that economic agents consume disposal income subtracted from real balances of home currency m^A , US dollar m^D , and other international currencies m^E and costs of holding them $(i^A - \bar{r})m^A$, $(i^D - \bar{r})m^D$, and $(i^E - \bar{r})m^E$. Given a Fisher effect that nominal interest rate minus real interest rate is equal to expected rate of inflation, we can obtain $(i^A - \bar{r})m^A = \pi^A m^A$, $(i^D - \bar{r})m^D = \pi^D m^D$, and $(i^E - \bar{r})m^E = \pi^E m^E$. It implies that inflation reduces real

balance of international currencies. This is costs of holding international currencies.

We can obtain optimal real balances of international currencies from a first order condition for maximization of utility under the intertemporal budget constraint. Specifically, an optimal share of holding real balance of US dollar ϕ is derived:

$$\phi_t = \frac{m_t^D}{m_t^D + m_t^E} = \frac{1}{1 + \frac{1 - \gamma}{\gamma} \frac{i_t^D}{i_t^E}} = \frac{1}{1 + \frac{1 - \gamma}{\gamma} \frac{\pi_t^D + \bar{r}}{\pi_t^E + \bar{r}}}$$

(4)

Equation (4) shows that an optimal share of holding real balance of US dollar depends on not only relative weight of real balance of holding US dollar in the utility function but also nominal interest rate or expected rate of inflation or depreciation of US dollar and other international currencies. An optimal share of holding real balance of US dollar depends on costs and benefits of holding real balance of US dollar

Ogawa and Kawasaki (2001) based on the theoretical model to conduct an empirical analysis of point estimation. The empirical results are shown Table 1. Table 1 focuses on a weight on the real balance of US dollar in the utility function γ before and after the introduction of the euro. During a whole sample period from the first quarter of 1986 to the first quarter of 2000, a 99% of confidence interval for a weight of real balance of US dollar γ is 0.57 to 0.67 in the case of using data of nominal interest rates. A 99% of confidence interval for a weight of real balance of US dollar γ is 0.66 to 0.71 in the case of using data of expected rate of inflation and supposed real interest rates.

They divided the sample period into two subsample periods in order to analyze how the weight on real balance of US dollar γ changed before and after the introduction of the euro. A subsample period of pre-introduction of the euro covers from the first quarter of 1986 to the fourth quarter of 1998. A subsample period of post-introduction of the euro covers from the first quarter of 1999 to the fourth quarter of 2000. For the subsample period of pre-introduction of the euro, a 99% of confidence interval for a weight of real balance of US dollar γ is 0.56 to 0.66 in the case of using data of nominal interest rates. A 99% of confidence interval for a weight of real balance of US dollar γ is 0.66 to 0.71 in the case of using data of expected rate of inflation and supposed real interest rates. On one hand, for the subsample period of pre-introduction of the euro, a 99% of confidence interval for a

weight of real balance of US dollar γ is 0.74 to 0.78 in the case of using data of nominal interest rates. A 99% of confidence interval for a weight of real balance of US dollar γ is 0.61 to 0.69 in the case of using data of expected rate of inflation and supposed real interest rates.

We cannot find statistically significant changes in a weight of real balance of US dollar γ when we compare that before and after the introduction of the euro. It implies that the introduction of the euro could not change the international monetary system with the US dollar as a key currency. Thus, inertia of the US dollar as a key currency, in fact, worked very well.

Thus, inertia of the US dollar as a key currency works in the world economy. We can call it as a global key currency. It is difficult to shift a global key currency from the US dollar to other international currencies. It might take a long time if it succeeded. On one hand, taking into account the fact that the euro is a key currency only in the euro zone and the EU, it is possible for other currencies to become a key currency in a limited region. We call it as a regional key currency in contrast with a global key currency. The euro is regarded as a regional key currency in Europe. The above mentioned lesson of European experience in the global financial crisis tells us that it might be to bring about much severer liquidity crisis in East Asia because East Asian economy extremely depends on the US dollar as a trade settlement currency in the region. It is necessary for a local currency in East Asia to become a regional key currency rather than to depend extremely on the US dollar.

