

**Two Decades after the Plaza:  
A Package of Mixed Blessings\***

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**The TRIO Conference, Tokyo, September 2007**

**\*We are indebted to Yosuke Takeda of Sophia University for his valuable comments.**

## **Two Decades after the Plaza: A Package of Mixed Blessings**

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### **Abstract**

The Plaza Accord in 1985 and a series of subsequent attempts by major industrial countries to coordinate exchange rates made a dramatic epoch in the history of interventions in the exchange rate markets under the flexible exchange rate. Plaza Accord was planned betraying prevailing expectations and could manage the major exchange rates effectively by verbal promises combined with coordinated monetary policies. The good news was that at least at the beginning it succeeded in turning around the directions of exchange rates and apparently in moderating the current account imbalances of major participants like Japan and United States. The bad news was that it could not stop the real exchange rates from tumbling too much into an extreme direction.

We first demonstrate theoretically that under the floating regime the benefit from exchange rate coordination is very limited, and that the joint attempts of coordination in fact imposed the advanced economies an unnecessary, additional constraint to keep the balances of the current account.

Then we trace the effects of exchange rate coordination on the macroeconomic performance of the Japanese economy. The reaction to the contraction due to the higher yen after the Plaza was a combination of expansionary monetary and fiscal policies, and this reaction continued too long. When the Bank of Japan took the corrective measure to curb the asset bubbles, it adopted a precipitous contraction of money supply, which was most probably one of the main reasons of triggering massive asset deflation. Jorgenson and Nomura (2007) gave a vivid account of the burdens that major industries had to carry after the Plaza Accord. This paper gives a macroeconomic overview of the process of how the Japanese economy was exposed to the fluctuation of the yen real exchange rate and how it finally recovered from its heavy burden of overvaluation of the exchange rate.

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# **1. Introduction**

**In 1985, Noboru Takeshita, then finance Minister and later Prime Minister of Japan, went to play golf near the Narita Airport. After playing nine holes, he rushed to the Airport and flew to the Plaza Hotel by Pan American airline in order not to be detected by Japanese passengers (Gyohten in Volker and Gyohten, p.252). This was a start of the drama of exchange rate intervention or coordination rarely observed by history.**

**In retrospect, it succeeded in changing the course of exchange rate, and partly in changing the course of current account of Japan, US and other countries in the Group of Five or Seven. The terms of trade facing Japan was also improved since the reference currency for the oil and commodity prices was the dollar. On the other hand, this coordination attempt often left substantial burdens on the macroeconomic performance of participating nations, and particularly of Japan because the yen real exchange rates of expressed in terms of alternative price indexes started an upward journey that ended only after more than twenty years.**

**Recently, the Bank of Japan (BOJ) notices that the real effective exchange rate of Japan approximately returned to the level of the pre-Plaza Accord. The macroeconomic adjustment of the Japanese economy after the Plaza finally enabled itself to secure the same level of competitive edge for industries in terms of the real exchange rate. It would be a good time to reconsider the policy implications of such an attempt and to assess the historical course of events after the Plaza Accord and subsequent coordination attempts of exchange rates.**

**There is a valuable documentation of the process of the Plaza Accord (Funabashi, 1988) and an excellent economic analysis (Ito, 1987, 1992). By utilizing his analysis of news and market responses around the globe, Ito examined the five waves of the Yen appreciation during two years after the Plaza Accord. We agree his general assessment that mere interventions in the market or verbal comments of policy makers could not create sustainable exchange rate movements. This paper extends our perspective into two decades after the Plaza, and investigates the consequences of the monetary policy stance, particularly of the BOJ and the Ministry of Finance (MOF), that kept the real exchange rate of the yen substantially higher than its value at the dawn of the policy coordination**

attempt. This paper also intends to supplement Ito by examining the rationales of exchange rate coordination under the floating regime and by reflecting on the course of events that might have led Japan to the “lost decade” in the 1990s.

Recently Jorgenson and Nomura (2007) shed a new light on the meaning of the real exchange rate in their elaborate analysis of industrial technological progress. They calculated the yen/dollar real exchange rate in terms of sector price levels across the Pacific. The increase of the real dollar/yen rate (the appreciation of the yen) implies a higher hurdle for the Japanese industry to compete in the United States. At the peak of the unusual yen appreciation in 1995, they conclude that the yen-dollar real exchange rate calculated by the GDP deflators of Japan and the United States exceeded about 78 percent above the level of pre-Accord situation. One observes the gain in the terms of trade on the part of Japan to the world, but this extremely high real exchange rate imposed on the Japanese economy high burdens for international competition. This paper explores the macroeconomic aspects of this issue, and asks why the Japanese economy was brought into a trap of the high real yen exchange rate.

In Section 2 of this paper, we theoretically show that the merit of policy coordination under floating regime is rather limited if not at all useless. The floating regime in principle allows effective and decentralized choices of the price levels and the levels of macroeconomic activities without coordination, because policy makers are able to choose the levels of macroeconomic activities rather independently without any constraint on the balance of payments. The coordination attempts after the Plaza imposed on participating countries the current account levels as additional targets that reduced the degree of freedom of monetary policies.

In section 3 of the paper, we show the idea that the current account of countries will or must converge to zero is misleading. We draw an attention to the result (Hamada, 2007) that shows the open loop Nash equilibrium of two person differential game of the Ramsey-Cass-Koopmans capital accumulation displays a stationary state that the stationary level of international indebtedness can deviate substantially from zero as long as the rates of time preference are not identical between nations. In such a situation, imposing a current account target on countries could do more harm than good in most situations. In other words, the current account of an nation need not to be zero and the real equilibrium exchange rate (REER) that balances the current account needs not to be a policy

target.

In Section 4, we explain the conceptual difference between the real exchange rate and the terms of trade. The real exchange rate in terms of a sector price shows the ratio of its price at home relative to its price abroad. Abstracting from the transportation cost and so forth, it shows the competitiveness of a sector in trade, as an exporter or as an import competitor. The increase in the yen real exchange rate means that the hurdle to export or to compete as import industry increased for a Japanese producer and that the domestic industry has to strive through technical progress or cost reductions. On the other hand, the terms of trade is the relative price of exports and imports. The improvement in the terms of trade would mean that the full employment income of Japan increased.

In Section 5, we will illustrate the implication of the above theoretical analysis by tracing the historical course of events after the Plaza Accord. If the Japanese economy was sailing before the favorable wind of the improvement in the terms of trade, it could counter the difficulty from the tide of the increasing real exchange rate. If the latter halted, it went into a difficulty period of recession, unemployment and deflation. In this way, theoretical considerations provide some clues to interpret the history, but many puzzles do remain about the details.

## **2. Independence of Monetary Policy under Float**

We will illustrate by a simple example of monetary interactions under floating regime that the monetary independence prevails if participating countries in the regime are interested in only their price levels and, in case of the existence of trade offs, the corresponding employment levels.

Let us consider for simplicity a world that consists of two countries of the same size both under the fixed exchange rate and under the flexible exchange rate in turn. Let us denote the economic variables of the home country without asterisks and those of the foreign country with asterisks \*.

### **2-1. The fixed exchange rate.**

First, start from the case of the fixed exchange rate. Define the excess monetary

creation of the two countries as

$$x = \frac{\dot{D}}{M} - kg_Y,$$

$$x^* = \frac{\dot{D}^*}{M^*} - kg_Y^*$$

Here M, Y and D designate money, real GDP and the credit expansion in terms of buying operation of domestic bonds.  $g$  signifies the rate of growth in such a

way that that  $g_M = \dot{M}/M$  and  $g_Y = \dot{Y}/Y$ . The Marshallian  $k$  can be different,

but here we assume for simplicity that they are identical between the countries.

