

“Interventions and Japanese Economic Recovery”

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1. Introduction

The Japanese monetary authorities (the Ministry of Finance and the Bank of Japan) intervened in the yen/dollar market, selling 35 trillion yen, during the 15-month period from January 2003 to March 2004. The size of interventions were unusually large, reaching 7 percent of GDP, and exceeding the total amount of interventions during the 11-year period from April 1991 to December 2002. Why did the Japanese authorities intervene with such a large amount?

This paper attempts to explain possible reasons and objectives behind interventions conducted by the Japanese monetary authorities in 2003 and 2004, and to discuss whether interventions achieved presumed objectives, flexible but rational foreign exchange markets and economic recovery. In the discussion of interventions, it is necessary to pay a significant attention to macroeconomic conditions, as decisions of interventions should be explained in the context of macroeconomic conditions at the time. When the 15-month episode of interventions started in January 2003, the Japanese economy was in a very weak condition. Several major banks were regarded in the market to be near-insolvent if proper accounting and evaluation of assets were applied.¹ Deflation was worsening and the growth rate was very low. The stock prices were declining sharply. The start of intervention in January 2003 was to keep the yen from appreciating in the midst of financial and macroeconomic weakness. The stock prices continued to go down until April, and the economy looked quite fragile in the spring. The economy started to show some strength in the second half, but interventions continued, with a brief pause of interventions in September. Reasons that would support interventions after September are two-fold. First, interventions provided opportunities of unsterilized interventions. Second, the monetary authorities

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¹ In order to clear the 8% capital adequacy standard, major banks were relying on deferred tax assets, which have zero liquidation value. What revealed in the subsequent failures of Resona Bank in May 2003 and revelation of large losses of UFJ Bank, solvency of some of the major banks in the spring of 2003 was quite doubtful.

were extremely sensitive to speculative activities in the market. Whenever the net positions on the yen turned long, interventions were conducted. This continued until March 2004. The intervention stopped in the mid-March, and the yen stayed at around the level of the last day of intervention until the time of this writing.

The rest of this paper is organized as follows. Interventions and the macroeconomic conditions from a broader perspective will be described in Section 2. More micro probe into intervention strategies will be conducted in Section 3. Sections 4 will attempt to explain the reasons for heavy interventions from January 2003 to March 2004, and Section 5 concludes the paper.

2. Macroeconomic Conditions

Repeated recessions have long plagued Japan since the burst bubble in the early 1990s. The average growth rate between 1992 and 2003 is about 1 %, compared to the average of 4% from mid-1970s to 1992, as shown in [Figure 1](#).² Although there were a few times that the growth rate exceeded 3%, the recovery was followed by the recession. In 1998 and 2002, the growth rate became negative, first time since 1974, which was the year after the first oil crisis. Financial crisis and economic slump reinforced each other from 1998 to 2002.

Insert [Figure 1](#)

Let us look at the developments of macroeconomic fundamentals from 2001 to June 2004. [Table 1](#) is the opening paragraphs of monthly reports of the Bank of Japan during this period. I attached the numerical value to each paragraph as my interpretation of the Bank of Japan interpretation of the direction of the economy at the time. The Bank of Japan was most concerned about the decline in economic activities from December 2001 to February 2002. The rest of 2002, the Bank of Japan maintained very cautious in assessing the economic situations, although the decline had been stopped: “Japan’s economy has stabilized as a whole” (Monthly Report, October 2002 to January 2003), “Economic activity remains flat” (Monthly Report, February to May 2003), and “Economic activity remains virtually flat” (Monthly Report, June-September 2003). The assessment became slightly positive only in October 2003: “Japan’s economy is recovering gradually” (Monthly Report, October 2003). The assessment became more

² See Bayoumi and Collyns (2000) and Callen and Ostry (2003) for IMF views on factors explaining poor macroeconomic performance of the Japanese economy in the 1990s.

optimistic only in April 2004: “Japan's economy continues to recover gradually, and domestic demand is becoming firmer.” The history shows that the Bank of Japan was most concerned about the health of the economy from June 2001 to May 2002, and remained non-optimistic until September 2003. This is important in assessing appropriateness of interventions if interventions were conducted to help economic recovery.

Insert [Table 1](#)

Now, let us look at the macroeconomic indicators, and compare those indicators with the intervention timings. [Table 2](#) shows, among others, the monthly (percent) changes in stock prices and the yen/dollar rate; quarterly growth rate, inflation rate, and the Bank of Japan view that was created in [Table 1](#). These are relevant variables that may help explain intervention behavior as well as other policy actions. Interventions between January 2001 and December 2002 are concentrated in two clusters, one in September 2001, and another in May-June 2002. The September 2001 episode can be explained by yen appreciation (4.7 % in August 2001) with the background of very weak macro fundamentals (negative growth and sharp declines in stock prices (20% in three months from May to August 2001). The Bank of Japan view on the economy was quickly turning pessimistic. Indeed, yen appreciation when macro fundamentals are weakening was regarded as inappropriate. Intervention in September 2001 was to fight against irrational movement of the exchange rate. Similarly, the economy was regarded as very weak as the growth rate had been in the negative territory for four quarters in a row prior to May 2002, and the Bank of Japan view on the economy was still very pessimistic. Yen appreciation by ten percent in three months during the period of the weak economy was again considered to be harmful and irrational. Therefore rapid appreciation during the weak economy, which was considered to be movement in the wrong direction, prompted interventions. In short, the market was wrong, and the message must be sent.

Insert [Table 2](#)

Ito (2003; 2004a) showed that there were two different regimes of interventions since April 1991, the beginning of the period that data are disclosed. The first regime, April 1991 to June 1995, is characterized by small-scale, frequent interventions, the second regime, from June 1995 to December 2002, by large-scale, infrequent interventions.

He attributed to the difference to the deliberate switch of strategy by Mr. Sakakibara, who became Director General in June 1995. The Sakakibara strategy was succeeded by Mr. Kuroda became in charge of intervention in July 1999. Mr. Kuroda retired on January 14, 2003, and was succeeded by Mr. Mizoguchi. Mr. Mizoguchi started to intervene on January 15, 2003, the first intervention of what would become the third regime—large-scale, frequent interventions.