4. Conditions for local trade settlement currency

(1) Survey analysis of Japanese export firms

The Japanese yen is regarded as a major international currency among East Asian currencies. We introduce a survey analysis of Ito, Koibuchi, Sato, and Shimizu (2013) to investigate how much the Japanese yen is used as a trade settlement currency. They used a questionnaire survey on the choice of invoicing currency with all Japanese manufacturing firms listed in the Tokyo Stock Exchange. Questionnaires were sent out to 920 Japanese firms in September 2009, and 227 firms responded.

The survey analysis focused on questions regarding the choice of invoicing currency.

In addition, they conducted a preliminary question about whether an invoice currency (a currency to be used at the stage of contracts) is the same as a settlement currency (a currency to be used at the stage of payments). It is found that 200 firms out of 226 respondents, which is equivalent to 88.4 percent of our sample firms, answered that the same currency was used for both invoicing and settlements. Thus, the settlement currency is the same as the invoice currency in almost of cases. It is regarded that the Japanese firms tend to use the same currency for both trade settlement and invoice.

Table 2 shows the invoicing share of Japanese exports to the world based on the results of the questionnaire survey. When we look at the arithmetic average share of all manufacturing industries, where 217 firms responded, the share of yen-invoicing is larger (48.2 percent) than that of US dollar invoicing (42.2 percent). The share of euro invoicing accounts for only 7.1 percent, and other currencies are seldom used for currency invoicing (2.7 percent). On one hand, when we look at the weighted average share, which is calculated by using the amount of foreign sales of respective sample firms, the share of US dollar invoicing becomes the highest, amounting to 54.1 percent. The share of yen invoicing declines to only 28.7 percent that is far lower than the corresponding arithmetic average share. The difference suggests that foreign currency invoicing tends to be chosen by export firms with larger size in terms of foreign sales, which will be demonstrated below by presenting far more detailed data on the invoicing share.

Table 3a shows the invoicing choice in Japanese exports to advanced countries and emerging economies excluding Asian countries, where the simple arithmetic average is reported. The US dollar is mainly used in Japanese exports to North America. Obviously, the share of US dollar invoicing is the highest (77.9 percent) in exports to the United States. In exports to Euro area, the share of euro invoicing is 51.0 percent, while 35.3 percent of exports are invoiced in the Japanese yen. In exports to the UK, the share of the sterling pound invoicing is 32.1 percent, somewhat lower than that of yen invoicing (35.0 percent).

Table 3b shows the invoicing pattern in exports to Asian countries. While it is generally pointed out that US dollar is dominantly used in Asian trade, yen-invoicing generally accounts for the highest share. When we look at all manufacturing firms, the share of yen-invoicing is more than 50 percent for all destinations except for Hong Kong. The choice of invoicing currency depends on the size of firms. There is a clear tendency that the larger (smaller) the size of firms, the higher the share of US dollar (yen) invoicing is. In the case of larger firms, the share of yen-invoicing is somewhat higher than that of US

dollar invoicing. For smaller size firms, 70 to 91 percent of exports are invoiced in the Japanese yen except for exports to China and Hong Kong.

The analytical results of Ito, Koibuchi, Sato, and Shimizu (2013) made it clear that the Japanese firms use the Japanese yen second to an importing country currency as invoice and trade settlement currencies in exporting products to the United States and Europe. On one hand, Japanese firms tend to use the Japanese yen as invoice and trade settlement currencies in exporting products to Asian countries. Moreover, there is a clear relationship between the size of firms and the choice of invoicing currency in Japanese exports to Asian countries. The smaller the firm size, the higher the share of Japanese yen invoicing is. Based on the fact, it is not necessarily unrealistic to escape from overdependence on the US dollar in choosing a trade settlement currency in Asia and to shift into using any regional currencies in Asia as a trade settlement currency.