Under the fixed exchange rate regime, the common rate of price change  $\pi$  is

given by  $\pi = \frac{x + x^*}{2}$ . The normalized balance of payments,  $z = S/M$ ,

$z^* = S^*/M^*$ , where S, and S\* are the surplus of the balance of payments in the two countries, is given (e.g. Johnson, 1972, Hamada, 1976) by

$$z = \frac{x^* - x}{2},$$

$$z^* = \frac{x - x^*}{2}.$$

If the countries have the policy objectives to minimize the price deviation and the deviation from the balance of payments constraints, that is,

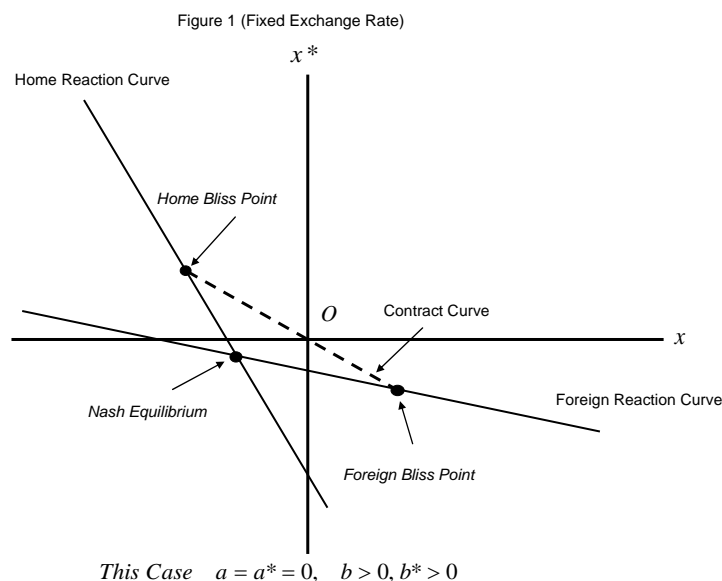
$$(\pi - a)^2 + \theta(z - b)^2 \quad \text{and} \quad (\pi - a^*)^2 + \theta(z^* - b^*)^2$$

or

$$\left[\frac{x + x^*}{2} - a\right]^2 + \theta\left[\frac{x^* - x}{2} - b\right]^2 \quad \text{and} \quad \left[\frac{x + x^*}{2} - a^*\right]^2 + \theta\left[\frac{x - x^*}{2} - b^*\right]^2.$$

Here  $a$  and  $a^*$  are the most desirable rate of price increase for the home and foreign countries, and  $b$  and  $b^*$  are the most desirable balance of payments in the home and foreign country respectively. Then as shown in Hamada (1976), the Nash equilibrium, that is, the intersection of reaction curves lies outside the contract curve, the Pareto efficient configuration for two countries unless  $b + b^* = 0$ . Thus the independent policy interactions will result in the combination unsatisfactory to both countries. Figure 1 indicates that the intersection of reaction curves diverts from the Pareto efficient configuration except the two bliss points coincide. This is a typical case of strategic substitutes in a game of policy interplay. If the demand for foreign reserves sums up to positive, the Nash equilibrium locates itself to the deflationary side of the contract curve as Figure 1.

Thus one can state: Under the fixed exchange rate, except for the case  $b^* = -b^*$ , the non-cooperative outcome is not Pareto efficient, and the room exists to improve the situation by international monetary policy coordination.



## 2-2. The Flexible Exchange Rate without the Balance of Payments Constraint.

If the world were to consist of two economies where goods prices adjust instantaneously, then the price level in each country moves exactly the same as its excess money creation under the floating regime (we distinguish here the inflation rate at home without asterisk from that in the foreign country with asterisk). Then  $M$  can be identified as  $D$  and  $M^*$  as  $D^*$ . It follows

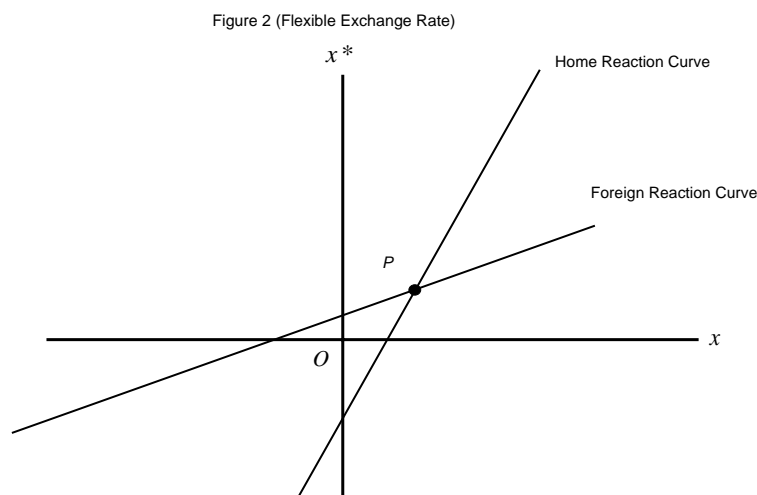
$$\pi = x, \text{ and } \pi^* = x^*.$$

If price rigidities exist as we actually observe in the world economy, the short run monetary interdependence under float is in the negative direction (Canzoneri Matthew B. and Joanna Gray, 1985) indicating the beggar-thy-neighbor effect of the monetary policy. Though the Mundell-Fleming framework is criticized by the lack sufficient micro-foundation, but we believe that this is still a useful framework to judge the policy interdependence under the world economy under float. In general, the beggar-thy-neighbor effect implies that in the short run there is a negative interactions such that  $\pi = x + \gamma(x - x^*)$ , and  $\pi^* = x^* + \gamma(x^* - x)$ , where  $\gamma$  is a small positive coefficient. (The results of this section, however, do not depend on the sign of  $\gamma$ .)

Suppose, as often thought, each country targets its own price level (and accompanying employment level in case there exists the Phillips curve.) The home country minimizes  $(\pi - a)^2 = (x + \gamma(x - x^*) - a)^2$ . And the foreign country minimizes:  $(\pi^* - a^*)^2 = (x^* + \gamma(x^* - x) - a^*)^2$ . The first order condition is given by a pair of equations:

$$\begin{aligned}(1 + \gamma)x - \gamma x^* &= a \\ -\gamma x + (1 + \gamma)x^* &= a^*\end{aligned}$$

It is easy to see that both countries can achieve their first best points. This does not depend on the sign of the spillover effect. In Figure 2, the interaction of the two lines indicates the combination of the first best for the countries. The indifference map does not show as eclipses but as straight lines. This is a typical case of strategic complements. The intersection point can correspond to the no-inflation situations in the two countries if both  $a$  and  $a^*$  are zero, but the results hold for non-zero values of  $a$  and  $a^*$ .



All the points on the reaction curves are bliss points. According the intersection P achieves the first best. (if  $a=a^*=0$ , then P coincides with the origin.)

One of us was aware in the earlier writing this important structural in the interactions of monetary policies between under fixed and floating rates. “Thus, for a nation to adopt a flexible exchange rate by itself is something very close to the maxi-min Strategy.” (Hamada 1974, 1985) In a sense, the Golden fetters (Eichengreen, 1992) and a similar balance of payments restraint were taken away under a floating rate, and a nation can choose its bliss point independent of the other country’s policies. No wonder little benefits were found with respect to the actual world macroeconomic model from international monetary coordination under float. (Oudiz and Sachs, 1982)



Now we can summarize our results: *Under the flexible rates, as far as the price levels are targets of countries, they can in principle achieve their bliss points by their monetary policies.*

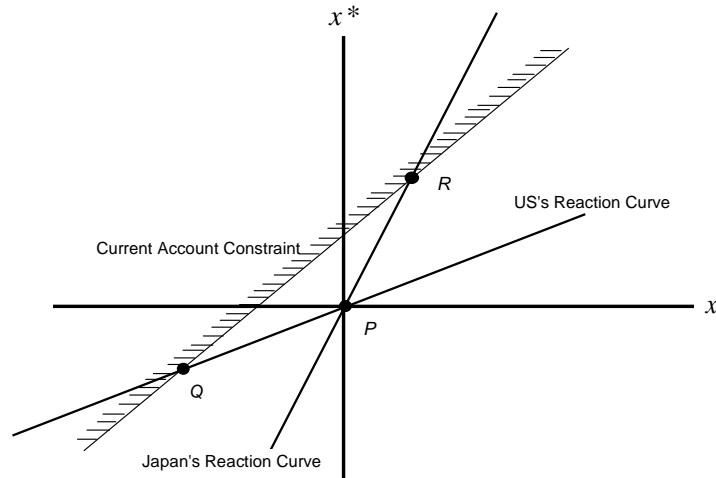
This principle has produced, however, an important exception. When Japan went into a zero-interest regime, a typical liquidity trap emerged. Therefore, monetary expansion can no longer achieve the first best policy. Somewhat ironically, as we will review, the “Great Intervention” is called for to solve this impasse.

### **2-3. The Flexible Exchange Rate with an Additional Balance of Payments Constraint**

Next we introduce the constraint on the current account of balance of payments. Consider the simplest case where  $b=b^*=0$ . Suppose a constraint is imposed to require a balanced current account for both countries. These objectives are consistent each other, if these constraints should happen to require that the monetary policy be symmetrical so that  $x=x^*$ . Then the new requirement that is written in the broken line in Figure 3 will pass through the intersection of two reaction curves derived in Figure 2. In that case, we would have a happy situation where the current account requirement coincides with the mutually agreeable choice of price levels or the unemployment levels. It will be argued in the next section, the current account balance does not correspond to the normal situation in the long run growth path of an economy.

