



Don't be misguided by the real effective exchange rate of the Yen : Clues for interpreting the severity of the higher yen

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<Abstract>

- (1) The yen-dollar exchange rate is approaching the historic peak level recorded in 1995. In contrast, the real effective exchange rate (real EER) of the yen as broadly defined by the BIS still remains significantly low compared to the historic peak.
- (2) This phenomenon largely reflects the fact that real EERs are calculated using the consumer price index (CPI). Although actual data are not available, there is a high possibility that the real EER would be much higher if rates are adjusted by the price index for tradable goods. This possibility can be presumed from the price patterns of Japan and its trading partners. The Japanese economy has experienced a long period of deflation with almost no changes in the CPI and with export prices virtually following the CPI trend. Japan's trading partners, particularly in Asia, have had higher rates of increase in their CPIs, although they have had lower rates of increase in their tradable goods prices than in their CPIs. It can be

said, therefore, that Japanese exporting companies are facing much stiffer price competition than what the real yen EER suggests.

- (3) During the period 1980 -1994, the rise in export prices was largely surpassed by the rise in consumer prices in Japan. This was a result of higher productivity growth among exporting goods industries compared to consumer goods industries. During 1995-2010, however, there were no big differences in productivity gains and price increases between the two industries. This suggests that productivity improvement among Japanese export industries is slowing down, coinciding with a reported decline in their competitiveness. The real EER is an effective tool to measure international competitiveness, but it should be carefully interpreted in the case of Japan, taking into account the above considerations.

<Full Text>

The most important issue for the Japanese economy is currently the rapid appreciation of the yen. Measured by the real effective exchange rate (real EER), the appreciation of the yen appears to have been much more modest. Nevertheless, the company survey of the Ministry of Economy, Trade and Industry (METI) reveals the uphill battles Japanese exporting companies face vis-a-vis their overseas competitors, while calls are increasing within the industry for accelerating the shift to overseas production. How should we understand the effects of the different movements of the exchange rates? The real EER is an important indicator to measure the price competitiveness of a country. When we take into account the fact that the Japanese economy has been in a deflationary phase and is facing catch-up challenges from emerging countries, it appears that Japanese exporting companies are facing much greater pressures from price competition than what the real EER would imply. The authors aim to show the case for this possibility in the following sections.

Price competitiveness can be measured not by the nominal yen-dollar exchange rate but by the real effective exchange rate.

The nominal exchange rate of the yen against the dollar recently shot up to 83 yen

per dollar and has since been hovering near around that level. This is the level that has been surpassed only by the record high of 79.75 yen which was registered on April 19, 1995.

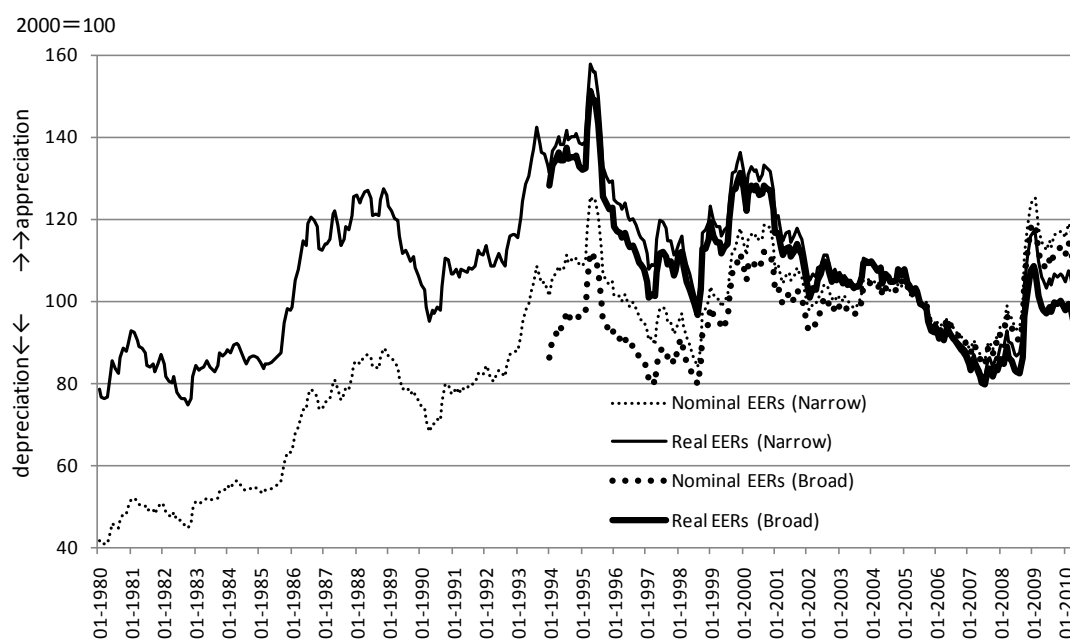
Of course it will be problematic to compare the yen exchange rates only in terms of the US dollar. Japan trades not only with the US but also with other countries. Wages and prices in each country have significantly changed in these 15 years. Therefore, in order to use the exchange rate to measure price competitiveness, we need to have an indicator that is adjusted for these changes.

