Local currency trade settlement under the international monetary system with the US dollar as a key currency

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The global financial crisis depreciated European currencies

- The global financial crisis, which started from US financial institutions as an epicenter, seemed to erode confidence of US financial sector and the US$ and, in turn, to give depreciating impacts to the US$ against other currencies.

- However, it is not the US$ but European currencies (the euro and the sterling pound) that depreciated during the global financial crisis.

- The euro depreciated against also the JPY during the global financial crisis.
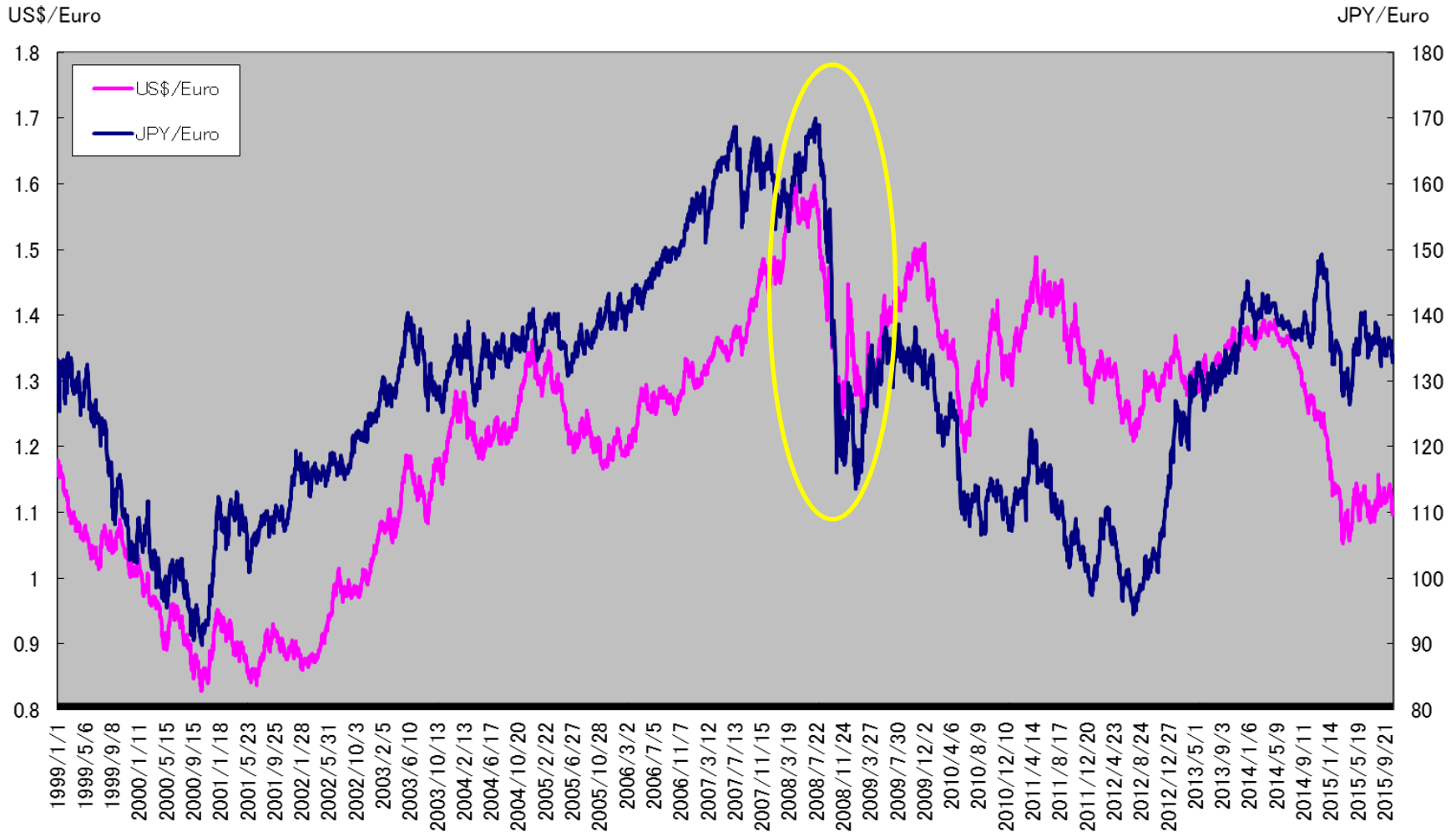
Fig.1: exchange rates of euro and pound against US$