The two interventions, September 2001 and May-June 2002, were typical of the Sakakibara-Kuroda interventions. When the foreign exchange market is considered to be heading in the wrong direction—wrong judged from macro-fundamentals—and the movement is too rapid, then interventions were employed with large amounts to send strong messages.

The new-type of intervention, under Mizoguchi, started in January 2003 continued until March 2004. During the fifteen months, macroeconomic fundamentals continued to become brighter. In the beginning of 2003, the Japanese economy was at precarious position. Stock prices were declining and economic activities were “flat.” Nikkei stock price index went down to 7,600, one-fifth of the peak that was recorded in thirteen years ago.³ The decline in the stock prices weakened many financial institutions that held large amount of equities on the balance sheet. The mood was near crisis, and any help, including interventions to prevent yen appreciation, could be justified. From January to March 2003, yen appreciation in the weak economy was understandable from the strategy of predecessor, although the frequency of interventions was much higher in this regime. Interventions from May to August 2003 were conducted in the economy on the way of recovery. The GDP growth rate of the second quarter of 2003 was more than 4%, although it was not until August that the recovery was known to the public. The Bank of Japan view was still “virtually flat” from June to September 2003. The CPI inflation rate was rising from minus 0.8 in January 2003 to minus 0.1% in August 2003. This was another sign that the worst had been over, but without certainty. Despite large-scale interventions, the yen appreciated from 119 yen/dollar in the beginning of 2003 to 107 yen/dollar at the end of 2003. The interventions from January to December 2003 can be characterized as an operation to prevent sharp yen appreciation that might have prevented the economy from getting back on a recovery track. Interventions moderated the speed of yen appreciation, while the flexibility of the

³ Since the index composition has been changed, the direct comparison of the Nikkei number of 2003 to that of 1989 is not totally accurate.

exchange rate was maintained. Interventions of 2003 bought time until the economy recovered and the stock prices rose to a comfortable level.

The Bank of Japan view was pointing out a “gradual recovery” from October 2003 to May 2004. The stock prices were also rising in this period. The mood was definitely brighter for many of the industries at end-2003, compared to a year ago. In retrospect, the Japanese economy was making a strong recovery, in terms of growth rate, in the fourth quarter of 2003 and the first quarter of 2004—7.6% and 6.4%, respectively—but that information was not available in real time.⁴

At the time of this writing (October 2004), the Japanese economy seems to be finally getting out of a long stagnation. Growth rate is nearing what many consider the potential rate. Deflation is almost over. But, recovery is driven by exports and fixed investment. Consumption is yet to grow strongly.

3. Interventions in 2003-2004: How did it start and how did it end?

Intervention on January 15, 2003, first time in six months, was carried out without notice of the market. The amount was 8.3 billion yen (or about 70 million dollars), a very small amount for the Japanese interventions. The interventions was conducted without announcement or an intentional or unintentional leak. Interventions were conducted in 8 days in the second half of January, but all without announcement or confirmation. This was a contrast to the previous regime under Mr. Sakakibara and Mr. Kuroda. Interventions without announcement, later nicknamed as “stealth intervention” became a hallmark of tactics employed by Mr. Mizoguchi.⁵

The yen had appreciated sharply from 125 yen toward the end of December 2002 to 120 yen in the mid-January 2003, so the intervention could have been justified as a “smoothing” operation if an announcement had to be made. Moreover, further yen appreciation, however “smooth” it might be, was considered to be harmful to a fragile economy. The growth rate of year 2002 was expected to be negative, at the time. As

⁴ The first estimate of Japanese GDP statistics is announced a month-and-half later than the end of the quarter. The revised, second estimate is announced more than two months after the end of the quarter. Revisions are often very large.

⁵ See Edison (1993) for a survey on the old literature of interventions, which were more or less negative on the effectiveness. See Sarno and Taylor (2001) for a survey of recent literature on interventions. Dominguez and Frankel (1993), Dominguez (1998, 2003) showed some effectiveness of interventions. See also Galati and Merick (2002) for comparative research on interventions by different countries.

explained in the preceding section, the economy at the beginning of 2003 was still considered to be very weak, the stock prices were declining, and deflation was worsening. Another financial crisis was feared in the spring of 2003—and indeed the Resona Bank was nationalized in May 2003. Both the speed of yen appreciation and the level of the yen were a concern. Sharp appreciation was viewed not to be consistent with macro fundamentals: why should the currency of a very weak economy on the verge of a financial crisis have to appreciate? When the market is taking the currency to the level not consistent with macro fundamentals, wouldn't intervention be a valid policy tool as a signal of displeasure and caution, and the currency appreciation, if possible, should be corrected by interventions. Interventions from January to March can be explained by this logic. Interventions were conducted on and off from January to March 2003, keeping the yen/dollar rate, most of the time, in the tight range between 117 and 120 yen/dollar. The market became aware of interventions, due to the monthly disclosure of the change in the account that is closely linked to intervention. But the market was still left blind about daily details of interventions. As the intervention details (days of interventions and amounts) of the first quarter were announced in May 8, 2003, the public became aware of the switch of intervention policy, to a regime of more frequent interventions. The first intervention since end-March was conducted on May 8, as the yen appreciated beyond 117.

It became clear to market participants in May, that the yen was traded in the narrow range between 117 and 120. Interventions were conducted when the yen/dollar rate approached 116, but when the yen depreciated toward 119, the interventions were withdrawn. This appeared to be a narrow target zone. For example, when the yen was bought to 115.10 (intra-day high in the Tokyo market) on May 19, 2004, heavy interventions, selling of the yen amounting to 1 trillion yen, was conducted and they pushed the yen back to 117 yen/dollar by the end of New York market of that day.

In May the stock prices reverted from the downward trend to the upward trend. The crisis seems to have been averted. Interventions continued, however, as the appreciation pressure continued. Intervention continued in May, June and July, keeping the yen/dollar rate most of the time between 116 and 120. There were 11 intervention days in May, 7 days in June, and 9 days in July.

By September, the intervention was considered to have been a success in the sense that it prevented irrational appreciation that would have pushed the Japanese economy off the recovery path. Stock prices had risen comfortably from the trough in April 2003.