Effective exchange rates (EERs) are adjusted for such changes. In contrast, nominal EERs are calculated as geometric weighted averages of bilateral exchange rates of a currency against those of a country's major trading partners. A rising index normally signifies appreciation of the yen and a falling index depreciation. However, nominal EERs are not adjusted for price movements. The more prices in Japan increase, the more price competitiveness of Japanese goods are reduced. Therefore, even if the nominal exchange rate does not change, it will have the same impact as an appreciation of the yen. On the contrary, if the prices in Japan's trading partners rise, it will have the same effect as a depreciation of the yen. From this consideration, the real EERs would be calculated by adjusting the nominal EER for the bilateral price inflation differentials between Japan and its trading partners.

Why has the real EER of the yen traced a depreciation trend?

The Bank for International Settlements (BIS) publishes broad and narrow EER indices (2005=100) for a number of countries of the world both in nominal and real terms. These indices show appreciation (depreciation) of a currency as the indices go up (go down). Narrow EERs are calculated based on only trades with advanced economies and broad EERs include trades with emerging and other developing countries as well (Chart 1). Let us see the movements of the yen in the latter series.

Chart1. Effective Exchange Rates of the Yen : Nominal and Real, Broad and Narrow



Note: Nominal EERs (effective exchange rates) are calculated geometric weighted averages of bilateral exchange rates. Real EERs are the same weighted averages of bilateral exchange rates adjusted by relative consumer prices. Narrow indices comprise advanced countries and broad indices comprise emerging and developing economies in addition to advanced economies.

Weight patterns is time-varying, and weights for broad indices for 2005-07 are:20.5% for the US, 15.2% for euro area, 23.8% for other Advanced countries (of which 14.8% for Asian NIEs), 31.7% for Emerging Asia and the rest for others.

Source: BIS

After recording 151.11 in April 1995, the broad real EER indices of the yen continued to decline for the most part to reach 79.69 in July 2007, and rose to 103.04 as of July 2010. Compared with the level of April 1995, the indices in July 2010 represented a depreciation of 30%. This largely differs from the trend of a nominal yen-dollar rate which could well go up to the record high at any moment.

Why has the real EER tended to depreciate during the past 15 years? In the meantime, nominal EERs rose by about 6% in July 2010 (at 118.77) as compared with April 1995 (at 112.12). This means appreciation, not depreciation.

Weights assigned to currencies in the broad EER are 20.5% for the US dollar, 15.2% for the euro, 23.8% for currencies of other advanced economies (of which Korea, Taiwan, Hong Kong and Singapore account for a total of 14.8%), 31.7% for those of emerging Asian countries such as China, and the rest for other developing countries. The yen has risen a bit higher vis-a-vis the comprehensive indices compared to its rise

vis-a-vis the US dollar, although the difference is not big enough to be a major issue.

The factors affecting the nominal EER are not the same factors behind the depreciation trend of the real EER. The real cause lies in the adjustment process for the price movements in calculating the real EER.

The level (not the rate of change) of the Japanese consumer price index was virtually stable for the period between 1995 QII (at 100.9) and 2010 QII (at 99.7). That means zero increase in 15 years. On the other hand, the decline of the real EER suggests that prices within Japan's trading partners have risen by about 30% on a trade-weighted basis during the same period.