(2) Conditions for a trade settlement currency

Whether East Asian currencies are chosen to be used as a trade settlement currency by private firms like the Japanese yen depends on its usability as a trade settlement currency. For the moment, few East Asian currencies are regarded to have its usability as a trade settlement currency like the Japanese yen. Usability of a currency as a trade settlement currency is easiness to obtain the relevant currency in foreign exchange transactions and to exchange it to another currency. For the purpose, it is necessary that daily transaction volume of foreign exchange of the relevant currency should be enough plentiful and that its foreign exchange markets should have enough depth in terms of liquidity. Regulation against foreign exchange transactions by the monetary authority or foreign exchange controls are pointed out as one of impediments.

Next, export firms as well as import firms need hedging against foreign exchange risk due to using a foreign currency as a trade settlement currency. For the purpose, they should conduct natural hedging through adjusting balance sheets by borrowing or lending foreign currencies. They should use foreign exchange derivatives which include forwards, futures, options, interest rate swaps if they have currency exposures after they conduct natural hedging. Because they might be used for speculation, the monetary authority often avoids speculative attacks by speculators to impose capital control as well as foreign exchange controls. That is why local currencies of countries where foreign exchange and capital controls are imposed have poor usability. Its foreign exchange markets are extremely thin

in terms of liquidity.

It is necessary for the monetary authority to deregulate foreign exchange and capital controls in order that East Asian currencies should use as a trade settlement currency. The deregulation measures are an institutional issue regarding internationalization of a local currency. In other words, it is a supply side issue for internationalizing a local currency since the monetary authority supplies the currency. At the same time, it is necessary to deepen foreign exchange markets in terms of liquidity. It might contribute to increase usability of the currency for private firms. These are a demand side issue since it means that it should enhance needs of the relevant currency for private firms. As mentioned, the demand side issue might be not easily controllable for the monetary authority because inertia works very well for due to network externalities.³

5. Conclusion

The US dollar liquidity shortage in European interbank markets during the global financial crisis suggest that the US dollar are still used as a settlement currency in economic transactions with external economy even though the euro is used a trade settlement currency within the euro zone and the EU. When we look at the current situation in East Asia, private firms overdepend on the US dollar as a trade settlement currency even for economic transactions within East Asia. The global financial crisis gave no direct adverse effects on Asian financial institutions through the subprime mortgage backed securities. However, it is sure that Asian financial institutions should have faced much severer US dollar liquidity shortage or US dollar liquidity crisis if they had the same direct effect as the European financial institutions.

Given that globalization of economy and finance have already proceeded in the world economy, it is difficult for East Asian countries to escape from the international monetary system with the US dollar as a global key currency. On one hand, the euro is used as a regional key currency in European region. It is definitely not impossible to foster East Asian currencies as a regional key currency in East Asian region. The lesson of European experiences during the global financial crisis tells us that it is necessary for East Asian countries to use their own currencies as a trade settlement currency in East Asian region

³ Council on Foreign Exchange and Other Transactions (1998) reported internationalization of the Japanese yen. Demand side problems regarding internationalization of the Japanese yen have still been left while Institutional and supply side problems have been solved.

rather than to depend on the US dollar so much.

For the purpose, the monetary authority should deregulate foreign exchange and capital controls from viewpoints of institution and supply side of international currency. Convertibility of currency should be secured in terms of not only current account but also capital account. Convertibility of currency in terms of capital account should enhance foreign exchange risk management. Moreover, from a viewpoint of demand side, it might be difficult to create an international currency that surpasses the US dollar because inertia works very well for the US dollar as a key currency. However, it might be possible to foster a regional key currency in the East Asian region. It is sure that it is highly necessary.