However, from June to September, as the Japanese economic recovery seemed to have become more certain, and the stock prices rose sharply, criticism from abroad became voiced more frequently: Japanese intervention is subsidizing exports, hurting the US manufacturers; Japan with large trade surpluses should not intervene; and by preventing appreciation, the pressure of dollar decline is burdened, unfairly, by the euro.

There was no intervention between July 16 to August 29. From July 16 until August 21, the yen/dollar rate stayed between 118 and 121. From August 21 to 29, the yen rate appreciated in small steps from 118.00 to 117.00. Toward the end of August, the yen started to appreciate. In the process that the yen moved toward 117.00 (intra-day high in Tokyo), interventions were conducted 412 billion yen on August 29.

The intervention was carried out on August 29, when the yen appreciated beyond 117. The first defense line at this point seems to be 117.00.⁶ Once the intervention started, interventions continued on and off, for 11 days (out of 13 business days) between August 29 and September 16. These interventions were partly countering yen appreciation pressure that was built up on the speculation that the United States and Europe increasingly became unhappy with Japanese and other Asian countries interventions, including Chinese dollar peg policy. The yen/dollar rate stayed between 116.00 and 118.00.

Toward the end of August, criticism of intervention had been circulated in the United States and in some European countries. But interventions continued in the first half of September.

On September 11, Secretary Snow was reportedly to have said that Japan must keep intervention minimum. This stimulated speculation to be long on the yen. There was a large intervention on September 12 to keep the yen at 117. The interventions continued until Tuesday, September 16, but no intervention after September 17. The yen (New York close) started to appreciate from 116.10 on September 16, to 115.20 on

⁶ Officials at the Ministry of Finance deny that there was such a defense line, but many market participants believed that orders defending a certain level were placed by the monetary authorities.

September 18, to 114.00 on September 19, without Japanese interventions. The psychological barrier (would-be target zone floor at the time) of 115 yen/dollar was broken.

On September 20, 2003, the G7 Finance Minister and Central Bank Governors Meeting took place in Dubai. At the conclusion of the G7 Meeting, a communiqué with an unusual paragraph was issued. The statement included a paragraph stating the desirability of “flexibility” of the exchange rate:

We reaffirm that exchange rates should reflect economic fundamentals. We continue to monitor exchange markets closely and cooperate as appropriate. In this context, we emphasize that more flexibility in exchange rates is desirable for major countries or economic areas to promote smooth and widespread adjustments in the international financial system, based on market mechanisms.

The market interpreted the paragraph in the communiqué as criticism by the US and European countries of the exchange rate policies of China and Japan—massive interventions and piling up foreign reserves.⁷ The yen appreciated to 112.10 yen/dollar on Monday, September 22—a jump of 2 yen over the G7 weekend.

With the disclosed data of interventions, we now know that interventions did not take place from September 17 to 29—and rumors of no-intervention had it at the time. Many market participants thought that the Japanese authorities were told by other G7 countries not to intervene. The Japanese authorities publicly said that there had been no change in the Japanese exchange rate policy. But still the investors were moving cautiously toward yen appreciation. Only when the yen dollar rate approached 110 yen/dollar rate, the intervention of September 30 was conducted with force (Selling of 1 trillion yen in the day) and prominence (intervening in the New York market as well, according to the market), as if the Japanese authorities wanted to show a license to intervene.

Heavy interventions continued in the fourth quarter of 2003. Despite intervention, the yen/dollar rate rose gradually from 110 to 105. Many market participants thought that

⁷ Japanese officials privately argue that the paragraph of communiqué is directed at China, but not Japan. However, several officials in Europe, when publicly asked, did not deny an interpretation that the paragraph is applicable also to Japan.

the intervention policy may not have been changed, but the defense line was retrieving, first from 115 to 110 at the time of September G7, and then from 110 to 105 by the end of December 2003.⁸

Interventions from January to March 2004 were extremely frequent and heavy again. The Japanese authorities sold about 15 trillion yen during the first three months of 2004. The yen/dollar rate was kept from appreciating beyond 103.

The Japanese authorities intervened on 18 days out of 21 business days in January 2004. (The authorities intervened even on the days when the Japanese financial markets were on holidays—January 2 and 12.) The per-day intervention amount ranged from 2 billion yen on January 26 to 1,664 billion yen on January 9. The size of the January intervention amounted to be 7 trillion yen—a record high for one month. The intervention amount rivals the amount of intervention in the third quarter of 2003.

Another G7 took place on February 7, 2004. The communiqué repeated the same paragraph as the one of September 2003, but nothing beyond. This time, the market participants took it as the endorsement of the Japanese intervention policy between the two meetings by G7.

In February, the Japanese authorities continued heavy intervention, 18 days out of 20 business days, but the amount was less than half of January. In March, the Japanese authorities intervened from March 1 to March 16, every business day but one (March 12). In particular, on March 5, more than 1 trillion yen was sold, and the yen/dollar rate apparently pushed up from 108 yen/dollar to 111 yen/dollar. On March 8, more than 800 billion yen was sold again, to push the rate to 112 yen/dollar (intraday low of the yen in Tokyo). Pushing the dollar up (rather than preventing the dollar from going down (lean-against-the-wind) raised some eyebrows in Japan and the United States.⁹ In retrospect, it can be argued that the monetary authorities tried to push the yen to depreciate to create a room for flexibility above 100 yen before terminating intervention.¹⁰

⁸ Again, no officials even privately confirm such a defense line interpretation.

⁹ Newspaper has noticed the large amount of intervention, and commented that it would be difficult to get out of large interventions. (Asahi Shinbun, March 9, 2004; page 11)

¹⁰ In other words, this interpretation is that the authorities wanted to score an insurance run before finishing the game.

Interventions abruptly ended on March 16, 2004, after intervening 11 days out of 12 business days in the first half of the month. No intervention after March 17 was conducted without any announcement of not doing interventions—the information was again not disclosed until May 12, 2004. The market was guessing whether stealth intervention continued or not in the second half of March and throughout April.¹¹ The yen appreciated up to 103 yen/dollar toward the end of the month, but it changed the direction and started to depreciate, without intervention. The exit was completed.

