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## Japan's Open Market Operations under the Quantitative Easing Policy

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## **Japan's Open Market Operations under the Quantitative Easing Policy\***

Eiji Maeda, Bunya Fujiwara, Aiko Mineshima, and Ken Taniguchi

### **1. Introduction**

The Bank of Japan (hereinafter referred to as the Bank) determined to undertake the so-called “quantitative easing policy” in March 2001, in which current account balances at the Bank were adopted as the Bank’s main operating target. Since the start of the quantitative easing policy, the Bank has raised the target level of current account balances several times. As the target level has far exceeded the level of required reserves, the adoption of the quantitative easing policy means that the Bank has had to provide additional funds to financial institutions that do not have incentives to hold a large amount of excess reserves. Such a policy has been unprecedented for any central bank. Thus, the achievement of the target has been a great challenge to the Bank. Under this policy, the Bank has taken various measures to achieve the target, facing occasional difficulties. Therefore, it would serve as a useful reference for other central banks, market participants, and academics to review the Bank’s experiences of monetary policy implementation.

In this paper, as staff of the Open Market Operations Desk, we focus on the technical aspects of open market operations from the viewpoint of a practitioner rather than on the academic aspects, such as the effects of the quantitative easing policy on economic activities and prices. Before discussing our experiences with open market operations aimed at achieving the target under the quantitative easing policy in section 4, we will briefly explain the outline of the policy in section 2 and the basic characteristics of open market operations in Japan in section 3.

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## **2. Outline of the Quantitative Easing Policy**

### **2-1. Pillars of the quantitative easing policy**

In March 2001, the Bank changed the main operating target for its open market operations from the uncollateralized overnight (O/N) rate in the call market to the current account balances (hereinafter referred to as CABs) at the Bank<sup>1</sup>, which can be defined as reserve targeting. This policy change has been called the introduction of the “quantitative easing policy” (hereinafter referred to as QEP). QEP has consisted of the following three pillars.

- (1) Maintaining ample supply of liquidity by using CABs at the Bank as the operating target.
- (2) Commitment to maintaining ample supply of liquidity until the year-on-year increase in the core consumer price index (CPI) becomes positive on a sustained basis.
- (3) Increasing the amount of outright purchases of long-term Japanese government bonds (JGBs) if necessary for providing liquidity smoothly.

Behind the introduction of QEP was the Bank’s judgment that Japan’s economy faced the growing threat of a deflationary spiral. In light of this, the Bank decided to take policy actions to ease monetary conditions beyond what would be undertaken under ordinary circumstances.

### **2-2. Effects of QEP on the money markets**

At the start of QEP, the target level of CABs was around 5 trillion yen, which was a little larger than the required reserve level of around 4 trillion yen. Since then, the Bank has increased the target level several times, which is currently set at a range of 30–35 trillion yen, while the level of required reserves is around 6 trillion yen. Although the uncollateralized O/N call rate floated for a while after the introduction of QEP, it drifted down close to zero percent after the target level was raised above 6 trillion yen (chart 1). Rates on term instruments, such as three-month government financing bills (FBs) and six-month and one-year treasury bills (TBs), declined to

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<sup>1</sup> The call market is an inter-bank money market in Japan.

nearly zero and rates on medium-term JGBs, such as two-year and five-year bonds, declined significantly (chart 2).

An interesting phenomenon seen under QEP is trading at negative interest rates in the call market (chart 3). Such trades were first observed at the beginning of 2003 and have been occasionally observed thereafter. As a result, the weighted average of the uncollateralized O/N call rate fell below zero percent for the first time in June 2003 and marked the lowest level of minus 0.012 percent on January 14, 2004.

Trading at negative interest rates in the call market reflects negative “yen funding costs” in the currency swap market,<sup>2</sup> which is caused by the following.

- (1) Japanese banks have become able to raise yen funds at nearly zero percent without the risk premium under QEP, since the Bank has provided ample excess liquidity through open market operations.
- (2) Under such an environment, the creditstanding differential in favor of foreign banks enables them to raise yen funds at negative costs in the currency swap market. As Japanese banks with lower creditstandings find it difficult to raise the U.S. dollar funds without collateral in the cash market, they raise the U.S. dollar in exchange for the yen as collateral in the currency swap market. These foreign banks with higher creditstandings require Japanese banks to pay a premium for counterparty risk to raise the U.S. dollar funds. Consequently, foreign banks can raise the yen with better conditions of negative costs.
- (3) In addition, as the excess of yen funds has grown stronger, a tighter, albeit temporary, demand for dollar funds in the U.S. money market and consequently in the currency swap market has a tendency to make negative yen funding costs larger.