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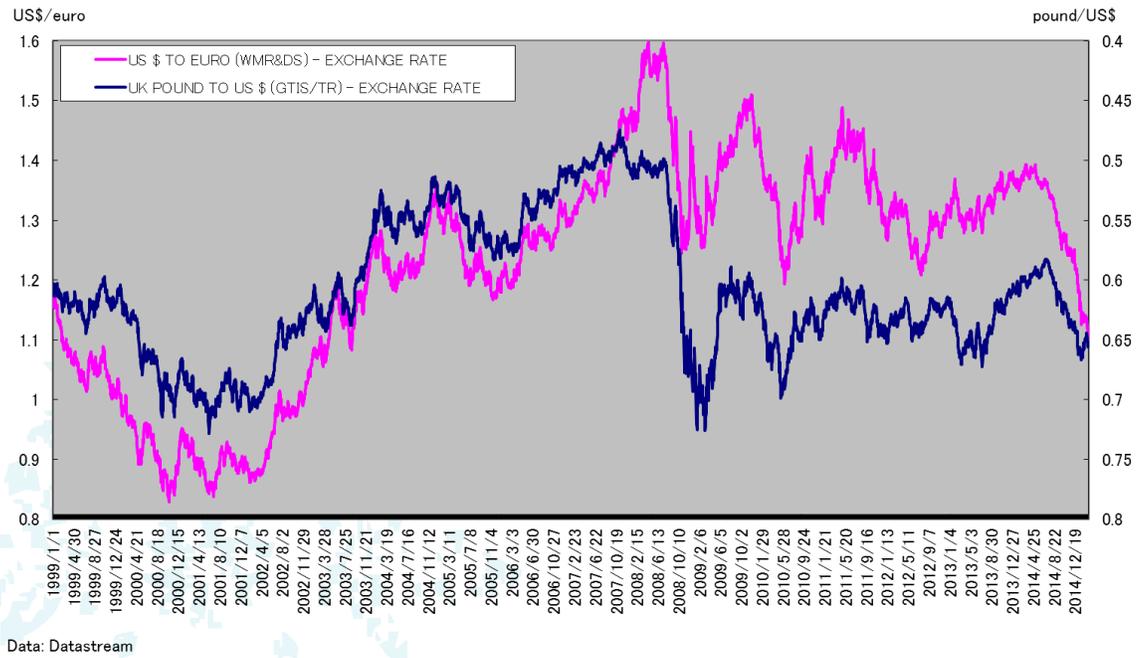
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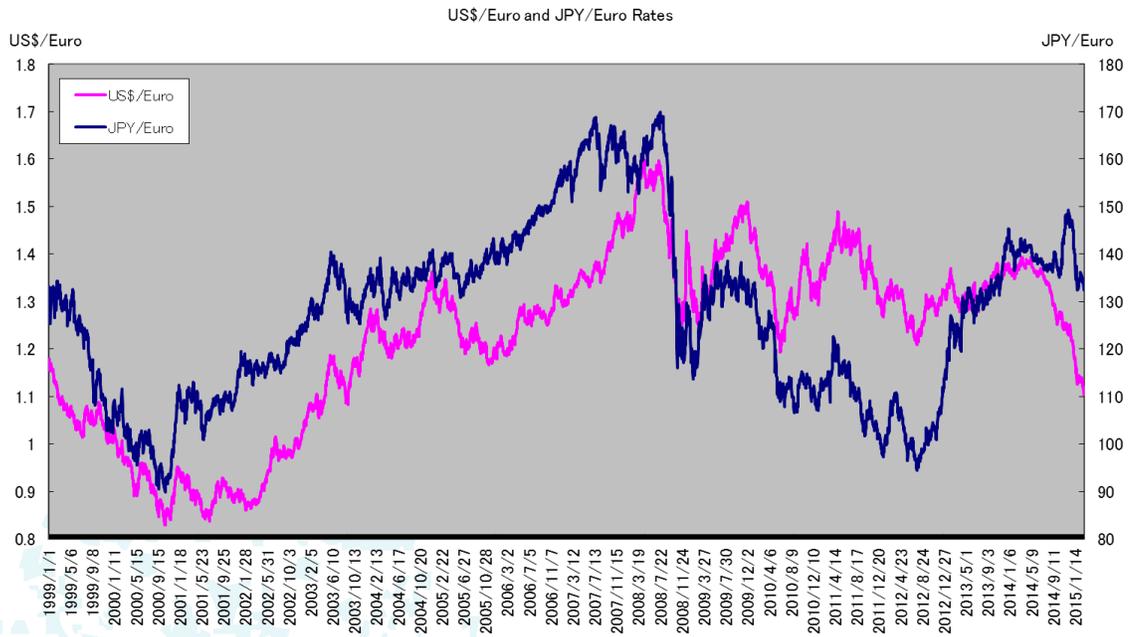
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Figure 1a: exchange rates of the euro and the sterling pound in terms of the US dollar