In April, there was a debate in the policy circle that the monetary authorities may have caused a loss to the Japanese people, by intervening a lot and the yen/dollar rate appreciated beyond the intervention point. At the end of March, unrealized losses from intervention operations in the last fourteen years were estimated to have exceeded 1 trillion yen. The usual rebuttal to this criticism is that in the case of Japanese intervention, the operation is like borrowing at zero interest rate and invest in dollar securities with 1% to 2% coupon rates, the interest income more than compensate the unrealized losses.

The total amount of interventions from January 2003 to March 2004 amounted to 35 trillion yen, or US\$ 320 billion. (From April to July 2004, there has been no interventions since March 16, and the yen fluctuated mostly at around 108-110.)

4. Why so much for so long?

4.1. Fighting against Speculators

In this section, I will try to de-mystify the intervention operations from January 2003 to March 2004. In general, it is considered that interventions occur when the exchange rate changes are large and moving away from the direction that the authorities consider normal. In addition, relationship between macro fundamentals and interventions were closely examined Section 2. In an analysis with macro fundamentals with monthly observations, interventions from January 2003 to September 2003 can be understood as helping economic recovery by preventing sharp yen appreciation. However, this

¹¹ Although the monthly aggregate of April was disclosed at the end of April, with no intervention record, so that the market knew as of the end-April, that intervention did not take place in April, but the market did not know about the details of intervention in the second half of March, until the May 12 disclosure.

explanation may not apply in the fourth quarter of 2003 and the first quarter of 2004, as many macro variables are showing signs of economic recovery.

It appeared to the market and researchers that the “defense line” was retreated from the 116 level before the G7 of September to the 110 level after the G7, since the first intervention after the G7 was carried out on September 30, when the yen became the 110 level (110.48 at 5pm in the Tokyo market). However, this retreat made the speculative forces to be reinforced. Although what is speculative position is difficult to estimate, one of the indicators is the net long position of the currency futures in the Chicago Mercantile Exchange (IMM).

Figure 2 shows the weekly data of net long yen position in IMM and interventions, from January 2003 to June 2004. First, the correlation seems to be clear: when net long positions become large (positive), then intervention tended to occur selling the yen (positive direction). (Note that the units of accounts are different. For IMM, it is unit of transactions at the exchange, while for intervention, it is 100 million yen.) Second, the net long position suddenly became large in August 2003, and continued to be large until mid-February 2004. This corresponds to the period of heavy intervention, except the four weeks from mid-February to mid-March, when intervention continued while net long positions disappeared (in fact, it turned net short position).

Insert [Figure 2](#)

It could be possible to argue that interventions from September 2003 to March 2004 were fighting speculative pressures.

“Smoothing operations” refer to interventions that would make changes slower but not necessarily with an intention to stop the movement or reverse the trend. This may be captured by the variables such as the change of preceding day, $(s_{t-1} - s_{t-2})$, where s_t is the log of yen/dollar rate on day t . Even when the exchange rate moves quickly, if the movement is in the direction that is desirable (from the viewpoint of the monetary authorities), then interventions would not be triggered. In other words, interventions are more likely to occur if the exchange rate are moving away from the long-term equilibrium, whether the long-term equilibrium can be determined by the long-term backward moving average, $(s_{t-1} - s_{t-1}^{MA})$. Since interventions tend to occur in clusters,

the lagged interventions may have some explanatory power. In the end, we have the following specification for the intervention reaction function:

$$Int_t = \phi_1(s_{t-1} - s_{t-2}) + \phi_2(s_{t-1} - s_{t-1}^{MA}) + \phi_3 Int_{t-1} + \phi_4 IMM_t 1(IMM_t > 0) + \phi_5 IMM_t * 1(IMM_t < 0) + v_t$$

where $1(X>0)$ and $1(X<0)$ are indicator functions. This specification allows the asymmetric response of the monetary authorities. Results are shown in Table 3. It shows that the monetary authorities did respond to IMM, but with asymmetric reactions. When the yen long position is large, interventions were conducted to fight it to prevent appreciation, and the yen short position is developed, the monetary authorities also take advantage to push the yen to depreciate. The period from January 2003 to March 2004 is characterized by trying to, but not necessarily being successful, not only prevent appreciation, when adverse conditions arise, but also help depreciation, when opportunities arise.

4.3. Effectiveness

A kind, sympathetic interpretation of the intervention episode of January 2003 to March 2004 is that it helped the economy recover from a depth of recession to a growth path, not in the sense that it actively depreciated the yen but in the sense that it slowed down the pace of yen appreciation. The growth rate increased from negative territory in 2002 to at or above the potential growth rate in 2003-04, and the stock price increased by 50% from April 2003 to April 2004. If helping an economic recovery was an objective, it was certainly achieved the objective.

Another test of evaluating intervention is the tactical effectiveness issue. If slowing down the yen appreciation was the objective, whether intervention did have an impact on the exchange rate on the day of intervention. Ito (2003) proposed a method of evaluating the effectiveness of Japanese intervention. The change in the daily exchange rate is regressed on the change in the past exchange rate (lagged once, and the cumulative change for a week in the past, and deviation from the long-run average) and interventions (Japanese intervention, US intervention, and Japanese first-of-the-week intervention).¹² The specification looks like the following:

¹² See Dominguez and Frankel (1993), Dominguez (2003), Sarno and Taylor (2001) for general references on the effectiveness of interventions. See Truman (2003) for a skeptical view on the effectiveness of interventions.

$$\Delta s(t) = \beta_0 + \beta_1 \Delta s(t-1) + \beta_2 (s(t) - s^T(t-1)) + \beta_3 \text{Int}(t) + \beta_4 \text{IntUS}(t) + \beta_5 \text{IntIN}(t) + \varepsilon(t)$$

where $\Delta s(t) = s(t) - s(t-1)$, $s(t)$ is the NY close of the yen/dollar exchange rate, and s^T is the long-run, here 180 days, backward moving average. The first three terms in the right-hand-side are supposed to capture movement of the yen/dollar rate without interventions. If one strongly believes that the exchange rate follows a random walk, then a condition $\beta_0 = \beta_1 = \beta_2 = 0$, should be imposed. However, in general, a short-run bandwagon effect ($0 < \beta_1 < 1$) and a medium run mean-reversion ($\beta_2 < 0$) may be present, and this specification allows for such behavior. $\text{Int}(t)$ is the Japanese intervention amounts; $\text{IntUS}(t)$ is the US intervention amounts (in the yen). IntIN denotes the first-in-the-week interventions (that is the cross of the indicator function of no intervention in the past five days and $\text{Int}(t)$): $\text{IntIN}(t) = \text{Int}(t)$ if $\text{Int}(t) \neq 0$ and $\text{Int}(t-1) = \text{Int}(t-2) = \dots = \text{Int}(t-5) = 0$, or, otherwise, $\text{IntIN}(t) = 0$. This term is to capture the power of infrequent, “surprise” interventions, as opposed to continuous interventions. Interventions are often done in clusters. Namely, one intervention tends to be followed by others. This can be explained by the fact that political costs for interventions (obtaining an approval and forming consensus carries bureaucratic costs) can be lowered once intervention is done. (See Ito and Yabu (2004) for specifying seriously this line of thoughts.)