Usually, the current account imbalances are the results of the savings-investment choice of the two countries, and a structural and long run phenomenon. It is not readily changed by the manipulation of monetary policy (See, McKinnon and Ohno). Consider the situation, however, as it might have happened after the Plaza, where policy makers misunderstood that the structural and long-term imbalance of current accounts could be manageable by macroeconomic policy. At that time, the US could not adopt more stringent fiscal policy, and Japan could not adopt more active fiscal policy. Then the monetary policies have to bear all the burden of adjustment. Again, policy makers might have erroneously thought that the combination of more restrictive monetary policy on the part of Japan and the expansionary monetary policy on the part of the United States would achieve the current account balance for both countries.

Figure 3  
(Flexible Exchange Rate with the restriction of the Current Account)



All the points on the reaction curves are bliss points. According the intersection P achieves the first best.  
(if  $a=a^*=0$ , then P coincides with the origin.)

Let the excess money creation in Japan measured by the horizontal axis and the excess money creation in the US by the vertical axis. If the policy makers thought that the more restriction on the side of the Japanese monetary policy would be necessary for the exchange rate adjustment, then they will restrict the choice by such a constraint as  $x \leq x^* - c$  where  $c$  is positive. Then by the imposition of the constraint, as in Figure 3, the available ranges for the monetary policies are limited. The combination of excess monetary creation at Q will be most desirable for the United States but undesirable for Japan, and the choice of R will be most desirable for Japan but undesirable for the United States. They have to settle at some point between Q and R. The imposition of current account equilibrium will bring back an additional constraint that would work exactly as straining as the as the reserve constraint under the fixed exchange rate. We can summarize: *Even under the flexible rate, the imposition of the current account equilibrium by the monetary policy will prevent the attainment of mutually desirable price levels.*

Of course, even under the flexible rate, fiscal policy could have been employed to adjust the current account imbalance. It is easy to interpret the above results in terms of the theory of effective assignment of economic policies originated from Tinbergen and Mundell. The flexible exchange rate system relinquished the target of the balance of payments and enables countries to choose its macroeconomic target of price levels freely. The introduction of current account target brings back the system back to the constrained system again. Moreover, the attempt to adjust the current account by monetary policy, or equivalently

exchange rate policy, instead of fiscal policy is nothing but a wrong assignment of policy instruments given the Mundell-Fleming framework.<foot note below> Under the modern approach incorporating the Ricardian equivalence, or the New Keynesian approach, even the introduction of fiscal policy could have a limited and only a temporary effect.

### **3. The Long Run Theory of International Capital Movements**

The assignment of monetary policy to the current account may not be a wrong policy, as we have seen, if the balance in the current account corresponds to the choices of proper price levels. In this section, by analyzing a long run real model of the growth of the world economy, we shall show that the balance of current account is not the warranted case. The disequilibrium in the current account can occur not as an exception but almost as a norm. In the following, we analyze a real economy with optimizing agent. This recovers to the discussion of a substantial micro-foundation but the model has little to do with the monetary policy or the nominal exchange rate. The total purpose of the following exercise is to show that the imbalance of current accounts is a normal macroeconomic phenomenon and anything but to be handled by monetary policy. The Plaza Accord and the subsequent consultations tried to deal with the basically real phenomenon with monetary cooperation and ended up with various monetary disturbances, or coercions.

In a single good growth model consisting of two countries, Hamada (2007) considered the question of what is the path of international capital movements under free capital mobility if two nations take the Ramsey-Cass-Koopmans type of optimal savings strategies. Under the assumption that the capital market delivers the marginal rate of returns to capital owners, and that each country takes the optimal strategy, it is shown that the Nash equilibrium of the two country model of strategic choices of savings depicts a path of capital movements that depend on the natural rates of growth and particularly on the rates of time preference in the two countries.

The analysis of different natural rates of growth, namely the sum of population growth and the labor augmenting technical progress, has to deal with the

situation where one country dominates the other by its economic scale. To avoid this complexity, we will discuss here the situation where there is a difference in the rates of time preference between the two countries. The key assumptions are:

- I. The capital market allocate physical capital efficiently at any instant of time in a static allocation of capital stock, and the marginal product of capital is paid to the owners of labor and capital.
- II. The savings decision is the only strategic variable to the owners of capital, and they play the open Nash strategy in the differential game of capital accumulation assuming that the other player's dynamic strategy of savings is chosen.

The second assumption is a standard extension of the Ramsey optimization to two players.<sup>1</sup>

Then, the world economy will converge to the stationary state where the rate of return to capital is equated to the average rate of time preference. Moreover, the stationary per capita borrowing of a less patient country, that is, the stationary per capita lending of a more patient country, is equal to the difference in the rates of time preference divided by the second derivative of production function.

From now on, modifying the notation of the Appendix (See Cheng and Hamada, 2007) where upper cases letters were used, let us write per-capita variables by lower case letters returning to conventions.  $k$ ,  $y$ , and  $b$  are now per capita value of capital stock, income, and borrowing (lending) divided by the identical population of the two countries. Then, we have, for the value of rate of returns

$$f'(k) = \frac{\rho_I + \rho_{II}}{2},$$

and the stationary value of indebtedness of the less patient country I, as

$$b = \frac{\rho_I - \rho_{II}}{-f''(k)}$$

In order to assess the magnitude of this value for a small difference in the rates of time preference, let us illustrate by a numerical example. Consider a per-capita production function for the borrowing economy as Cobb-Douglas type of  $f(k) = Ak^\alpha$ , where  $\alpha$  is 3/10, and  $k/y$  is 5, and the rate of return  $r = f'(k) = 0.06$ .

Since  $f''(k) = (\alpha - 1)f'(k)k^{-1}$ ,

$$b = \frac{\rho_I - \rho_{II}}{-f''(k)} = \frac{\rho_I - \rho_{II}}{(1 - \alpha)f'(k)} k = \frac{10}{7} \cdot \frac{100}{6} \cdot (\rho_I - \rho_{II})k$$

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<sup>1</sup> See Appendix for the derivation.

or

$$\frac{b}{k} = \frac{1000}{42} \cdot (\rho_I - \rho_{II})$$

Therefore, even a difference in the time preference by a 0.1 percent  $(\rho_I - \rho_{II}) = 1/1000$  would make  $b/k$  equal to about 2.38%. About the 2.38% of the total capital of the borrowing country will be owned, and the assumed capital output ratio of 5, the net debt position of the country would be close to 12% of its income. If the difference in the time preference is about a quarter percent (=0.25%), then the debt capital ratio would be close to 6 % and the debt income ratio would be close to 30%. The reader may calculate how big would be the impact of the difference in rates of time preference would be if it were, for example, a full percent.

This would be a good rationale for asserting that the current account balance or the absence of net indebtedness in the stationary state is not the norm but a strong assumption about the similarity of the rates of time preference between countries. As is indicated above, in the mutually optimizing model with the Ricardian equivalence, the government spending would not affect the stationary value of indebtedness. Fiscal policies could be only a temporally remedy of the indebtedness in the short run.

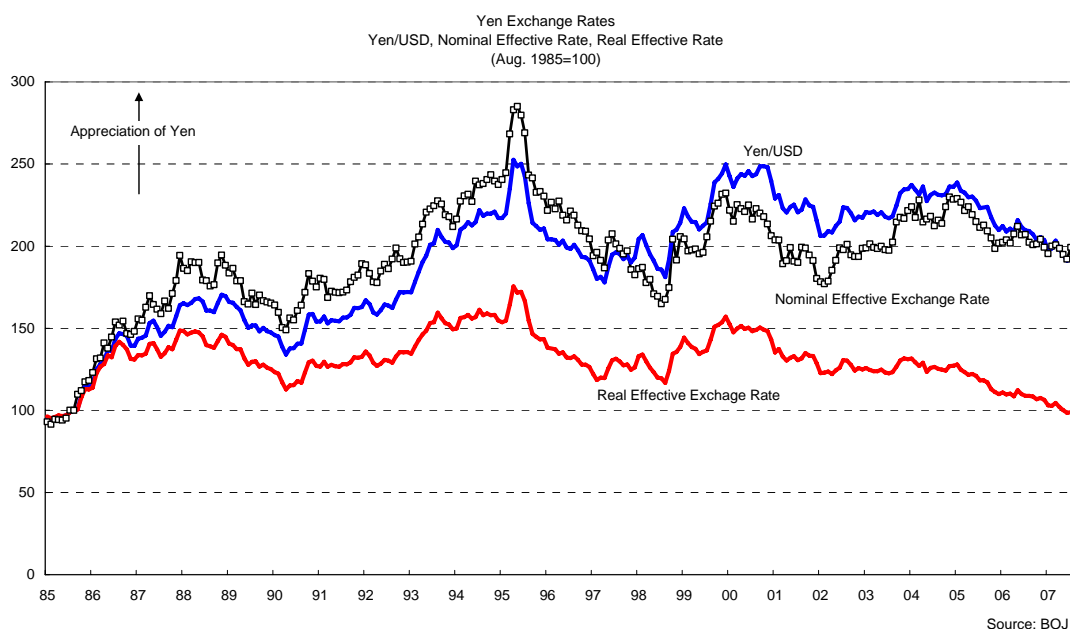
#### **4. Conceptual Difference between the Real Exchange Rate and the Terms of Trade**