Data: Datastream

Data: Datastream



Data: Datastream

Figure 1b: exchange rates of the euro in terms of the US dollar and the Japanese yen

Data: Datastream

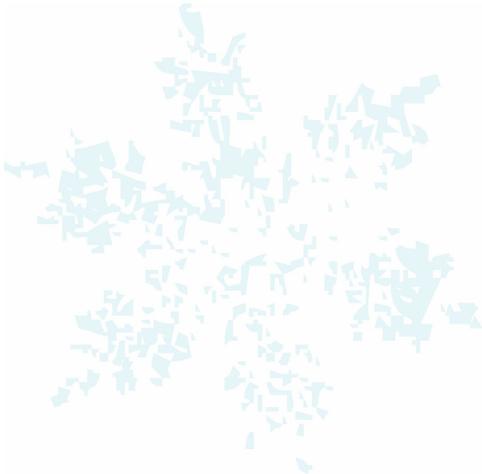
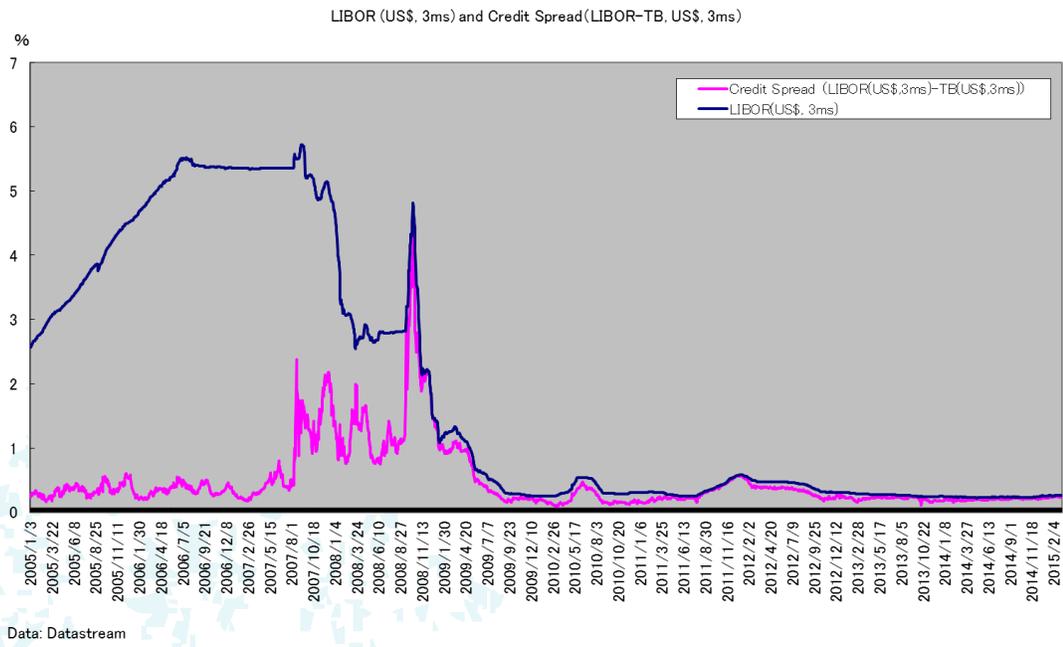


Figure 2: LIBOR (US dollar, 3mos) and its credit spread (LIBOR – TB rate)