The first and second can be considered to be underlying factors. The third factor also seems to be important to explain the large negative costs often observed. Since the middle of 2003, the creditstanding of Japanese banks has been steadily improving. This might have caused the fundamental factors to recede. Still, large negative costs have been regularly observed at the end of each quarter when liquidity conditions in the U.S. money market become tight, probably reflecting the third factor.

As a result of funding at negative costs, foreign banks have accumulated large amounts of CABs whose interest rate is zero, thus benefiting from profit opportunities

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<sup>2</sup> Currency swap transactions are the exchange of two currencies for a certain period of time. “Yen funding costs” in the currency swap market are costs of raising yen funds by exchanging the U.S. dollar for the yen for a certain period of time.

(chart 4). However, some foreign banks are setting an upper limit on their holdings of sovereign debts (governments, central banks, and others). In these cases, yen funds raised at negative costs through currency swap transactions by such foreign banks are extended to other financial institutions through the call market at negative interest rates with a certain interest margin, within the limit of individual credit lines.

### **3. Basic Characteristics of Open Market Operations in Japan**

Before discussing open market operations under the framework of QEP, we will briefly review the basic characteristics of open market operations in Japan.

#### **3-1. Operational framework to achieve the target**

The Bank operates under a reserve requirement system. Under this system, the Bank has endeavored to achieve its operating target, which was set to be the uncollateralized O/N call rate before March 2001 and CABs thereafter. CABs do not bear interest in Japan. Hence, financial institutions pay a higher opportunity cost by holding CABs when market rates are higher.

The main operating procedure used to achieve the target is open market operations. The Bank introduced the Complementary Lending Facility shortly before adopting QEP in March 2001. This is a “Lombard-type” standby lending facility through which the Bank extends loans at the requests of counterparties at the official discount rate.<sup>3</sup> Therefore, the official discount rate, which is currently set at 0.10 percent, would cap upward movements of the O/N call rate. On the other hand, the Bank does not have any deposit facility which would mark the lower bound for the O/N call rate.

#### **3-2. Large fluctuations of autonomous factors**

The Bank conducts its market operations to maintain a certain level of CABs in response to changes in autonomous factors affecting the level of CABs, which mainly

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<sup>3</sup> Complementary lending is collateralized by the pooled collateral submitted to the Bank. See footnote 4 for the pooled collateral system.

consist of banknotes and treasury funds. Under O/N rate targeting, the Bank endeavors to maintain CABs at around the level of required reserves, while it maintains CABs in the target range under QEP. In Japan, fluctuations of autonomous factors are considerably larger than fluctuations in the Euro area and the United States (charts 5, 6). This is mainly because treasury funds paid and received by the national government are settled solely through its account at the Bank.

Large fluctuations of autonomous factors are the key features that can cause an operational burden for the Bank in smoothly achieving the target. Firstly, the Bank has to conduct operations very frequently to maintain the level of CABs by responding to the daily large fluctuations of autonomous factors. In 2003, the Bank conducted operations 470 times, including 150 funds-absorbing operations. Secondly, under QEP, since the average outstanding balances of funds-supplying operations are high, the Bank occasionally has to build up additional large balances of funds-supplying operations over a short period of time to maintain the target level responding to a large shortage of treasury funds (chart 7). The periodical accumulation of operations occurs every quarter when corporate taxes are collected from the private sector. In such cases, bids in each funds-supplying operation tend to decrease. This is because counterparties bid in funds-supplying operations based on several motives rather than only to hold CABs to meet immediate reserve requirements and settlement needs, and those motives tend to recede as scarcity of operations decreases. Details will be discussed in section 4.

### **3-3. Wide variety of operational tools and counterparties**

Faced with such large fluctuations of autonomous factors, the Bank has equipped itself with a wide variety of operational tools, including several funds-absorbing operations, in order to control the level of CABs (charts 8, 9). As to funds-supplying operations, the Bank has several operations whose maturities are within one year and an outright purchasing operation of JGBs whose full maturities are more than one year. The Bank's Operations Desk calls the former "short-term" (temporary) operations and the latter a "long-term" (permanent) operation.