The equation is now estimated for the three subperiods (pre-Sakakibara, Sakakibara-Kuroda, and Mizoguchi).¹³ The results are shown in [Table 4](#).

[Insert Table 4.](#)

Interventions were effective in that the yen-selling interventions depreciated the yen, and the yen-buying interventions appreciated the yen in the second and third subperiods. Effectiveness of the interventions (β_3) was halved in period 3 compared to period 2:

¹³ I am grateful to Mr. Tomoyoshi Yabu for his excellent research assistantship.

One-trillion yen interventions depreciated only 0.7% in the second period and 0.38% in the third period. Moreover, one trillion yen first-time-in-a-week intervention (effects of $\beta_3 + \beta_5$) depreciated the yen by 2.1 percent in the second sub-period (1995-2003), while it depreciated the yen only by 0.45% in the third period (2003-2004). In sum, the interventions were effective in the Mizoguchi stealth interventions but the degree of impact declined to the level of 1/2 in general, and 1/5 in first-time-in-a-week interventions.

Taking these estimates and multiply by 35 (the amount of intervention in the 15 months), we have an estimate of 13% depreciation (from the level otherwise). (Assuming 0.38% of depreciation per 1 trillion yen, $35 \times 0.38 = 13.3\%$ depreciation.) In other words, by selling 35 trillion yen, the Japanese authorities achieved the range from 105 to 115 in the spring-summer of 2004, rather than 90 to 100.

We can think of several reasons for the decline in the effectiveness in the third period, compared to the second period. First, stealth intervention may be a worse tactics. If signaling was to be given, then announcement of the fact that interventions are carried should amplify the effect. The weight of intervention in the total turnovers every day is very small even with a large intervention. So, any effect has to be working on the expectation of the market participants. Intervention cannot be very much effective if the fact of interventions is deliberately kept confidential. Second, too frequent interventions may reduce the effectiveness of intervention. Surprise intervention is highly effective by sending new information to the market. However, continuous interventions do not convey any information to the market. Third, the market detected disagreement—whether true or false—between the Japanese and other G7 authorities over the desirability of the Japanese interventions. This was most highlighted in August-September 2003. The fact that speculative positions were built up so much in late August 2003 was the result of this. In a sense, the Japanese authorities kept intervening from September 2003 to March 2004 to reverse expectations of speculators (broadly defined). In the meantime, more interventions did not move the rate. The fact that interventions stopped soon after net long positions disappeared in Chicago attest this interpretation. Fourth, suppose that the Japanese authorities were defending a particular rate, which they deny. Then the success means that the rate does not move. The fact that econometric results shows no effect on the exchange rate when interventions were carried out is not a sign of ineffectiveness but a sign of effectiveness.

In the sense, the regression is mis-specified, if the objective was to defend the line but not to rebound.

4.3. Cost of Intervention

Usually, large-scale interventions to sell the domestic currencies, and building up large foreign reserves, are considered to be too costly, although there is no limit for this operation as opposed to buying the domestic currencies, depleting foreign reserves. Costs of intervention may come from interest payments on the borrowed domestic currency (in case of issuing government bills or central bank bills) or from higher inflation rate (in case of printing money). However, Japanese interventions were not costly on either front.

In order to fight deflation, the Bank of Japan has adopted the zero interest rate policy.¹⁴ Funding for 35 trillion yen operations were virtually at no borrowing costs, while investing in the U.S. papers carried 2 to 3 % interest rates depending on the maturities. Therefore, the more foreign reserves, the more net interest income.¹⁵

When deflation is a problem, a little bit of inflationary pressure resulting from unsterilized intervention is no harm. In fact, Svensson (2001) advocated unsterilized, unlimited intervention as a fool-proof way of getting out of intervention in Japan. Since the institutional framework for intervention in Japan—issuing fiscal bills to obtain yen cash and intervene to purchase foreign securities—guarantees the automatic sterilization, the Bank of Japan have to expand monetary base in tandem of interventions if unsterilized intervention have to be pursued. Although there was no explicit cooperation for unsterilized intervention from the Bank of Japan, the monetary base was expanded in 2003, unlike the earlier episode. This was implemented by the increase in the target of the current account at the Bank of Japan, that is, effectively excess reserves.¹⁶ For the first half of 2003, there were some similarities in the increase in the cumulative intervention and cumulative increase in monetary base, as shown in Figure 3. However, this was probably no more than coincidence.

¹⁴ See Ito and Mishkin (2004) on this appraisal of the Japanese monetary policy in the last twenty years.

¹⁵ This positive spread has been the case since 1992. The cumulative interest income from positions built by interventions from 1991 to 2002 are estimated to be around 4 trillion yen, see Ito (2003).

¹⁶ See Ito (2004b) for the political economy of the relationship between the Bank of Japan and the Ministry of Finance.

Insert Figure 3

The point is that interventions themselves are no cost or constraint to monetary policy in the deflationary environment in 2003, whether or not the Bank of Japan was willing to expand monetary base.

5. Concluding Remarks

This paper reviewed the experiences of Japanese macroeconomic development and intervention from 2001 to 2004, with an emphasis on the experience from January 2003 to March 2004. The regime changed in January 2003 from infrequent, large-scale intervention to infrequent, large scale interventions. The regime change coincided with the change in the personnel in charge of intervention. Japanese Interventions tended to occur when there is sharp appreciation of the yen, when macro fundamentals are weak, and when speculative positions were built up in 2003 and 2004.