Data: Datastream

Table 1: estimation results of weight on the US dollar in utility function

	Mean	Standard deviation	99% confidence interval
Based on Inflation rate of CPI			
<u>1986Q1-2000Q1</u>			
Real interest rate = 3%	0.61	0.06	0.59-0.63
Real interest rate = 5%	0.62	0.06	0.60-0.64
Real interest rate = 8%	0.63	0.06	0.60-0.64
<u>1986Q1-1998Q4</u>			
Real interest rate = 3%	0.62	0.06	0.59-0.64
Real interest rate = 5%	0.62	0.06	0.60-0.64
Real interest rate = 8%	0.62	0.06	0.60-0.64
<u>1999Q1-2000Q1</u>			
Real interest rate = 3%	0.58	0.03	0.55-0.61
Real interest rate = 5%	0.58	0.02	0.56-0.60
Real interest rate = 8%	0.58	0.01	0.57-0.60
Based on Eurocurrency interest rate			
<u>1986Q1-2000Q1</u>			
3 months	0.63	0.13	0.59-0.68
6 months	0.63	0.13	0.59-0.68
<u>1986Q1-1998Q4</u>			

3 months	0.62	0.13	0.57-0.67
6 months	0.62	0.13	0.58-0.67

1999Q1-2000Q1

3 months	0.76	0.02	0.73-0.78
6 months	0.76	0.02	0.74-0.78

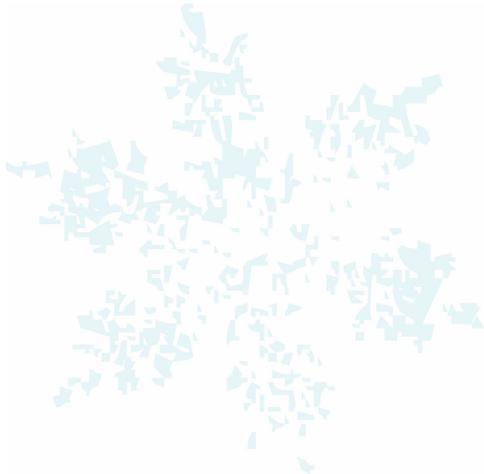


Table 2: Share of Currency Invoicing in Japanese Exports to the World (Percent)

Currency:	Number of sample firms ³⁾	All Firms		Total Consolidated Sales			Foreign Sales*		
		Arithmetic average ¹⁾	Weighted average ²⁾	Large ¹⁾ (upper 1/3)	Medium ¹⁾ (middle 1/3)	Small ¹⁾ (lower 1/3)	Large ¹⁾ (upper 1/3)	Medium ¹⁾ (middle 1/3)	Small ¹⁾ (lower 1/3)
		217	217	80	70	67	64	70	83
Japanese Yen		48.2	28.7	38.1	50.0	58.3	41.2	52.2	50.2
US Dollar		42.1	54.1	47.8	41.7	35.8	45.5	39.0	42.1
Euro		7.1	11.3	10.5	5.1	5.2	11.0	5.7	5.3
Other Currencies		2.7	5.9	3.7	3.3	0.7	2.5	3.0	2.5

Source: Ito, Koibuchi, Sato, and Shimizu (2013)



Table 3a: Share of Invoice Currency in Japanese Exports by Destination (Percent)