US$/euro

pound/US$

Legend:
- US $ TO EURO (WMR&DS) – EXCHANGE RATE
- UK POUND TO US $ (GTIS/TR) – EXCHANGE RATE
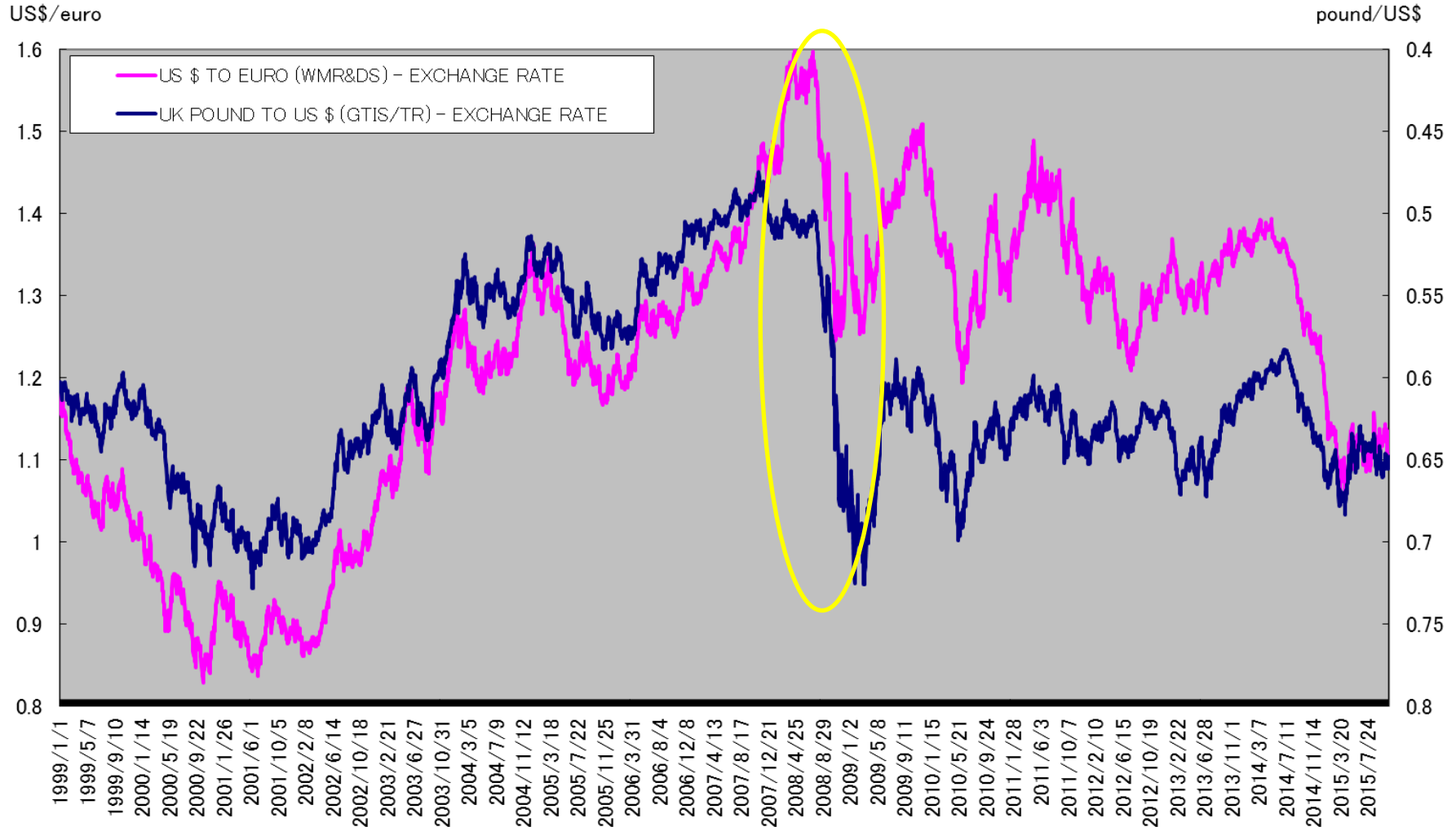
Data: Datastream