Since the economy got back to a growth track in 2004, interventions to prevent premature yen appreciation can be regarded as a success. Looking into more tactical issues, the effectiveness of interventions was much less in this episode of interventions. However, costs of large scale interventions was small in the environment of slow growth, zero interest rate, and deflation.

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Figure 1: Growth Rates of the Japanese Economy, 1973 – 2003

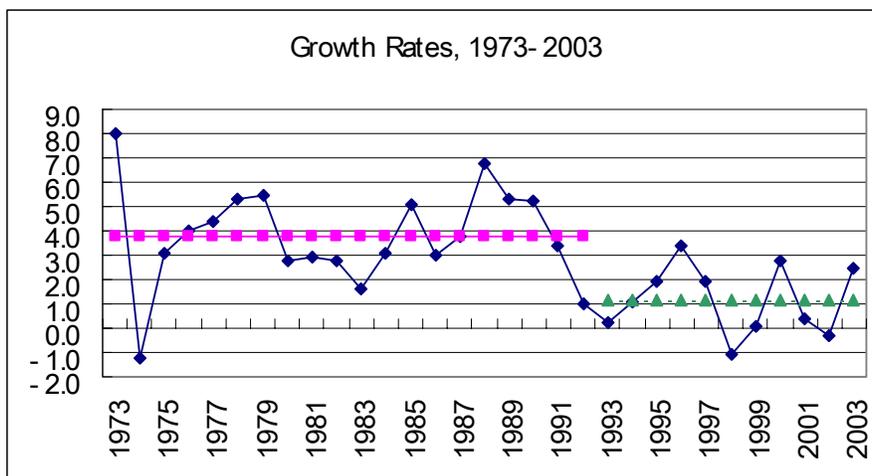


Figure 2: Futures Position and Intervention

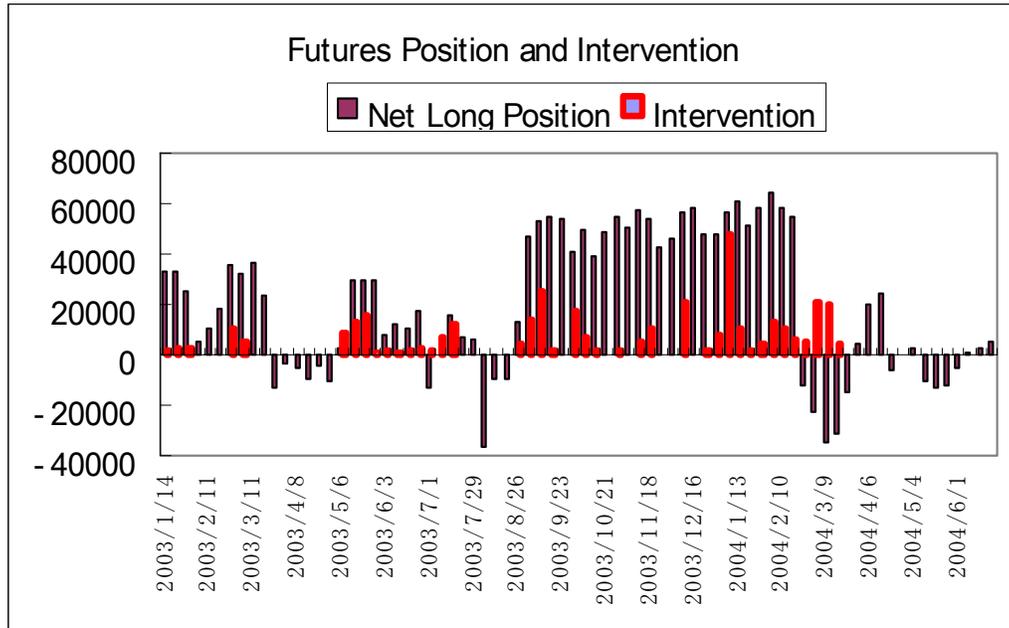


Figure 3: Unsterilized intervention

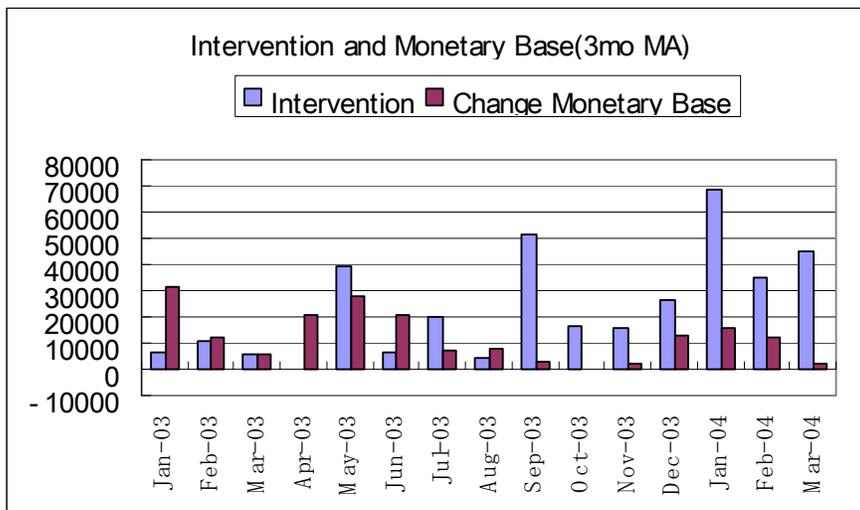


Table 1: Views of the Bank of Japan on the economy

2001	Bank of Japan, Monthly Reports, Opening Paragraph	BOJ view
Jan	Japan's economy continues to recover gradually, but the pace is slowing due to decelerating export growth.	+0.5
Feb	Japan's economy continues to recover gradually, but the pace is slowing due to decelerating export growth.	+0.5
Mar	The recovery in Japan's economy has recently come to a pause, reflecting a decrease in exports.	0.0
Apr	Adjustments in economic activities have been under way, as production is declining reflecting a fall in exports.	-0.5
May	Adjustments in economic activities have been under way, as production is declining reflecting a fall in exports.	-0.5
Jun	Adjustments in economic activities are gradually intensifying, as production is declining substantially reflecting a fall in exports.	-1.0
July	Adjustments in economic activities are intensifying, as production is declining substantially reflecting a fall in exports.	-1.0
Aug	Adjustments in economic activities are intensifying further, reflecting a substantial decline in exports and production.	-1.0
Sept	Adjustments in economic activity are becoming more severe, as the substantial decline in production, starting from a fall in exports, is beginning to have a negative influence on employment and income conditions.	-1.5
Oct	Adjustments in economic activity are becoming more severe, as the substantial decline in production has a negative influence on employment and income conditions. In addition, the terrorist attacks in the U.S. have further heightened uncertainty in Japan's economy.	-1.5
Nov	Adjustments in economic activity are becoming more severe, as the substantial decline in production is beginning to have an adverse effect on private consumption through decreases in employment and income.	-1.5
Dec	Japan's economy is deteriorating broadly, as private consumption is weakening in addition to a decline in exports and business fixed investment.	-2.0