With this abstract, if not a simplistic, theoretical perspective, let us stroll along the monetary history of Japan after 1985. Our guide is the movement of the real exchange rate of the yen, which shows something like an outside temperature that Japan faced during these twenty years. The dollar-yen real exchange rate is calculated as the dollar per yen nominal exchange rate multiplied by Japan's price level divided by the U.S. price level. We use the real effective real exchange rate weighted by the trade volumes to the world.

To ascertain the basic understanding of the role of the real exchange rate, let us discuss a simpler case of the dollar-yen U.S. real exchange rate.

Here the price levels may be those with respect to a particular industry, or the

general price levels like the GDP deflators. When a particular price level is used, then the real exchange rate indicates the competitive condition of the industry. When an overall deflator is used, it shows the general competitiveness between the countries.



If this real exchange rate calculated by the electronic price level is higher in terms of an export of an electronic product than before, then Japan's electronic industry has a higher hurdle to sell its product in the United States. For Japan's wine industry to import wine from the United States, a higher real exchange rate in terms of wine price would mean easier import. At the same time, for the competitor in the wine industry in Japan faces a higher hurdle again.

Thus, in general, the higher dollar-yen real exchange rate would mean a more difficult competing condition for Japan's industry. In the textbook trade model the nominal exchange rate would be realized by the balance between exports and imports. In the last section, we showed that it is not necessarily true in a growing world economy with different rates of time preference.

To most readers it may be obvious, but let us point out the difference between the real exchange rate and the terms of trade. Suppose good 1 (car) is an export of Japan, good 2 is a non traded good (service), and good 3 (natural gas) is an import of Japan. Suppose the relative price of natural gas is reduced relative to car, then it would be a terms of trade improvement in Japan. It will raise the potential (full employment) income of Japan. Whether this increases the real

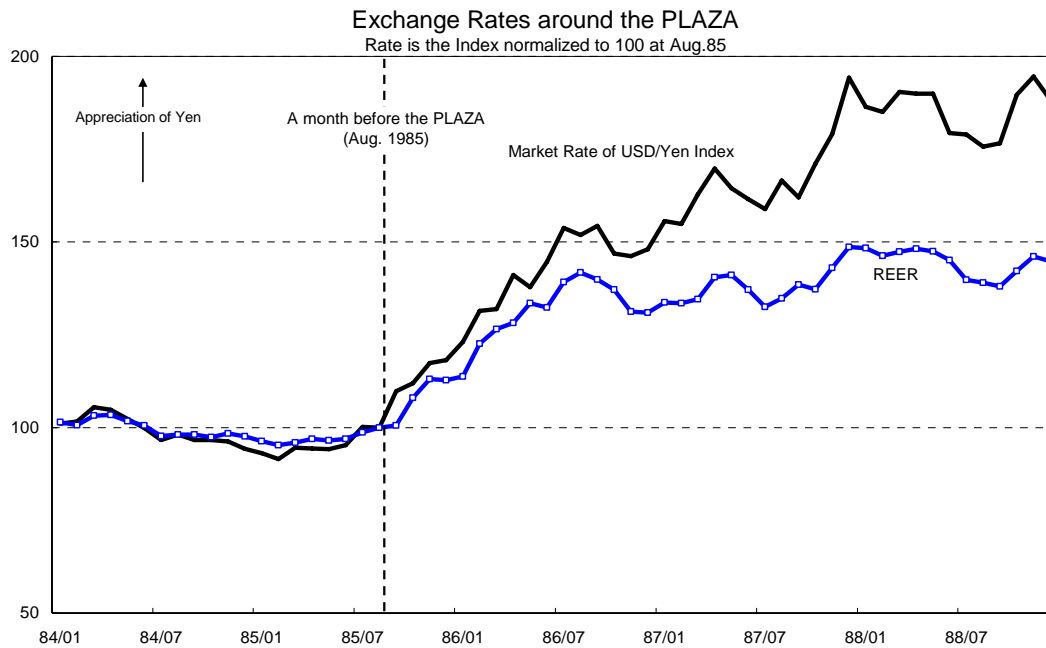
exchange rate does depend on the nominal price movements of goods in the export and import sectors.

To repeat, the full employment, potential, real income of Japan will be favorably affected by improved terms of trade. A higher level of real exchange rate will give more difficult competing conditions and accordingly more difficult adjustment process for those industries. If prices and wages fully adjust instantaneously, full employment will be kept. Then the level of the real exchange rate would hardly matter. History of twenty years after the Plaza shows that prices and wages are much less flexible as are taught in textbooks with classical flavor, and it shows that levels and changes in the real exchange rate had crucially important impacts on the macroeconomic performance of Japan. We owe this important observation to Jorgenson and Nomura (2007) who carefully calculated the competitive conditions that the Japanese industries had to face during the adjustment. The only difference in emphasis between their paper and ours is that, while they are more focused in the role of TFP growth in those industries, our paper is concerned more with the macroeconomic consequences of real exchange rate movements and various conditions that determined the course of the real exchange rate.

## **5. Tracing the historical events after the Plaza Accord**

Jorgenson and Nomura developed a convincing study of the industry-wide the yen-dollar real exchange rate calculated by corresponding price level in Japan and the United States. This study vividly shows how intensive conditions Japanese industries are imposed in accordance with rising nominal exchange rate. They had to adjusted my productivity gains or by reduction in prices. The responses of wage to these prices are to be studied farther. The following graph shows the movement of the real exchange rate of the yen plotted on the nominal effective exchange rate of the yen.

The following historical narrations are sketchy and raise more questions than give their answers. We hope, by viewing through the looking glass of real exchange rates, domestic macroeconomic issues in Japan present a clearer picture.



## 5-1. The Plaza Accord

In the Plaza Accord, Group of 5 (G5) countries (United States, Japan, Germany, United Kingdom and France) attempted a coordination of exchange rate interventions in order to recover the continuing trade balance of the United States. The macroeconomic policy of the United States was then the mixed extreme budget expansion by Reaganomics and the high interest policy to contain the inflation. As is predicted by the Mundell-Fleming framework, this type of policy mix would result in a large trade deficit and a higher value of the dollar. Many economists thought that this degree of trade imbalance was hard to maintain and that a drastic adjustment of exchange rate would be inevitable. American industries did not enjoy the decline in their competitiveness.

G5 countries did not want to experience a sudden decline in the dollar, and they made an attempt to reduce the value of dollar and to reduce the trade deficit of the United States by cooperating in interventions in the exchange market. The world had moved to the flexible rate regimes, and it did not appear that interventions could control the levels of exchange rates. International cooperation of the countries that occupied more than half of the world GDP could, they thought however, cope with the voluminous and volatile transactions in the free capital market.



At that time, Japan was experiencing a fairly good macroeconomic performance relative to other major countries, but its Achilles' heel was a large budget deficit. Therefore, Japan tried to rely primarily on the monetary policy. The Bank of Japan (BOJ) raised the call rate for two month later than the Plaza Accord from Oct. 24 to Dec. 18, and the Ministry of Finance (MOF) engaged in extensive sales of the dollar. This meant that interventions were supported by monetary policy, or in other words, un-sterilized so that their effect could be substantial. In fact, during the twenty four hours, the yen-dollar rate appreciated by about 20 yen.

At January 24, Finance Minister Takeshita gave a surprise to the market, saying "A dollar can be 190 yen". This indicated that policy makers thought that it was difficult to adjust the yen-dollar exchange rate down beyond 200 yen, which was around 250 yen before the Accord.