Fig.2: exchange rates of euro against US$ and JPY


US$/Euro and JPY/Euro Rates

Data: Datastream

US$ liquidity shortage during the global financial crisis (1)

- European financial institutions played as a role of international financial intermediary in the situation of global imbalance (current account deficit in the US and current account surplus in oil exporting countries) before the global financial crisis. Specifically, they financed oil money and invested in mortgage backed securities (MBS) which were issued in the US.

US$ liquidity shortage during the global financial crisis (2)

- Bubble bursts of housing prices brought about subprime mortgage problem, which damaged their balance sheet of European financial institutions as well as US financial institutions which held the related MBS.

- They faced difficulties in financing US$ liquidity in inter-bank markets in Europe due to counter-party risk under uncertainty regarding how much non-performing MBS were held by their counter-parties in inter-bank financial transactions in terms of the US$. It led excess demand for the US$ in foreign exchange markets.

Fig.3:credit spread
(LIBOR(US$)-US TB, 3 mos)

LIBOR (US$, 3ms) and Credit Spread(LIBOR−TB, US$, 3ms)
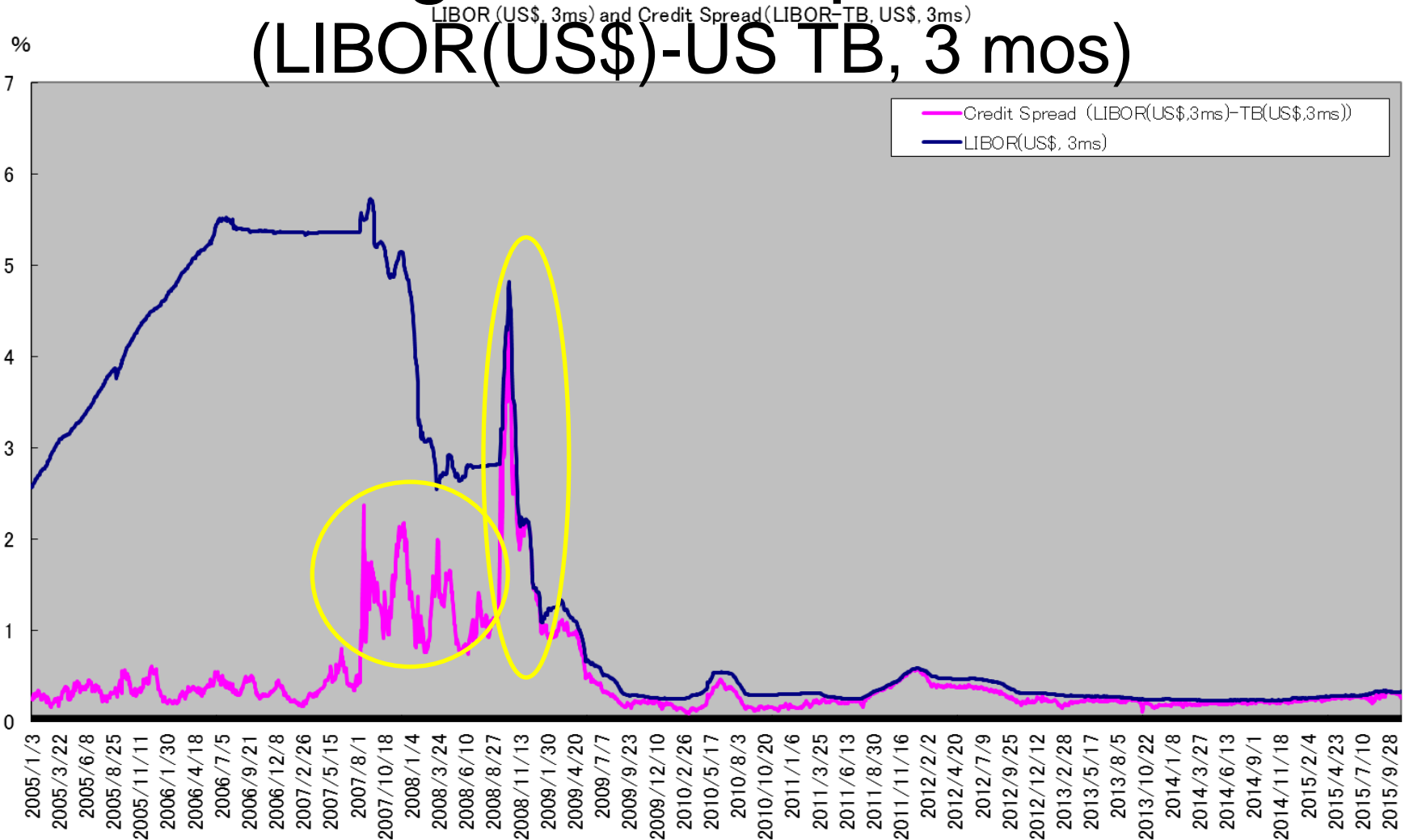
Data: Datastream