	Destination											
	USA	Canada	Mexico	Brazil	Central & Latin America	Euro Area	UK	Russia	Eastern Europe	Austra- lia	New Zealand	Africa
Number of answers	168	50	36	51	39	133	65	34	40	70	37	35
Japanese Yen												
All Manufacturing	21.8	29.2	34.0	50.3	50.3	35.3	35.0	63.0	58.9	52.5	56.5	63.3
Large	16.0	13.7	23.0	37.6	41.7	29.7	30.5	58.8	52.0	42.6	54.3	61.5
Medium	23.9	45.0	45.7	60.0	55.6	30.1	17.7	37.5	46.8	50.3	33.2	62.5
Small	26.5	61.4	57.1	80.0	71.6	49.2	65.0	90.0	88.9	84.6	80.0	75.0
US Dollar												
All Manufacturing	77.9	48.2	66.0	45.6	45.1	13.6	18.5	29.7	13.1	29.1	32.6	34.7
Large	83.5	59.6	77.0	61.7	54.7	11.4	12.7	30.1	12.5	30.6	32.4	35.4
Medium	76.1	30.0	54.3	30.0	44.4	16.4	30.0	50.0	15.9	41.4	66.8	37.5
Small	72.9	29.5	42.9	11.0	14.4	13.9	21.4	11.1	11.1	7.7	7.5	25.0
Euro												
All Manufacturing	0.3	1.7	0.0	4.1	4.6	51.0	15.7	8.4	28.0	1.3	0.0	2.0
Large	0.7	2.7	0.0	0.6	3.6	58.8	23.6	11.1	35.5	2.4	0.0	3.1
Medium	0.0	0.0	0.0	10.0	0.0	53.2	10.7	12.5	37.3	0.0	0.0	0.0
Small	0.0	0.0	0.0	9.0	14.0	36.9	0.7	0.0	0.0	0.0	0.0	0.0
Importer's Currency												
All Manufacturing	---	20.0	0.0	0.0	0.0	---	32.1	0.0	0.0	18.5	2.7	0.0
Large	---	22.6	0.0	0.0	0.0	---	35.7	0.0	0.1	25.9	0.0	0.0
Medium	---	25.0	0.0	0.0	0.0	---	41.7	0.0	0.0	11.1	0.0	0.0
Small	---	9.1	0.0	0.0	0.0	---	12.9	0.0	0.0	7.7	12.5	0.0
Other Currencies												
All Manufacturing	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	8.2	0.0
Large	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	13.3	0.0
Medium	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Small	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Ito, Koibuchi, Sato, and Shimizu (2013)

Table 3b: Share of Invoice Currency in Japanese Exports by Destination (Percent)

	Destination											
	China	Korea	Taiwan	Hong Kong	Singapore	Thailand	Malaysia	Indonesia	Philippines	Vietnam	India	Middle-East
Number of answers	174	142	150	106	103	122	94	84	71	61	72	63
Japanese Yen												
All Manufacturing	55.4	69.0	62.5	45.6	56.9	60.1	56.1	61.6	63.0	64.9	76.3	51.9
Large	45.3	62.5	53.3	33.3	52.0	54.7	51.1	53.3	52.6	67.9	68.6	41.5
Medium	60.5	68.9	63.0	44.5	54.0	57.3	45.7	66.7	64.7	41.9	81.3	50.3
Small	63.4	78.9	75.2	68.3	70.5	75.5	84.1	74.9	82.4	80.9	91.0	73.4
US Dollar												
All Manufacturing	43.7	25.5	35.3	49.4	37.8	30.4	42.4	33.8	35.8	35.1	21.2	42.7
Large	52.4	32.8	42.6	61.9	42.6	35.4	48.4	41.0	43.9	32.1	29.4	49.4
Medium	40.9	25.8	35.7	46.7	43.1	32.5	50.7	27.5	35.3	58.1	18.7	49.1
Small	34.2	13.8	24.0	30.7	21.2	16.7	15.4	25.1	18.8	19.1	1.9	23.4
Euro												
All Manufacturing	0.5	1.1	0.3	0.0	0.5	0.2	0.3	0.6	0.0	0.0	1.1	4.2
Large	0.4	0.5	0.0	0.0	1.0	0.4	0.5	1.2	0.0	0.0	2.1	6.7
Medium	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6
Small	1.2	1.9	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1
Importer's Currency												
All Manufacturing	1.3	4.5	2.4	4.8	4.8	9.4	1.1	4.0	1.4	0.0	1.4	2.4
Large	3.2	4.2	4.1	4.7	4.2	9.5	0.0	4.5	2.9	0.0	0.0	4.9
Medium	0.0	4.2	2.1	8.9	2.9	10.1	3.6	5.8	0.0	0.0	0.0	0.0
Small	0.0	5.4	0.4	0.0	8.4	7.8	0.0	0.1	0.0	0.0	7.1	0.0
Other Currencies												
All Manufacturing	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.0	0.0	0.3
Large	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.7	0.0	0.0	0.6
Medium	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Small	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Source: Ito, Koibuchi, Sato, and Shimizu (2013)

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