Short-term operations consist of outright and repurchase agreement type operations. Among these, the outright purchases of bills involve the purchases of bills

issued by counterparties collateralized by pooled collateral submitted to the Bank.<sup>4</sup> The function of this operation is a collateralized fund provision or a repurchase agreement-like transaction to provide funds for a certain period. This operation serves as a main tool and its outstanding balance is the largest among short-term operations. Other funds-supplying operations, such as outright purchases of TBs/FBs and purchases of commercial paper (CP) with repurchase agreements, have a tendency to directly influence supply and demand conditions in each market.

The use of a broad range of operational tools, including funds-absorbing operations, makes it easier to smooth out short-term fluctuations of autonomous factors. At the same time, high target levels of CABs can be achieved more smoothly with the use of diverse funds-supplying measures. If the flow of funds were very smooth across the markets, it would be unnecessary to have a variety of operational tools. However, some market segments may turn illiquid due to several factors, such as market practices and transaction costs. This is especially true when interest rates are close to zero under QEP. Thus, employing a variety of operational tools is an effective means to achieve the target.

The number of counterparties in open market operations is now close to 150 (chart 10).<sup>5</sup> They include not only domestically licensed banks, but also foreign banks and securities companies. The purpose of having a wide variety of counterparties is to enhance smooth conduct of operations and also to provide a large number of market players with equal access to the Bank's operations. With a view to enhancing transparency, the Bank has published its criteria for counterparty eligibility since 1998.<sup>6</sup>

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<sup>4</sup> The pooled collateral system was introduced at the beginning of 2001 in order to make operations more convenient for counterparties. Under this system, not only public debts, such as JGBs, but also private debts, such as CP and bank loans, are eligible as collateral. The pooled collateral now covers open market operations (purchases of bills), complementary lending, intra-day overdrafts, and exposures stemming from treasury agency business.

<sup>5</sup> To hold a current account at the Bank is one of the prerequisites for a financial institution to become a counterparty in the Bank's open market operations as described below. The number of financial institutions who have current accounts at the Bank was 607 as of March 2004.

<sup>6</sup> Major criteria to become counterparties are the following: (1) to hold current accounts at the Bank, (2) to be of adequate creditworthiness, (3) to be online participants in the Bank of Japan Financial Network System (BOJ-NET), (4) to bid in operations actively, (5) to process transactions promptly and accurately, and (6) to provide information useful in formulating and implementing monetary policy.

#### **4. Conduct of Open Market Operations in order to Achieve the Target of CABs**

Under QEP, the target level of CABs has far exceeded the level of required reserves that must be held by financial institutions at the Bank. The recent average of financial institutions' "excess reserves," defined as the amount exceeding the required reserves of around 6 trillion yen, is around 25 trillion yen for the reserve maintenance period. This amounts to around 5 percent as a ratio to nominal GDP.

Under these circumstances, the Bank has occasionally faced undersubscription in its funds-supplying operations, but the target has been achieved (chart 11). This indicates that there has been a fair amount of demand for funds-supplying operations among counterparties. In this section, to examine the relevant background, we will first discuss the bidding incentives for counterparties holding excess reserves. Then we will explain the Bank's measures on operational tools to stimulate such incentives and the daily efforts by the Operations Desk. Related to this issue, we will also take up a topic often discussed: the impact of foreign exchange intervention on CABs at the Bank.

##### **4-1. Bidding incentives for counterparties**

Counterparties' demand for funds-supplying operations is based on several motives. Even if they have already accumulated sufficient CABs for immediate reserve requirements and settlement needs, they still have incentives to bid in operations.

The first motive is to secure liquidity which will be necessary in the distant future. Counterparties that have already satisfied their immediate liquidity needs may bid in funds-supplying operations with longer maturity in order to secure future liquidity in advance. In this regard, counterparties generally tend to bid in the operations more actively when there is greater uncertainty regarding raising the necessary amount of liquidity. This situation can arise in the face of (1) growing concern over financial system stability or (2) the weakened function of the money markets. As to the former situation, the Bank has expanded the supply of liquidity, including the raising of the target level of CABs, whenever it has found any serious signs of financial market instability. As to the latter situation, it may be pointed out that QEP itself has led to sluggish trading and thus the weakening of the intermediation function in the money market (chart 12). Under QEP, lenders' incentive for transactions has declined because the call rate has remained very close to zero, making it difficult to cover transaction



costs with interest margins. From the perspective of borrowers, the need to raise funds in the money market has declined mainly because the funds-supplying operations of the Bank have offered the primary means of financing.