FRB's measures against the US$ liquidity shortage

- The FRB not only started quantitative easing monetary policy with zero FF rate but also provided unlimited supply of US$ liquidity to other major central banks through currency swap arrangements in order to solve the US$ liquidity shortage. The central banks have made unlimited supply of liquidity to European financial institutions based on the US$ liquidity provided by the FRB.

- The counter-party risk in inter-bank markets has reduced since November 2008.

- It clarifies that economic agents in the EU needs the US$ as a settlement currency for external economic transactions even though they can use the euro for intra-regional economic transactions in the euro zone or in the EU.

Currency swap arrangements of FRB

- 12/22/2007: FRB concluded a currency swap arrangement (CSA) with ECB and Swiss National Bank (SNB). ECB and SNB introduced operation of supplying US$ based on the CSA.
- 3/11/2008: FRB increased CSA with ECB and SNB.
- 5/2/2008: FRB increased CSA with ECB and SNB. They increased operation of supplying US$ based on the CSA.
- 7/30/2008: FRB increased CSA with ECB. It increased operation of supplying US$ based on the CSA.
- 9/18/2008: FRB increased CSA with ECB and SNB. Fed concluded a CSA with BOE. BOE introduced operation of supplying US$ based on the CSA.
- 9/24/2008: FRB concluded a CSA with Central Banks of Sweden, Denmark, and Norway.
- 9/26/2008: FRB increased CSA with ECB and SNB. ECB, SNB, and BOE increased operation of supplying the US$ based on the CSA.
- 9/29/2008: FRB increased CSA with the Central Banks and extend it from the end of January 2009 to the end of April 2009.
- 10/13/2008: ECB, SNB, and BOE introduced operation of unlimited supply US$ liquidity within collateral. Fed removed limits of supplying the US$ liquidity to them.

Lessons from the European experience

- Economic agents in the EU needs the US$ as a settlement currency for external economic transactions even though they can use the euro for intra-regional economic transactions in the euro zone or in the EU. For the reason, they faced the US$ liquidity shortage and in turn depreciation of the European currencies during the global financial crisis.

