Measuring the Costs of an Asian Currency Unit

Fumihide Takeuchi  
Senior Economist

At the meeting of finance ministers of Japan, China, South Korea and ASEAN countries in India late May, it was agreed that they will conduct a study on a “regional currency unit.” The initiative has been driven by their ever-growing mutual dependence through trade and investment and the consequent increase in importance of foreign exchange rate stability in the region. The first step towards such integration would actually involve efforts by each country in stabilizing its currency against a basket of yen, US dollar and euro. This would, in turn, collectively result in stable foreign exchange rates among their currencies.

In Europe, a regional currency unit, ECU, was introduced before the single currency, euro. There are even wider economic disparities among Asian countries and a single currency is not an immediate option. It is, therefore, important to understand what influences coordination of foreign exchange policies vis-à-vis a currency basket, or a move towards a single-currency regime, Asian currency, would likely have on the regional economy.

Merits and Costs of a Single Currency

According to the theory of an Optimal Currency Area, or OCA, one of the greatest benefits of introducing a single currency like the euro is the elimination of foreign exchange risks in intra-regional trade. When the merits and costs of a single currency are plotted against ratios of trade to GDP of trading partners, the merits would be depicted as an upward-sloping curve.

Then, what about the downward sloping cost curve? Economic fluctuations or shocks that are unique to a certain economy are less likely to occur as its goods and services increasingly penetrate the markets of its partners through trade and vice versa, and those economies generally show a higher tendency to move together.

For any country, the principal benefit of maintaining own foreign exchange rate mechanism is its ability to adjust the exchange rates in response to unique shocks and keep the economy from fluctuating too widely. The introduction of a regional single currency would mean the loss of the means to stabilize the economy. It, however, would cost the economy less if trade promotion could reduce the occurrence of isolated shocks in the first place. These considerations should help interpret the negative relationship between the costs of a single currency and levels of trade.
The costs of a single currency may also be influenced by other factors including difference in industrial structure and the flexibility of labor and capital markets. That is to say, the more similar (different) the industrial structure of a specific country is to that of the overall region, the less (more) prone unique shocks are to happen, and higher (lower) flexibility of factor markets enables a country to better (less) absorb the shocks, which will lead to a decrease (an increase) in the costs. These influences will be represented by downward (upward) shifts in the negatively sloped cost curve.

**Considerations to Industrial Structure and Trading Relationships**

Based on the theoretical framework as mentioned above, the costs of a single currency to different Asian countries are quantitatively assessed. As seen earlier, the costs of a single currency are inextricably linked with actual fluctuations in foreign exchange rates. If changes in foreign exchange rates play an important role as an economic stabilizer, the costs of an Asian currency would be high by abandoning the adjustment tool. More specifically, the following equation explaining foreign exchange rate fluctuations is used for estimation:

\[
SD(e_{ij}) = \alpha + \beta_1 SD(\Delta y_i - \Delta y_j) + \beta_2 \text{dissim}_{ij} + \beta_3 \text{trade}_{ij} + \beta_4 \text{size}_{ij}
\]

where the independent variable, SD(e_{ij}), is the standard deviation of the rate of change in nominal exchange rates between countries i and j, and explanatory variables, i) SD(\Delta y_i - \Delta y_j), ii) dissim_{ij}, iii) trade_{ij} and iv) size_{ij}, measure the standard deviation of the rate of change in the ratio of GDP of the two countries, degree of gaps in their industrial structure (represented by the sum of absolute differences in industrial composition of GDP), average ratio of bilateral trade between the two countries to GDP over the estimation period, and average size of the combined GDP over the estimation period (in log value), respectively.

Variables i) and ii) represent unique shocks to a given economy, while variable iii) is an index of the penetration of foreign goods and services. Their coefficients are expected to be positive for variables i) and ii) and negative for variable iii). Variable iv) is a proxy for the benefits of a single currency. A smaller economy is more dependent on foreign demand and is poised to benefit more from a single currency regime. That is the reason the positive sign is expected for its coefficient.

The actual estimation is conducted using calendar year data in the period of 1987-2003 for twelve countries with available information, out of the sixteen countries with which Japan has recently proposed a comprehensive economic partnership - ten ASEAN members, China, South Korea, India, Australia, New Zealand and the United States. Each variable is either an average or standard deviation over the estimation period and the combination of the twelve countries yield sixty-six samples.
The estimation results are shown below the chart. They are statistically significant with signs of the coefficients all as expected. The chart illustrates projected cost indices of a single currency by country as of 2002, derived by substituting the data from the year into the estimated equation. Separate cost indices are calculated depending on whether US dollar or Japanese yen is assumed to be the single Asian currency, with due considerations to the possibility of a basket of Japanese, US and European currencies becoming the base unit of a Asian currency. Three-year standard deviation figures in the period of 2001-2003 are calculated and used as 2002 values of standard deviation i).

Cost index in case Japanese yen is adopted as the single currency

\[
SD(eij) = -0.349 + 1.972SD(\Delta y_i - \Delta y_j) + 0.002\text{dissimij} \\
-0.001\text{dissimij} \times \text{dum} - 0.781\text{tradeij} + 0.012\text{sizeij}
\]

Figures in parentheses are t-statistics.
The dummy on dissim takes the value of one in case of Australia and New Zealand and zero, otherwise.

The greater the cost index is, the more challenging the adoption of a single currency will be for a country. Estimation errors warrant attention when comparing the indices among different countries, as index levels may vary. One should note, however, indices for Indonesia are markedly high due to wide differences in its industrial structure. In those cases where cost indices show a great variance depending on whether Japanese yen or US dollar is adopted as the single currency, the results reflect not only the influences of trading relationships and synchronism of business cycles but also the fact that the US has a low
manufacturing weight in its economy compared with Japan and, in that sense, its industrial structure is rather similar to that of other Asian countries. China’s indices may look surprisingly low, which is due to high manufacturing-to-GDP ratios of the country.

The argument of this article has been focused on the costs of a single currency in relation to foreign exchange rate fluctuations. Such issues, which may be of special interest to China, as the determination of conversion ratios at which existing currencies are to be exchanged into a single currency await further discussion.

References