The second motive is to secure profits or prevent further losses, and to control interest rate risk. In the Bank's TB/FB and JGB outright purchasing operations, counterparties can secure profits or prevent further losses by selling these instruments to the Bank. As to CP purchasing operations with repurchase agreements, CP dealers regard them as convenient tools for raising funds for the purchases of CP in the market and to fix margins. In the case of outright purchases of bills and purchases of Japanese government securities (JGSs) with repurchase agreements, counterparties can earn margins if funds raised through these operations are invested in assets of similar maturity with higher yields. A successful bid also allows a counterparty to make a fixed-rate payment and thereby hedge interest rate risk. The same effects can be obtained from market transactions, such as sales of JGSs in the spot or futures market, build-up of short positions in interest rate swaps, and raising of funds through transactions using term instruments. However, because successful bidding in the Bank's operations has a smaller impact on market prices and interest rates, counterparties may prefer to bid in the operations under certain circumstances. This tendency becomes stronger in the following cases.

- (1) When a relatively large amount of securities is to be sold or that of funds is to be raised, compared with market liquidity.
- (2) When the maturity of operations is long enough for counterparties to obtain benefits.
- (3) When financial markets are volatile.

As just discussed, counterparties regard the Bank's operations as financial transactions for a wide variety of purposes rather than a means merely for accumulating their CABs for immediate reserve requirements and settlement needs.<sup>7</sup> In general, operations with longer maturity are more useful for counterparties in order to fix future liquidity, secure profits, and control their interest rate risks. Consequently,

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<sup>7</sup> Other than the incentives mentioned here, counterparties may have an incentive from the perspective of developing and maintaining a long-term relationship with the Bank. Financial institutions may regard the Bank as an important correspondent for financial transactions and find advantages in becoming counterparties for market operations. One of the Bank's requirements for counterparties in market operations is to bid actively as described in footnote 6.

CABs at the Bank increase and financial institutions hold excess reserves. Since current account deposits at the Bank do not bear interest, financial institutions would make every effort to avoid holding excess reserves at the Bank if money market rates (one of the opportunity costs) were clearly positive. Under QEP, money market rates have been almost zero. Therefore, financial institutions do not seem to be very reluctant to hold excess reserves, as long as actual reserves are within their rough upper limits. Such limits seem to be influenced not only by money market rates but also by other factors such as conditions of financial system stability and financial institutions' awareness of the expansion of their balance sheet.

#### **4-2. Measures on operational tools to stimulate bidding from counterparties**

On the side of conducting operations, the Bank has taken measures on operational tools to stimulate counterparties' demand for funds-supplying operations, taking their bidding incentives mentioned above into account.

##### **Increase in the amount of outright purchases of long-term JGBs**

One of the effective measures has been to increase the amount of outright purchases of long-term JGBs (chart 13). When short-term interest rates are close to zero, bids in short-term funds-supplying operations tend to decrease since profits secured by successful bids in operations are very limited. Under such circumstances, relatively steady demand can be expected for long-term JGB purchasing operations. This is because the maturity of operations is long and it is unlikely that such operations face a zero interest rate constraint. Additionally, financial institutions seeking to sell a large amount of securities tend to prefer JGB purchasing operations of the Bank to market transactions, as market liquidity of some issues is low. In fact, counterparties tend to sell JGBs with shorter remaining maturity that are less liquid in the market (chart 14).<sup>8</sup>

When the Bank introduced QEP, the amount of long-term JGB purchases was 0.4 trillion yen per month. The amount was raised several times, reaching 1.2 trillion yen per month in November 2002 and thereafter. Looking at the Bank's balance sheet, it can be easily seen that the increase in long-term JGBs is larger than the increase in

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<sup>8</sup> Each operation covers all the maturities of JGBs except for 30-year bonds, 15-year floating-rate bonds, and inflation-indexed bonds. The operation takes the conventional auction style based on differentials between bid rates and the reference rates, which are the previous day's closing rates.

short-term funds-supplying operations since the start of QEP.<sup>9</sup>

However, the Bank judges that it is not appropriate to become over-dependent on the increase in outright purchases of JGBs for the achievement of the target. This is due to the following reasons.