The plan of the Plaza Accord was secretly and jointly organized by participating countries, in particular, the United States, Japan and Germany, but since the exchange rate was set to the range that the United States economy can be viable. In this sense, this agreement is designed to satisfy primarily the need of the United States economy. One may say, therefore, the Plaza Accord was the Stackelberg equilibrium in the coordination game discussed in Section 2. The United States was the Stackelberg leader and other countries are followers.

## **5-2. The effect beyond expectations**

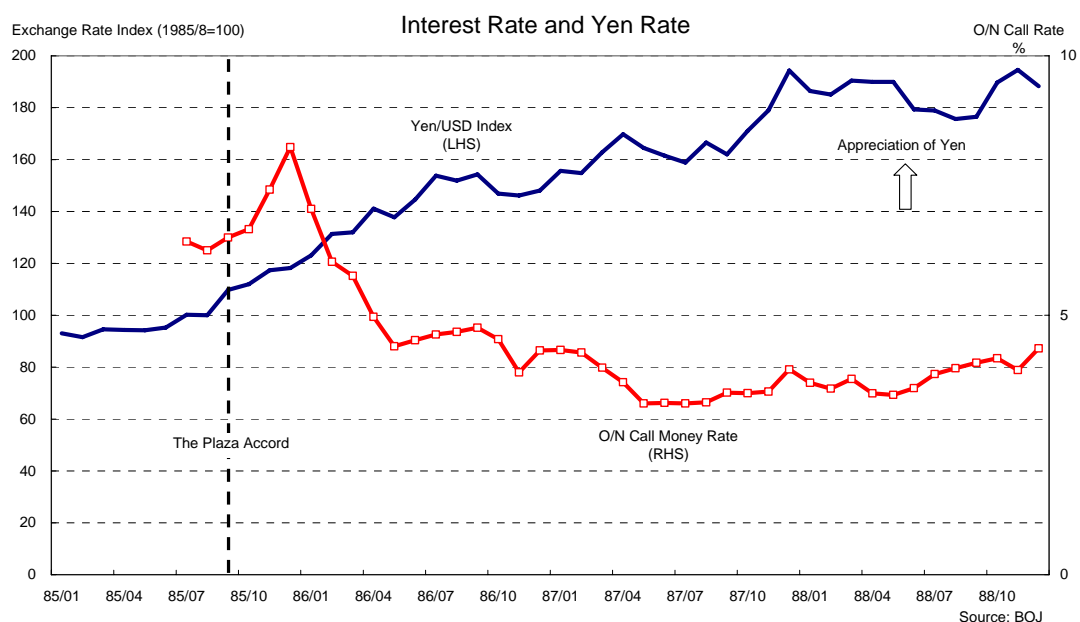
Policy makers thought that the yen would appreciate to around 200 yen per dollar. On the contrary to these expectations, the yen-dollar rate became 180s in February, 6 month after the Accord. The fact that the call rate, while being raised until December 1985, came down in January of 1986 showed that the yen appreciated more than policy makers expected and that they had to moderate the appreciation of the yen.

One year after the Plaza, the yen dollar rate was 153.6, which was an appreciation of the yen by 95 yen from the one-year average of the yen-dollar rate between September 1984 and August 1985. Thus, the intent of the Plaza Accord was well fulfilled, or, one might say, excessively achieved. The surprise announcement, the joint interventions of G5 in a coordinated fashion had a strong impact on the sentiment of the market.

In general, the exchange rate as a relative price of assets is to be determined by future expectations of the returns and the future expectations on monetary policy, as well as the current interest rates and the current excess demand by the monetary authority. The reason why the yen kept appreciating in spite of the lower interest policy of Japan was that market participants formed solid opinions that countries would stick to the policy of allowing the higher yen as long as the trade deficit of the United States would continue.

### 5-3. Lower interest policy and appreciation of exchange rate

The first puzzle of the whole process was why the yen kept appreciating despite of the change of the stance of Japan's monetary policy to lowering interest rate after January 1986 as shown in Figure <Fig #? >. We might tentatively answer this question as follows: The total stances of G-5 countries towards future was impressed so firmly in the mind of the public that the trend of the yen appreciation was taken for granted in spite of interventions and interest changes that were considered rather temporary.



In a classical, frictionless world, changes in the nominal exchange rate do not necessarily cause changes in the real exchange rate. If money remains neutral, the real exchange rate automatically adjusts to real shocks. The nominal exchange rate does not change the real exchange rate unless there is an accompanying change in real factors. In a real world after the Accord, however, the movement of real exchange rate followed for a while really closely in a

parallel fashion the movement of the nominal exchange rate after the Accord, and fairly closely even after one year anniversary of the Accord.

This gives a lesson that, in the open economy at least, money could not be neutral instantaneously. This was why the nominal, even the verbal, manipulation of exchange rate did give the world a substantial real impact. One of the rationales of this paper is to trace the impact of nominal exchange rate on the real economy by tracing the path of the real exchange rate Japan faced. It might be too simple minded to say that the Plaza Accord and the following joint interventions laid the foundation of the high real exchange rate of the yen, but at the first few years there was little doubt that the Accord played its role as a catalyst by embedding the stance of the Japanese monetary authorities toward the future.

#### **5-4. The failure of the Louvre Accord and the Black Monday**

It seemed that the Plaza Accord embedded the yen-appreciating psychology even more than intended by policy makers and that the dollar started suddenly depreciating against most major currencies. The G-7 group, which was the enlarged G-5 by adding Italy and Canada, was concerned with the excessive dollar depreciation that they thought might trigger international monetary impasses. They gathered in the suburb of Paris, Louvre (Palais du Louvre), and set up an agreement to stabilize major currencies. Namely, they agreed on the joint interventions, and coordinated monetary and fiscal policies to maintain the yen/dollar rate between 140 and 160, and to maintain the mark/dollar rate between 1.8 to 1.9, both as reference ranges. This was politically endorsed in the Venice Summit as well as in the Finance Ministers and Central Bank Governors' meeting of G7. This accord was found soon to be infeasible to achieve. (See also Ito, 1992)

In order to realize the Louvre Accord, the United States had to keep the interest rate higher than other major countries, but the United States was reluctant to take this measure in consideration of its own business conditions. Then in Japan and Germany, the economic recovery was obvious and both central banks started to raise interest rates. The Louvre Accord was in conflict with the domestic macroeconomic objectives in all these countries, and international achievement of the joint objectives of current account became difficult to achieve. More importantly, the market perceived that the target of the Louvre Accord would be unlikely to be realized.

As discussed clearly in Ito (1992), there were talks of implicit target zones. Target zones might have worked if they were well announced and if the market trusts the commitment to the promise of the government. Neither were announcements made and nor credibility emerged.

The market was in somewhat unstable situation when the New York stock exchange recorded a sudden fall of 508 dollars in the Dow Jones Index on the Black Monday of October 19, 1987. The shock waves went around the world. The dollar depreciated on 29<sup>th</sup> of October and went down to the yen dollar rate of 133 yen on November 10. Thus, the content of Louvre agreement became suddenly out of context. To repeat, if an international agreement was not compatible with the objectives of domestic economy, the market will never endorse the content of the international commitment.

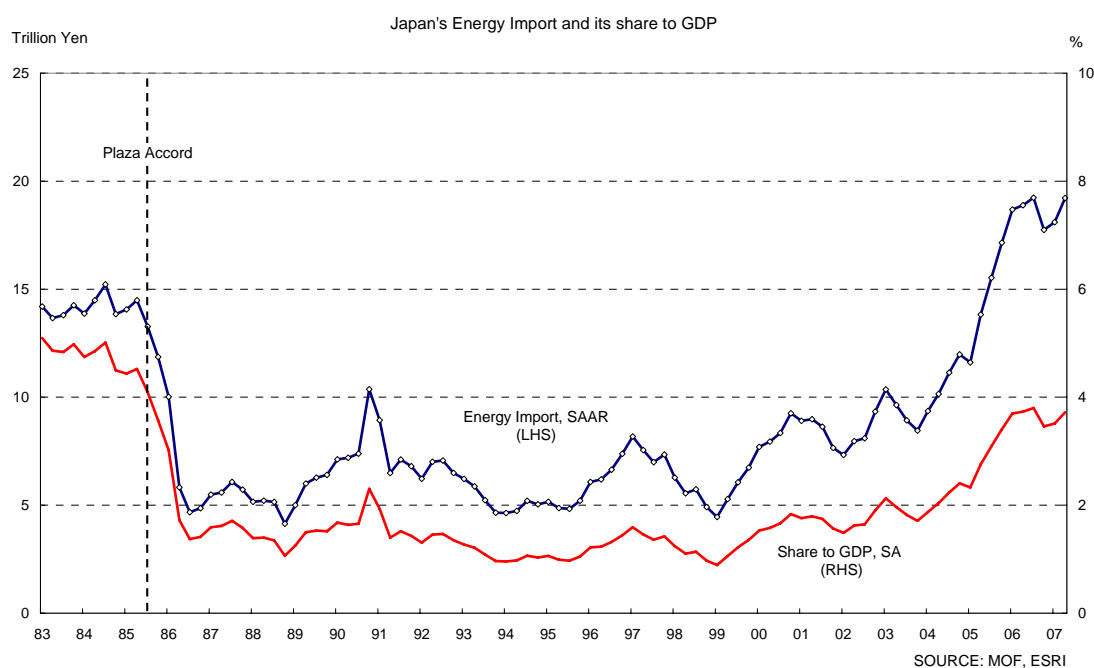
#### **5-5. Why was the low interest policy sustained for such a long time?**

The second puzzle of this period is then why Japan did not keep its interest higher if the target is to resolve the United States' high trade deficit. The tentative answer would be that the shock of Black Monday was so strong that monetary authorities outside the United States could not conceive of anything than reducing their interest rates. And the BOJ was no exception.