The real EERs still indicate an unfavorable competitive environment for Japanese exporting companies

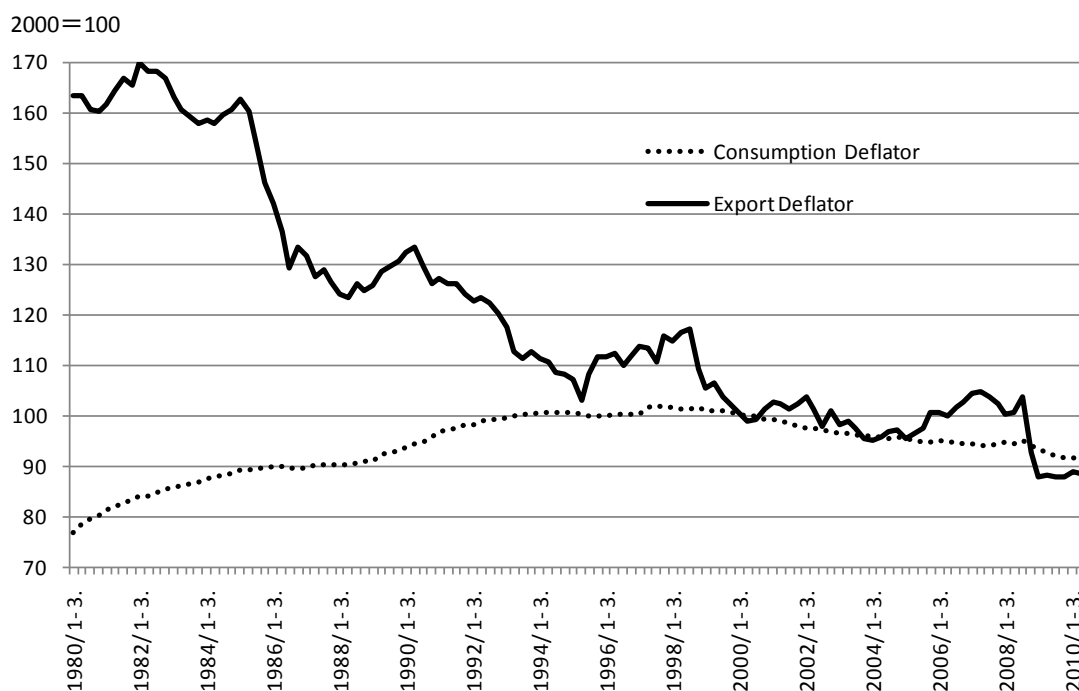
Does the depreciating real EER provide Japanese exporting companies a level playing field vis-à-vis their foreign competitors? Absolutely Not!

If we use the real EERs as a tool to measure international competitiveness, it would be desirable to use tradable goods prices in adjusting for price movements. The BIS in principle uses the CPI for deriving the real EERs. However, the CPI includes such non-tradable goods as payments for barber services which are not freely traded across borders.

It will be difficult to replace the CPI with an index reflecting mainly such tradable goods prices as export prices since such data are not always available, especially in emerging and developing countries. If we could calculate the real EERs using such tradable goods prices as export prices, we would most possibly obtain a higher real EER for the yen.

This is supported by evidence from the movements of the GDP deflator which give us a more comprehensive picture of price movements. The GDP deflator is subdivided into sub-indicators, corresponding to each component of the GDP. Important among them are the movements of the private consumption deflator and export deflator (Chart 2). It should be pointed out that the private consumption deflator and the GDP deflator tend to move in tandem.

Chart 2. Japan's Export Deflator and Consumption Deflator



Note: Export deflator is deflator for exports of goods and services.

Source: Japan's Cabinet Office data

In the case of Japan, the consumption deflator increased by 30.5% from 1980 QI to 1995 QII, while the export deflator declined by 37.0% (both are expressed in simple rates of change, not in annualized terms). In the same period, the real EER increased by 102.8%. Taking into account the differentials between consumption deflator and export deflator, an increase (i.e., degree of appreciation) of the real EER based on tradable goods prices would be less than half the increase of the CPI based on the real EER. (Narrow real EER indices are used since the broad ones are not available for 1993 and preceding years.)