- If Asian financial institutions suffered from the similar damages in their balance sheets that were caused by the subprime mortgage problem, much severer US$ liquidity shortage would happen in Asia where the US$ is, in general, dominantly used for a large part of trade settlements.

US$ as only one key currency under the Bretton Woods System

- The US$ was only one nominal anchor under the Bretton Woods System from 1944 to 1971. It was a rule of game under the Bretton Woods System that the monetary authority of the US had to fix the US$ to the gold while monetary authorities of the other countries had to fix their home currencies to the US$. In 1971, the US President Richard Nixon stopped convertibility of the US$ into gold. The Bretton Woods System finished at the Nixon shock.

- The US$ was used as a trade settlement currency as well as a intervention currency under the dollar peg system.

A key currency in the current system

- In the current international monetary system, the US$ is still working as a key currency which means a major settlement currency in international trade, capital, and financial transactions while a part of countries accumulate the US$ foreign reserves to intervene in the foreign exchange markets.

- Thus, a function of medium as exchange such as a settlement currency is more important than that of store of value in choosing a key currency.

Gulliver type of currency competition

- A key currency has a function as medium of exchange that is closely related with general acceptance of currency. Network externalities, which means that externalities should be enhanced depending on number of others who give externality effects to an individual, work in the general acceptance. Thus, economies of scale works in using currencies because of the network externalities.

- It is general that markets with economies of scale have little effective competition. It is possible to apply it to a currency competition in selecting a key currency. The current international monetary system with the US$ as a key currency is regarded as a "Gulliver" type of competition which means that only one giant firm compete with other small firms.

Inertia of the US$ as a key currency

- The US$ keeps a position of key currency in such a Gulliver type of currency competition because economies of scale works to give it an advantage of keeping a position of key currency.

- It is called as "inertia" of key currency. In physics, "inertia" define that the resistance of any physical object to any change in its state of motion, including changes to its speed and direction. Like this phenomenon, the US$ as a key currency that have already built up a dominant share in international trade and finance settlements under the Bretton Woods System.

Empirical analysis on inertia of a key currency
(Ogawa and Sasaki (1998), Ogawa and Kawasaki (2001))

- Analyze inertia of the key currency (US$) after the introduction of the euro to investigate whether the euro might have economies of scale compared with the US$.

- Theoretical framework: money-in-the-utility (MIU) model with benefit (contribution of real balance of currency to utility) and cost (depreciating value of currency) of holding currencies.

- Point estimation of parameters on the US$ and the euro in the MIU model.

- Data on real balances of currencies: Currency Cross-boarder Liabilities in Foreign Currencies ,*BIS*.

- Compare estimated weights for sub-sample periods (a pre-euro period [1986Q1-1998Q4] and a post-euro period [1999Q1-2000Q1]).

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MIU model for international currencies

- Money-in-the-utility (Cobb-Douglas type):

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

benefit of holding currencies

weight on US$

$$U\left(c_t, m_t^D, m_t^E, m_t^Y\right) \equiv \frac{\left[c_t^\alpha \left\{m_t^{D\beta}\left(m_t^{E\gamma} m_t^{Y1-\gamma}\right)^{1-\beta}\right\}^{1-\alpha}\right]^{1-R}}{1-R}$$

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

- Inter-temporal budget constraint (contemporaneous budget constraint):

cost of holding currencies

$$\dot{w}_t^P = \bar{r}w_t^P + y_t - c_t - tax_t - i_t^A m_t^D - i_t^D m_t^E - i_t^Y m_t^Y$$

$$w_t^P \equiv b_t^D + b_t^E + b_t^Y + m_t^D + m_t^E + m_t^Y$$

Share of the US\$ and weight on US\$ in the utility function

- Share of the US\$

$$\phi_t = \frac{m_t^D}{m_t^D + m_t^E + m_t^Y} = \frac{1}{1 + \dfrac{1-\beta}{\beta}\dfrac{i_t^D}{i_t^{E+Y}}} = \frac{1}{1 + \dfrac{1-\beta}{\beta}\dfrac{\pi_t^D + \overline{r}}{\pi_t^{E+Y} + \overline{r}}}$$