The continuing process of yen appreciation did continue despite of the decrease in the call interest rate in Japan that maintained only 2 month long from October to December. Though the yen as well as the mark appreciated a great deal, the world economy including Japan and Germany went into a sustained growth period. The third, and one of the most important puzzles, is then why Japan and Germany grew rapidly even in the presence of the appreciation of the yen and the mark.

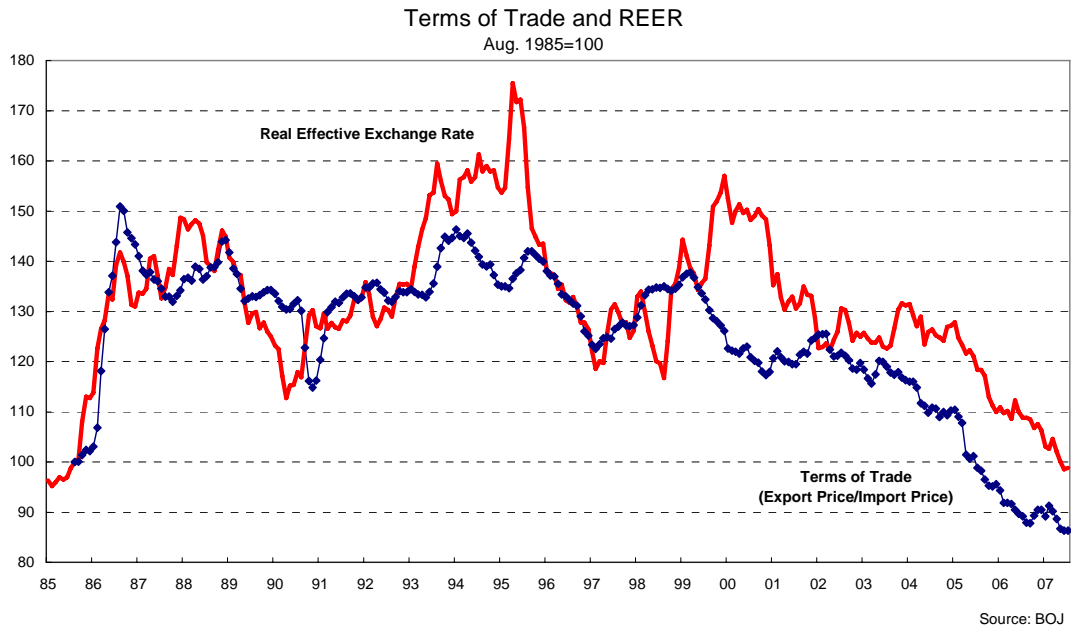
The major key to this puzzle seems to be found in the improvement in the terms of trade due to the fall of energy price. Energy price fell about 50 percent in its dollar price (for example, Japan's import price Index of crude oil in US dollar term dropped 49% at August of 1986) and the yen was about 50 percent appreciated. The energy price in terms of the yen fell into a quarter of the previous level. In case of Japan, the ratio of imported energy to GDP fell from 8% in 1980 to 2% in 1997. Thus, the terms of trade appreciation worked as transfer payments to Japan, and expanded its potential income. Since the energy

consumption had a low elasticity to its price in the short run, the terms of trade effect worked as if a large transfer of about 3 % of income were made to the Japanese public.



This favorable, long run, effect expanding the permanent income of Japan worked through the service industry like distribution, transportation and travel, and this effect probably offset the unfavorable, short run, effect suffered in the export or import competing industries. This created the heap of “three highs, the high yen, the high stocks, and the high bonds--- *en-daka, kabu-daka, and saiken-daka.*” In terms of the framework presented in the previous section, the total full employment benefit of the terms of trade is obvious. In the short run with price wage rigidity, the terms of trade change, for example, in terms of the decline in energy without changing other price levels would give a harder condition for the domestic energy producing industry, which was minimal in case of Japan.

In the following chart, we observe that when the nominal exchange rate appreciates and drives up the real exchange rate of the yen, most likely the terms of trade improved for Japan accompanied. Yen’s appreciation with respect to dollars would have improved the terms of trade since the prices of energy that occupied the most important part of Japan’s import products were denominated in dollars. Therefore often the unfavorable real exchange rate effect was offset by the favorable effect of the terms of trade improvement, as is seen as parallel



movement the graph. When the rise of terms of trade is missing or insufficient relative to the rise of hurdles in terms of the real exchange rate, we generally observed the slump of the Japanese economy, for example between 1992-95, and after 1999.

In face of unexpected expansions, Germany and Japan attempted to convert their monetary policy to a tighter one. In Japan, the call rate hit the 4.4 % bottom and it recovered gradually to 4.76 % in September. The Black Monday reversed this course to bring the call rate down to 3.81% in November. It was not until September of 1988, a year later that the call rate was brought back to the 4% level.

It is quite reasonable that this delay of monetary policy was the cause of the extreme boon in the stock market. From the writing by Shijuro Ogata and other Bank of Japan, many Bank of Japan officials were reluctant to pursue the expansionary policy, kind of imposed by the Ministry of Finance.<sup>2</sup> The often used rhetoric during this time was that Japan kept its macroeconomic policy expansionary because of the policy coordination. This logic might have been

<sup>2</sup> On the other hand, McKinnon and Ohno (1997) cite a paper by Tomohiko Taniguchi (Taniguchi 1993) that refers to a BOJ official (unrevealing his identity) who said the increase in asset prices was intended by the BOJ so that the expansion with domestic demand would be achieved by the increased consumption and investments by the asset effect of booming stocks and land prices.

justified for the case of the fiscal policy, but not at all for the case of the monetary policy. In presence of price and wage rigidity, monetary expansion was most likely to exhibit negative spill over to other countries under the flexible exchange rate. The need for monetary expansion for the cooperation purpose was never to be warranted. Thus “monetary coordination” was used not as a genuine rationale but as a pretext for lower yen that would presumably assist the interest of export industries.