During this period, Japan's export industries performed very well despite the rapid appreciation of the yen. The preceding explanation points to one of the factors behind this development. This good performance was achieved not by a stroke of good fortune but through improvements in productivity, which was reflected in the decline of the export deflator. Given the fact that prices are nearly equal to the wages divided by productivity and that wage increases did not vary widely among sectors, a much lower increase of the export deflator as compared to that of the consumption and GDP

deflators indicates the success of Japanese exporting companies in improving their productivity.

Next, let us consider the changes from 1995 QII to 2010 QII. We see a big change in the movements of these deflators. While the export deflator has continued to decline, the pace of decline has slowed to 14.1%. On the other hand, the consumption deflator, which had increased during the previous period, reversed its trend, dropping by 8.9%¹ in this period, which has been characterized as the era of the “deflationary economy.” The rates of decrease between the export deflator and the consumption deflator do not differ widely (Table 1).

Table 1. Changes in the EERs of the Yen and Japan’s Deflators

| | Level (2000=100) | | | Changes (%) | |
|------------------------------|------------------|----------|----------|-----------------------------|------------------------------|
| | 1980 QI | 1995 QII | 2010 QII | from 1980 QI to 1995 QII | from 1995 QII to 2010 QII |
| Real EERs (Broad) | - | 149.52 | 98.17 | - | -34.3 |
| Nominal EERs (Broad) | - | 111.32 | 112.83 | - | 1.4 |
| Real EERs (Narrow) | 77.17 | 156.47 | 106.67 | 102.8 | -31.8 |
| Nominal EERs (Narrow) | 41.04 | 124.88 | 119.03 | 204.3 | -4.7 |
| Private Consumption Deflator | 76.8 | 100.2 | 91.3 | 30.5 | -8.9 |
| Export Deflator | 163.5 | 103.0 | 88.5 | -37.0 | -14.1 |

Note: Rates of changes are simple changes over the term and not annualized.

Refer to the Note for Chart 1 for EERs.

Source: BIS; Japan’s Cabinet Office

What does this imply? It implies that the real EER calculated using the CPI will not differ much from the one calculated using tradable goods prices. However, one thing should be noted. Asian NIEs and emerging Asia account for 14.8% and 31.7% among the weights in the real EER. In these economies that are in the process of catching up with the advanced economies, export prices often tend to rise more slowly than consumer prices. This is because export industries often achieve higher increases of productivity than other sectors, given that the former faces tough international competition. This would indicate that the real EER would be higher if calculated based on tradable goods prices rather than the CPI.

In other words, although BIS calculations of real EER indices based on the CPI would indicate a tendency toward yen depreciation, the real EER based on tradable

¹ In the same period, the CPI stayed almost stable, but as an important point in this discussion is the comparison between consumption deflator and export deflator, this will not affect the conclusion.

goods prices would indicate a weaker depreciation of the yen or even an appreciation. If this assumption is correct, the trend of the real EER would be consistent with the growing difficulties that Japanese exporting companies face in competing abroad and the increasingly louder calls in the industry for companies to relocate production facilities overseas.

These arguments are purely presumptive, as available data are limited. However, if we try to more correctly measure the real EER based on tradable goods prices making full use of input and output data of tradable industries, they should give us a more accurate and clearer picture of the competitive environment that Japanese companies face. What we can say with certainty is that it would be problematic to use the real EER based on the CPI as an indicator of international price competitiveness. The development of real EERs based on tradable goods prices or other approximate indicators, challenging though it may be, would be desirable.

Finally, it needs to be pointed out that chart 2 suggests that productivity improvement in Japan's export industries has been slowing down. This is of major importance for the future of the Japanese economy.

During the period 1995-2010, there has been little difference between changes in the consumption deflator and export deflator. As mentioned earlier, this means that productivity gains in Japan's export industries have barely kept pace with those in the consumer goods industries. Analogical reasoning tells us that, in the period of 1980-94, export industries achieved incomparably higher productivity gains compared to the consumer goods industries. In addition, the decline in the export deflator seems to have come to a halt.

These facts signify that productivity improvement in Japan's export industry has been slowing down. This is also reflected in signs of decline in Japan's export competitiveness, as often reported in the media.

Generally speaking, the real EER is a representative indicator to measure international competitiveness. In the case of the Japanese economy, however, it should be used and interpreted with the above considerations in mind.

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