- Weight on the US\$ in the utility function

$$\beta = \frac{1}{1 + \left(\dfrac{1}{\phi_t} - 1\right)\dfrac{i_t^{E+Y}}{i_t^D}} \qquad \beta = \frac{1}{1 + \left(\dfrac{1}{\phi_t} - 1\right)\dfrac{\pi_t^{E+Y} + \overline{r}}{\pi_t^D + \overline{r}}}$$

Table 1: estimated weights on the US$ (1)

	Mean	Standard deviation	99% confidence interval
Based on Inflation rate of CPI			
1986Q1-2000Q1			
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
1986Q1-1998Q4			
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
1999Q1-2000Q1			
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

Table 1: estimated weights on the US$ (2)

	Mean	Standard deviation	99% confidence interval
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
<u>1999Q1-2000Q1</u>			
3 months	0.76	0.02	0.73-0.78
6 months	0.76	0.02	0.74-0.78

Analytical results on inertia of the US$ as a key currency

- Weights on the US$ in the utility function were around 60% before and after the introduction of the euro in 1999.

- Weights on the US$ in the utility function did not significantly decrease after the introduction of the euro.

- It implies that it is was possible to keep unchanged benefits of holding the US$ even after the introduction of the euro. We found inertia of the US$ as a key currency.

Global vs. regional key currency

- The inertia of the US$ as a key currency in the global economy ("global key currency") implies that it takes long time to shift the global key currency from the US$ to another currency.

- On one hand, it is possible to make a regional major currency a key currency in the region ("regional key currency"). The euro is regarded as a regional key currency in European region.

=>It is necessary to have a regional key currency instead of the US$ as an international trade settlement currency in Asia from the European experience during the global financial crisis.

Questionnaire survey on Japanese firms' choice of invoicing currency

- Ito, Koibuchi, Sato, and Shimizu (2013) conducted 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.

Summary of the questionnaire survey

- The Japanese firms use the JPY second to an importing country currency as invoice and trade settlement currencies in exporting products to the United States and Europe.

- They tend to use the JPY 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 JPY invoicing is.

- Based on the fact, it is not necessarily unrealistic to escape from overdependence on the US$ in choosing a trade settlement currency in Asia and to shift into using any regional currencies in Asia as a trade settlement currency.

Conditions for a trade settlement currency (1)

- Whether East Asian currencies are chosen to be used as a trade settlement currency by private firms like the JPY depends on its usability as a trade settlement currency.

- 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.

Conditions for a trade settlement currency (2)

- Export and 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 authorities impose capital and foreign exchange controls. Its foreign exchange markets are extremely thin in terms of liquidity.

Conditions for a trade settlement currency (3)

- 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 is a supply side issue for internationalizing a local currency since the monetary authority supplies the currency.

- 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.

Conclusion (1)

- The European experience of the US$ liquidity shortage during the global financial crisis tells us that economic agents in the EU needs the US$ as a settlement currency for external economic transactions even though they can use the euro for intra-regional economic transactions in the euro zone or in the EU. If Asian financial institutions suffered from the similar damages in their balance sheets that were caused by the subprime mortgage problem, much severer US$ liquidity shortage would happen in Asia where the US$ is, in general, dominantly used for a large part of trade settlements.

Conclusion (2)

- It is difficult for Asian economy to escape from the US$ as a key currency monetary system in the global economy.

- However, it is possible to make a regional major currency a key currency in the region ("regional key currency"). The euro is regarded as a regional key currency in European region.

- It is necessary to have a regional key currency instead of the US$ as an international trade settlement currency in Asia from the European experience during the global financial crisis.

Conclusion (3)

- 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$ because inertia works very well for the US$ as a key currency.

- However, it might be possible to foster a regional key currency in the East Asian region.