**5-6. Why did the monetary constraint by the BOJ become so stringent?**

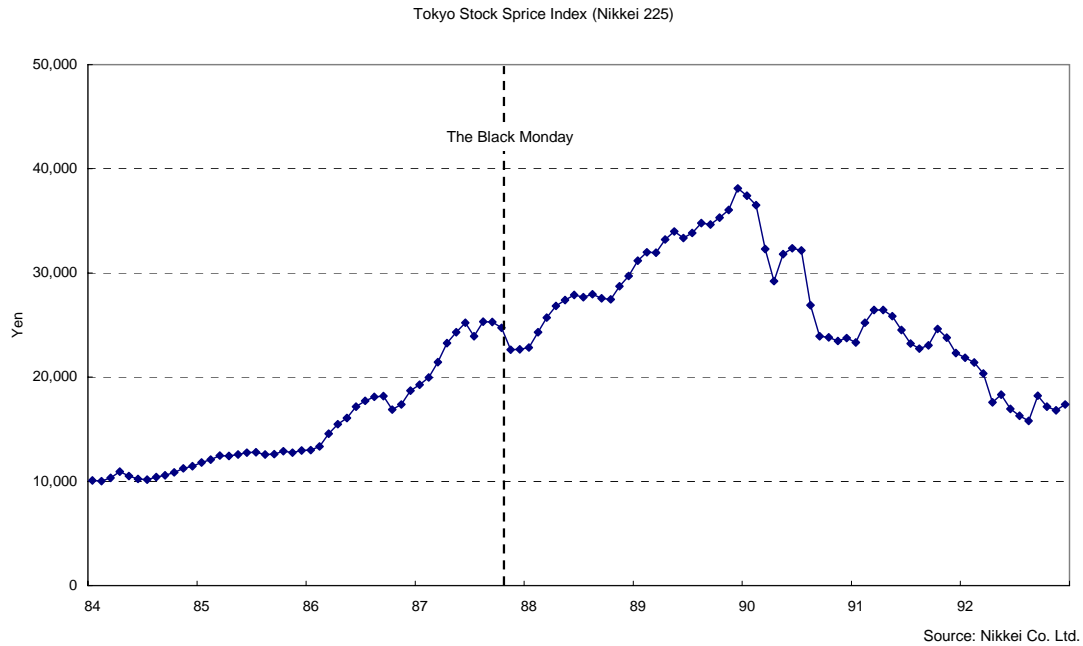
### **Stock Market and Bubble**

Then comes the question that has the greatest importance for the long “lost decade” of Japan. After the middle of 1988, the BOJ finally changed its stance of monetary lenience to monetary restraint. Just as long was the period of lenience; hard was the attitude of its monetary austerity after the turning point. The BOJ’s attitude could be well understood if it had believed that the BOJ made mistakes in overestimating the damage of the Black Monday and that the very active stock market boom during 1988 to 1989 exhibited abnormal diversion from fundamentals. This diversion was regarded to have been caused by the erroneous and unusual monetary policy reacting to the Black Monday.

This conjecture can be made from observing the movement of the Tokyo stock price index (Nikkei 225), which was a little more than 20,000 during 1987, soared close to 40,000 at the end of 1989, and came finally down to 20 thousand in the latter half of 1991. According to their view, presumably the stock market boom caused by the allegedly wrong judgment about the monetary policy nearly imposed from outside, in particular, the Ministry of Finance, continued to 1991. Moreover, the Gulf war started in summer of 1990, and the oil price increased rapidly. This was another rationale for the call interest rate to be kept over 6% until the end of 1991.<sup>3</sup>

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<sup>3</sup> According to the usual usage of economists, a bubble brought about by excessive monetary policy was not a bubble. According to the journalist usage as well as the common usage of BOJ or MOF, however, the stock market increase caused by excessive monetary policy was a bubble. In this sense, the bubble in the stock market was judged by BOJ or MOF officials to have returned to normal after 1991.



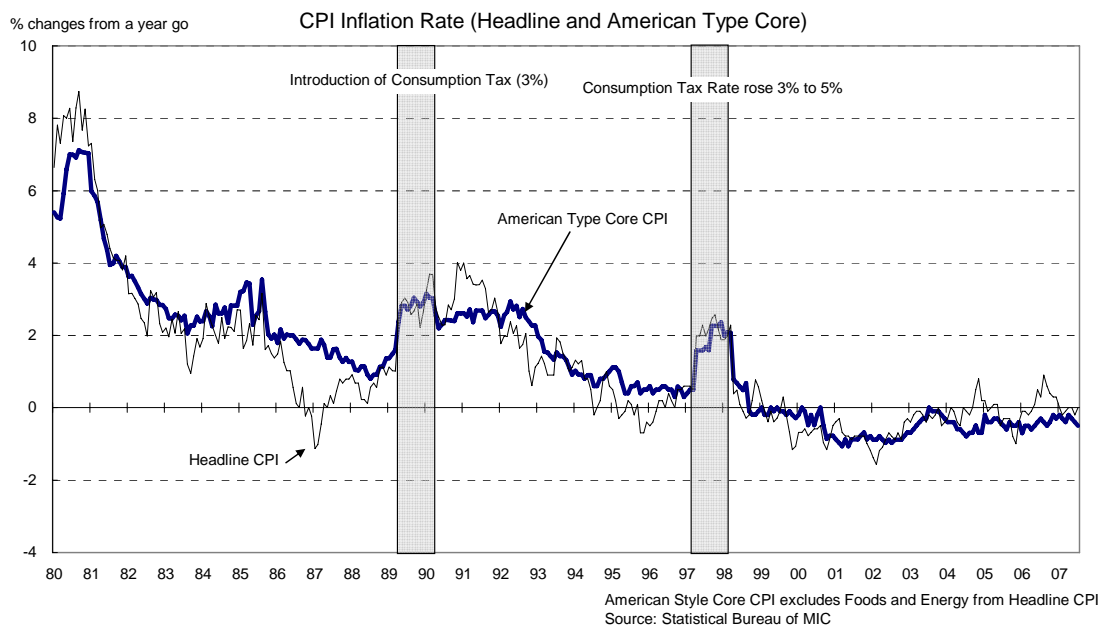
The process of containing the “bubble” did not appear effective at the first instant. The constraint on the quantitative lending, “the total restriction of lending,” was also adopted. As Horiuchi (1980) already clarified for the banks’ lending in Japan in general, however, such constraint might have affected the share of channels of lending but could not have affected much the total financing of land or stocks. In fact, non-banking agricultural financial institutions (norin-kei kinyu kikan) increased the lion’s share of lending because of the restriction on the lending through banks. Even worse, the political clout of those agricultural financial institutions was really strong; most of the liabilities originated from unsound lending to land were shifted to the banking sector. This created not only the incentive problems for future finances but made the financial health of banks deteriorated as well as uncertain. Then they became serious about the crisis in the stock market because even the 20 thousand levels were found to be impossible to sustain even after the rate of interest started decline.

### Inflation

Since the CPI inflation rate was close to 4% at the later half of 1991, it might be understandable that the BOJ tried to curb the inflation by monetary restraint because it was believed that the BOJ will never allow the rate of inflation over five percent. This view justifies the claim that the BOJ tried to contain the price inflation caused by the Gulf War. The picture looks different, however, if we tale as the price index, the Core price index that takes away the effect of fresh food



and energy. The Core index never exhibit rates of inflation more than 3 percent by year 1991.



### The delay in returning back to monetary expansion

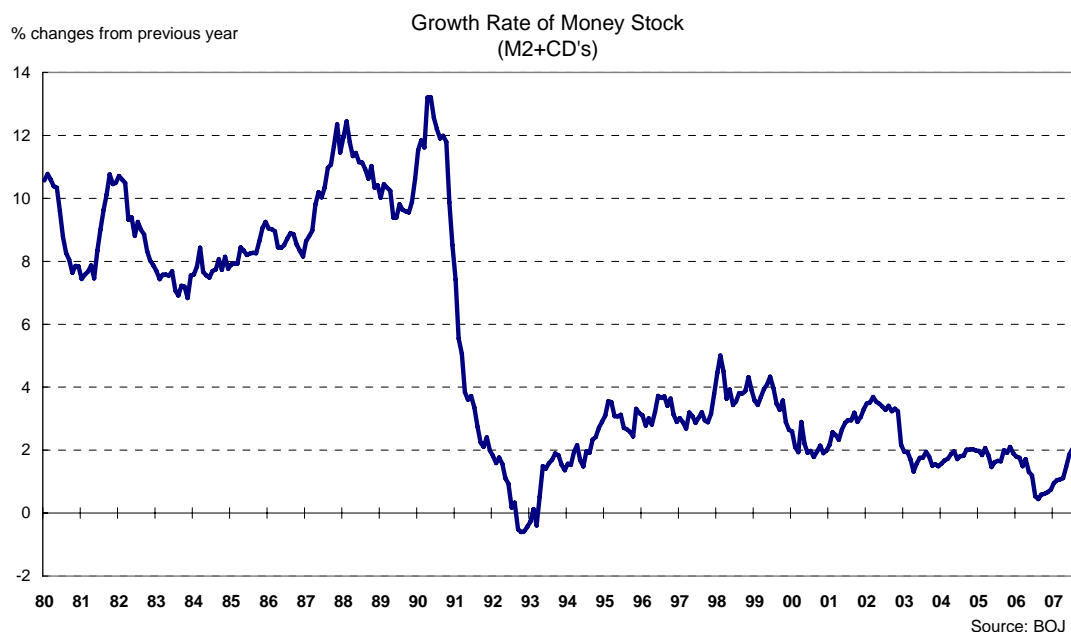
Accordingly, the monetary contraction in face of the drastic stock market break down and targeted to the apparent CPI increase that accompanied the oil price exactly reversed the macroeconomic variables that followed the move to a “bubble”. The possibility of danger due to the delay in returning back to monetary expansion was clearly depicted by the authors in the Federal Reserve in the United States (Ahearnes and others 2002). The paper was presumably written in order for the Federal Reserve not to be trapped in the impasse to which the BOJ was unfortunately guided. Perhaps reflecting the spirit of comradeship between the central banks, the paper shows ample sympathy for the conduct of the BOJ by suggesting that Japan’s deflation was almost impossible to predict. The following two paragraphs still summarize their points. The first paragraph was technically supported by the analysis of the modified Taylor rule (See the growth of M2 Figure).