2002		BOJ view
Jan	Japan's economy is deteriorating broadly, as private consumption is weakening in addition to a decline in exports and business fixed investment.	-2.0
Feb	Japan's economy continues to deteriorate.	-2.0
Mar	Japan's economy still continues to deteriorate as a whole, although the downward pressure from exports and inventories is gradually abating.	-1.5
Apr	Japan's economy still continues to deteriorate as a whole, but the pace has moderated somewhat.	-1.0
May	The pace of deterioration in Japan's economy has moderated, with production starting to pick up reflecting the increase in exports and progress in inventory adjustment.	-1.0
Jun	Japan's economy shows signs of stabilizing with a distinct increase in exports and a pick-up in production, although domestic private demand remains weak.	-0.5
July	Japan's economy, despite continued weakness in domestic demand, has almost stabilized as a whole with an increasing upward impetus from exports and production, and an improvement in corporate profits and business sentiment.	0.0
Aug	Japan's economy, despite persistent weakness in domestic demand and increasing uncertainty regarding the global economy, has almost stabilized as a whole with exports and production continuing to increase.	0.0
Sept	Japan's economy, despite persistent weakness in domestic demand and large uncertainty regarding the global economy, has almost stabilized as a whole with exports and production continuing to increase.	0.0
Oct	Japan's economy has stabilized as a whole, but clear signs of recovery have not yet been observed partly due to large uncertainty regarding the global economy.	0.0
Nov	Japan's economy has stabilized as a whole, but there is greater uncertainty toward recovery.	0.0
Dec	Japan's economy has stabilized as a whole, but there is still substantial uncertainty toward recovery.	0.0

2003		BoJ view
Jan	Japan's economy has stabilized as a whole, but there is still substantial uncertainty about the prospects for a recovery.	0.0
Feb	Economic activity remains flat amid substantial uncertainty about the outlook for the economy.	0.0
Mar	Economic activity remains flat amid substantial uncertainty about the outlook for the economy.	0.0
Apr	Economic activity remains flat as a whole, despite some signs of improvement, with greater uncertainty about the economic outlook partly due to Iraq-related developments.	0.0
May	Economic activity remains flat as a whole, but there is greater uncertainty about the economic outlook.	0.0
Jun	Economic activity remains virtually flat as a whole, although exports are currently showing some weakness.	0.0
July	Economic activity remains virtually flat.	0.0
Aug	Economic activity remains virtually flat.	0.0
Sept	Economic activity still continues to be virtually flat as a whole, although signs of improvement have been observed in such areas as the environment for exports.	0.0
Oct	The foundation for a gradual recovery in Japan's economy is being laid, as the environment for exports and business sentiment have improved.	0.5
Nov	Japan's economy is starting to recover gradually.	0.5
Dec	Japan's economy is recovering gradually.	0.5

2004		BoJ view
Jan	Japan's economy is recovering gradually.	0.5
Feb	Japan's economy is recovering gradually.	0.5
Mar	Japan's economy is recovering gradually.	0.5
Apr	Japan's economy continues to recover gradually, and domestic demand is becoming firmer.	0.5
May	Japan's economy continues to recover gradually, and domestic demand is becoming firmer.	0.5
Jun	Japan's economy continues to recover, and the increases in production and corporate profits are exerting positive effects on employment.	1.0

BoJ view of the direction of the economy: Author's interpretation of Bank of Japan opening statements of the monthly report, on the direction of the economy, from -2.0 to +2.0. The original monthly reports are available from the Bank of Japan homepage: http://www.boj.or.jp/en/seisaku/0*/seisak_f.htm, where t=1,2,3,4.