*“While the loosening of monetary policy in the early 1990s by the Bank of Japan (BOJ) seemed appropriate given the expectations of future economic developments at that time, in light of the weakening of spending and prices that took places subsequently, this loosening proved to be inadequate. ---perhaps the most important concern raised by Japanese policy during this period was not that policymakers did not predict the oncoming deflationary slump --- but they did not take out sufficient*

*insurance against downside risks through a precautionary further loosening of monetary policy. (page 4)”*

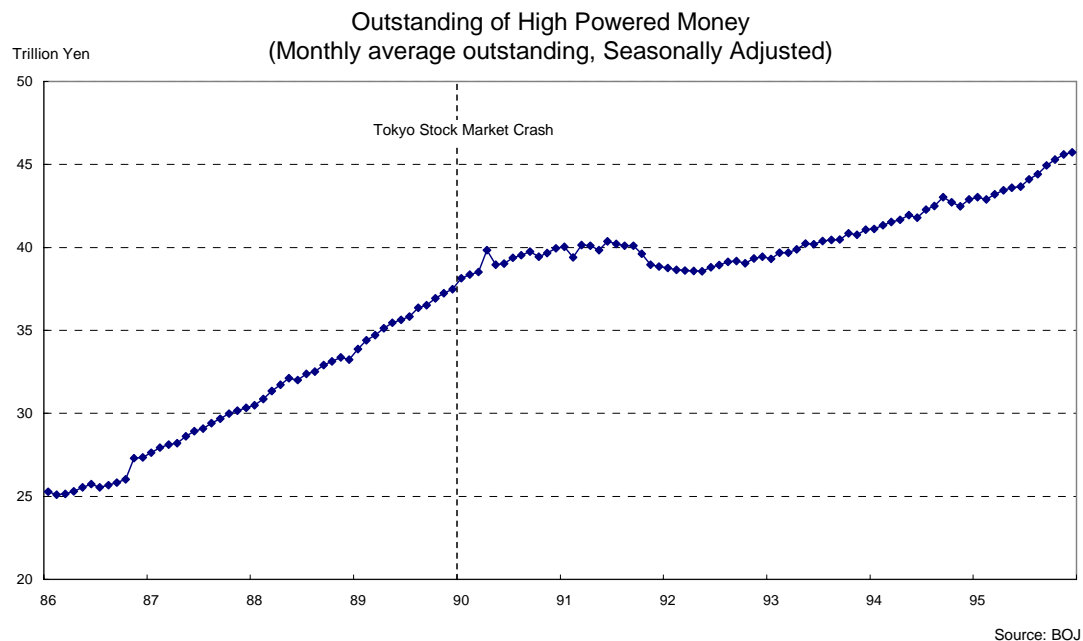
*“Growth of <a broad liquidity (M3), M2 and CDs, and the monetary base of Japan> fell nearly continuously from 1990 to 1992, perhaps indicative of excessive policy tightness. Moreover, while the growth of the monetary base picked up thereafter, the growth rates of the broader aggregate--- particularly M2 and CDs--- recovered by less, suggesting that the BOJ’s reduction in interest rates, substantial as they were, may not have been sufficient. (page 23)”*

Their paper also points out that, as a background, there were announcement by Governor Hayami that too low interest rates invite the moral hazard and by Deputy Governor Yamaguchi of the BOJ that decisive monetary easing might have dampened the restructuring efforts at Japanese financial institutions. Behind the scene of the ever rising real rate of the yen exchange rate, existed the firm belief that the alleged bubble was mistakenly created by the excess liquidity created by the BOJ and that the monetary austerity should be continued until the stock and land price would return to the “normal” level.



Why did the deflation occur though the level of the money supply (almost) did not decrease though the expansion rate of it decreased? If the economy started from very low inflation rate condition, *reduction in the expansion rate of money supply* in the long term by the central bank can reduce not only the inflation rate but also *level of prices*. This is not a classical type of deflation by a contraction of

money supply, but a transitory price dynamics by a declining of long-term inflation expectation (See Okada, 2006).



## 5-7. The Great Intervention Episode

It will leave the paper incomplete if we do not mention the role of the massive wave of interventions conducted by the Ministry of Finance, and delivered by its Vice Minister, Zembei Mizoguchi, starting spring 2003. One has to understand the background of the period, when the United States attempted to cope with the break down of the IT bubbles by lowering the federal funds rate within the 1% level, and by incurring a large amount of government deficit. Market participants who remembered a huge collapse of the dollar under the Carter administration in 1978 naturally expected to worry about the further depreciation of the dollar.

On the other side of the Pacific, the Resona Bank of Japan was virtually nationalized and government funds of 2 trillion yen were mandatory injected into the bank. This event seemed to have removed one of the most serious downward elements for the Tokyo stock market. This created the turn over of foreign funds that used to be in short positions. Moreover, while the Japanese government did penalize the management of the Resona bank, it did not penalize stockholders of the equities of the bank.<sup>4</sup>

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<sup>4</sup> Therefore, both factors across the Ocean, monetary ease in the United States and Japan's reform in the financial market, implied a strong trend for the future

As is well known, Japan's money market was deep in the liquidity trap. Japan's monetary policy with respect to the high-powered money alone could not increase a broader category of money and cannot influence the exchange rate. The remedies could have been found in the inflation targeting from the deflationary side, and direct interventions in the exchange market. The first option was politically infeasible. The second option remained virtually as the only one.

Here came the "Great Intervention," dubbed by Taylor (2007) and it gave Mizoguchi a nickname of Mr. Dollar. We consider, in light of the back ground that the role of the "Great Intervention" was really critical to cope with the potential pressure for the nominal yen appreciation and the resulting effect on industries through the real yen appreciation.

Many economists study the time series property of the Mizoguchi interventions and conclude that the effect is a little more than smoothing. However, the effect of interventions should not be judged by how a daily changes of interventions affected short time fluctuations of exchange rates, but by the counterfactual comparison between the hypothetical yen exchange rate in absence of the interventions and the actual exchange rates in the presence of interventions. It is important that Fukao (2005) calculated this difference. According to him, interventions succeeded to reduce the real yen exchange rate by 21 percent.

## 6. Concluding Remarks

We showed in this paper that the monetary coordination under the floating rate is useless and that it can become harmful when extraneous objectives of current account balances are introduced. In case of Japan, the Plaza Accord started the imposition of unnecessary constraint on the current account sought through the increase in the real exchange rate.

In the second half of the paper, we traced the macroeconomic factors that led Japan into such a long period of ordeal. Many factors initiated and prolonged the recession of the Japanese economy. It may be not too farfetched to imagine, though, that the exchange rate manipulation after the Plaza accord could have been one of the cornerstones that laid out monetary conditions for this long

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of the yen.

recession.

The combination of relatively restrictive monetary policy and exchange management taken by Japan launched a journey of the real yen exchange rate and did not allow it to return to its pre-Accord level until very recently. That is to say, the policy mix carried the real exchange rate to such a height that brought heavy burdens on many sectors of industry that required a long time for adjustment, though occasionally the Japanese industry could take a breath by improving terms of trade.

After Japan fell into the liquidity trap, monetary policy was neither enough to recover its desirable price level nor an appropriate exchange rate to locate the real exchange rate to revive the economy. Thus came the role of the “Great Intervention” to play (Taylor, 2007).

We have traced the path of the real exchange rate of the yen because it measures the external competitive pressure that Japanese industry faces. The Plaza Accord raised most drastically the real exchange rate because it was not expected. Even though the Plaza Accord was not necessarily the reason that Japan experienced a high real rate later on, we may be allowed to say that the Accord certainly liberated the real exchange rate to wander into the upward direction. Even during the time of boom in the late 1980s, the real exchange rate stayed quite high for the yen.

Once the monetary authorities found out the degree of monetary ease was too generous, they turned to very austere policies. The real exchange rate increased to the extent that the overvaluation of yen was 78 percent at 1995 in terms of GDP deflators (Jorgenson and Nomura, 2007). The strain on the Japanese economy must have been really serious.

In the future, the monetary authorities may as well be aware of the level of changing real exchange rate. Also they should know the differential effects of monetary and fiscal policies under price rigidity and inertia. The framework by Mundell and Fleming may be scrutinized and modified by dynamic considerations, but many of the lessons from the framework still seem to be applicable policy situations as long as prices exhibit some rigidity and inertia.

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