Table 2: Macro Fundamentals

	Stock prices eom	Chg Stock p	Yen/\$ rate eom	yen chg	BOJ view	Growth rate	Core inflatio	Intervention	Chg M base
2001Ja	13,843.55	0.4	116.38	1.3	0.5		-0.8	0	1692
Feb	12,883.54	-6.9	116.44	0.1	0.5		-0.8	0	-33414
Mar	12,999.70	0.9	125.27	7.6	0.0	1.4	-0.9	0	9495
Apr	13,934.32	7.2	124.06	-1.0	-0.5		-0.8	0	10364
May	13,262.14	-4.8	119.06	-4.0	-0.5		-1.0	0	1929
Jun	12,969.05	-2.2	124.27	4.4	-1.0	-4.4	-0.9	0	85
July	11,860.77	-8.5	124.79	0.4	-1.0		-0.9	0	18087
Aug	10,713.51	-9.7	118.92	-4.7	-1.0		-0.9	0	-5095
Sept	9,774.68	-8.8	119.29	0.3	-1.5	-3.2	-0.8	-31455	23625
Oct	10,366.34	6.1	121.84	2.1	-1.5		-0.7	0	11146
Nov	10,697.44	3.2	123.98	1.8	-1.5		-0.8	0	16276
Dec	10,542.62	-1.4	131.47	6.0	-2.0	-2.7	-0.9	0	60646
2002Ja	9,997.80	-5.2	132.94	1.1	-2.0		-0.8	0	46394
Feb	10,587.83	5.9	133.89	0.7	-2.0		-0.8	0	-14655
Mar	11,024.94	4.1	132.71	-0.9	-1.5	-2.4	-0.7	0	45330
Apr	11,492.54	4.2	127.97	-3.6	-1.0		-0.9	0	38900
May	11,763.70	2.4	123.96	-3.1	-1.0		-0.8	-21174	-42164
Jun	10,621.84	-9.7	119.22	-3.8	-0.5	5.1	-0.8	-18750	-13897
July	9,877.94	-7.0	119.82	0.5	0.0		-0.8	0	6474
Aug	9,619.30	-2.6	117.97	-1.5	0.0		-0.9	0	75
Sept	9,383.29	-2.5	121.79	3.2	0.0	4.1	-0.9	0	-3412
Oct	8,640.48	-7.9	122.48	0.6	0.0		-0.9	0	1830
Nov	9,215.56	6.7	122.44	-0.0	0.0		-0.8	0	34701
Dec	8,578.95	-6.9	119.37	-2.5	0.0	0.7	-0.7	0	55444
2003Ja	8,339.94	-2.8	119.21	-0.1	0.0		-0.8	-6781	4224
Feb	8,363.04	0.3	117.75	-1.2	0.0		-0.7	-10614	-23394
Mar	7,972.71	-4.7	119.02	1.1	0.0	-0.1	-0.6	-5518	36185
Apr	7,831.42	-1.8	119.46	0.4	0.0		-0.4	0	48986
May	8,424.51	7.6	118.63	-0.7	0.0		-0.4	-38997	-1898
Jun	9,083.11	7.8	119.82	1.0	0.0	4.3	-0.4	-6289	14085
July	9,563.21	5.3	120.11	0.2	0.0		-0.2	-20271	8731
Aug	10,343.55	8.2	117.13	-2.5	0.0		-0.1	-4124	1085
Sept	10,219.05	-1.2	110.48	-5.7	0.0	2.2	-0.1	-51116	-1116
Oct	10,559.59	3.3	108.99	-1.3	0.5		0.1	-16687	-321
Nov	10,100.57	-4.3	109.34	0.3	0.5		-0.1	-15872	7351
Dec	10,676.64	5.7	106.97	-2.2	0.5	7.6	0.0	-26196	31629
2004Ja	10,783.61	1.0	105.88	-1.0	0.5		-0.1	-68215	8329
Feb	11,041.92	2.4	109.08	3.0	0.5		0.0	-34766	-2750
Mar	11,715.39	6.1	103.95	-4.7	0.5	6.4	-0.1	-45332	668
Apr	11,761.79	0.4	110.44	6.2	0.5		-0.2	0	1720
May	11,236.37	-4.5	109.56	-0.8	0.5		-0.3	0	5370
Jun	11,858.87	5.5	108.69	-0.8	1.0	1.3	-0.1	0	-15371

Notes and Sources:

BoJ view: Author's interpretation of Bank of Japan opening statements of the monthly report, on the direction of the economy, from -2.0 to +2.0. The original monthly reports are available from the Bank of Japan homepage: http://www.boj.or.jp/en/seisaku/0*/seisak_f.htm, where $t=1,2,3,4$.

Stock: The percentage change in the Nikkei stock price index from the end of month $t-1$ to the end of month t . The level is available from the Bank of Japan homepage: http://www.boj.or.jp/stat/dlong_f.htm

Yen: The percentage change in the yen/dollar rate from the end of month $t-1$ to the end of month t . Negative numbers imply yen appreciation. The level is available from the Bank of Japan homepage: http://www.boj.or.jp/stat/dlong_f.htm

Intervention: The aggregated amounts of yen/dollar intervention in the month, excluding the yen/euro interventions. Negative numbers imply yen-selling, dollar-purchasing interventions. The original data are available at the Ministry of Finance homepage:

<http://www.mof.go.jp/english/e1c021.htm>

GDP: The real GDP growth rate, annualized rates of quarter to quarter changes. The quarterly GDP is seasonally adjusted.

The GDP statistics are available from Cabinet Office: <http://www.esri.cao.go.jp/en/sna/menu.html>

Inflation: The percentage change in the CPI excluding fresh food. CPI is available from Statistics Bureau, Ministry of Internal Affairs and Communication: <http://www.stat.go.jp/data/cpi/1.htm>

Table 3: Net long futures in the Intervention Reaction Function

OLS (2003/1/1-2004/3/16)

$$Int_t = \phi_1(s_{t-1} - s_{t-2}) + \phi_2(s_{t-1} - s_{t-1}^{MA}) + \phi_3 Int_{t-1} + \phi_4 IMM_t 1(IMM_t > 0) + \phi_5 IMM_t * 1(IMM_t < 0) + v_t$$

	Tuesday	Friday
ϕ_1	132850 (65960)*	179787 (70423)**
ϕ_2	-28787 (28878)	2759 (49778)
ϕ_3	0.21 (0.09)*	0.15 (0.10)
ϕ_4	-0.16 (0.04)**	-0.12 (0.07)†
ϕ_5	0.34 (0.19)†	0.37 (0.20)†
R2 Bar	0.239	0.135
OBS	64	63

注) Heteroskedasticity-and-autocorrelation-consistent (HAC) standard errors are give in parentheses.

†Statistically significant at the 10-percent level.

*Statistically significant at the 5-percent level.

**Statistically significant at the 1-percent level

Table 4: Effectiveness

	April 1, 1991 – June 20, 1995	June 21, 1995 – January 13, 2003	January 14, 2003 – March 31, 2004
$\beta 0$	-0.0008 (0.0002)**	0.0001 (0.0002)	-0.001 (0.0005)*
$\beta 1$	-0.028 (0.031)	-0.0022 (0.026)	-0.033 (0.053)
$\beta 2$	-0.0158 (0.0053)**	0.0019 (0.002)	-0.0038 (0.0089)
$\beta 3$	0.0000047 (0.0000008)**	-0.0000007 (0.0000002)**	-0.00000038 (0.00000016)*
$\beta 4$	-0.000012 (0.000005)**	-0.000054 (0.000008)**	Na
$\beta 5$	0.0000008 (0.0000057)	-0.0000014 (0.0000005)**	-0.00000007 (0.0000003)
R2	0.0031	0.0068	0.0037
# Obs	1101	1962	308
Estimated with a Garch model. ** statistically significant at the 1-percent level. * statistically significant at the 5-percent level. # statistically significant at 10-percent level.			

Notes: see Ito (2003) for the details of the first two periods, and see Ito (2004) for the third period.