- (1) A large increase in outright purchases of JGBs leads to a large increase of assets which remain for a long time on the balance sheet of the Bank. This may decrease the room for conduct of short-term funds-supplying operations in the future unless the Bank sells the purchased JGBs. Therefore, a large increase in purchases may deprive the Bank of flexibility in market operations in the future.
- (2) A large increase in purchases might misguide the market participants to consider that the operation is a direct effort by the Bank to support JGB prices or to finance government expenditures, which would lead to the distortion of price formation in JGB markets.

Because of these concerns, the Bank adopted a rule that “the outright purchases of JGBs are subject to the limitation that the amounts outstanding of long-term JGBs held by the Bank should be kept below the amounts outstanding of banknotes issued” (chart 15). This rule was established at the Monetary Policy Meeting when QEP was introduced.

### **Other measures**

While the Bank has set an upper limit on the purchase amount of long-term JGBs, the Bank has taken several other measures to induce counterparties’ demand (charts 16, 17).

The first is to have extended the maturity of short-term funds-supplying operations. In operations with longer maturity, a relatively higher amount of bidding is expected because financial institutions can use these operations to secure their future liquidity and to obtain profits or prevent further losses as described earlier. The Bank has extended the maximum maturity for outright purchases of bills and purchases of JGSs with repurchase agreements to up to one year. In this framework, the actual maturity of short-term funds-supplying operations has gradually become longer. The average maturity of total operations, which was around two months at the start of QEP,

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<sup>9</sup> As indicated in chart 13, the increase in TBs underwritten by the Bank is also large. When long-term JGBs held by the Bank mature, the Bank usually underwrites one-year TBs in exchange for the redeemed JGBs.

reached around five months in the fourth quarter of 2004. The average maturity of outright purchases of bills extended to around six months in the same quarter, and the longest maturity of this operation reached eleven months very recently (see chart 21, shown later).

The second measure is to have reduced the smallest unit for bidding in competitive auctions to 0.001 percent from the previous 0.01 percent. This is a measure designed to bring the minimum bidding rate closer to the rate for CABs, which is zero, thereby encouraging counterparties to raise funds through the Bank's operations.

The third is to have expanded the range of counterparties in operations. Through the introduction of bill purchasing operations at all offices of the Bank, a number of financial institutions that have current accounts at the Bank's branch offices became eligible to participate in the Bank's operations. Counterparties for other operations are limited to financial institutions that have accounts at the Head Office. The Bank also abolished the practice of changing participants in rotation among eligible counterparties, a practice which had been commonly referred to as "Rinban operations."

The fourth is to have expanded the range of eligible collateral and eligible securities for outright purchases. After the introduction of QEP, the Bank decided to accept several new types of assets as eligible collateral in the fields of both government and private debt. At the same time, the Bank has expanded the range of eligible securities for outright purchases of long-term JGBs and started, as a temporary measure, the outright purchases of asset-backed securities (ABSs), mainly backed by assets related to small and medium-sized enterprises. Some of these measures, such as the acceptance of a broader range of private debt as eligible collateral and the start of outright purchases of ABSs, have been taken mainly to facilitate smooth corporate financing and support development of the ABS markets in Japan. Measures such as these seem to have enhanced the convenience and usefulness of the operations to counterparties as tools meeting a variety of purposes, thereby contributing to attract a larger amount of bidding.

#### **4-3. Efforts in the daily conduct of operations for successful bidding**

While the Bank has equipped itself with the modified and diversified operational tools mentioned above, the target could not have been achieved merely by mechanically conducting operations. The Bank has faced undersubscription on some

occasions, even when conducting funds-supplying operations with longer maturity to induce demand from counterparties.

This is because even rates on term instruments tend to approach zero under the framework of QEP, which is an outcome caused by the characteristics of QEP itself. QEP has a “duration effect” based on the policy commitment tied to the CPI as described in section 2. In addition to this, massive funds-supplying operations with relatively longer maturity conducted in order to attain the target have a tendency to compress the risk premium on term rates. The latter factor becomes conspicuous when the Bank faces a large shortage in autonomous factors due to swings in treasury funds and thus is forced to accumulate large outstanding balances of funds-supplying operations as noted in section 3. In fact, there is a tendency that TB rates decline to nearly zero as the outstanding balances of the short-term funds-supplying operations become larger (chart 18).<sup>10</sup>

Therefore, in the daily conduct of operations, the Bank’s Operations Desk has to carefully monitor the financial markets, find where demand for funds-supplying operations exists, and formulate plans of operations, including the choice of tools, maturity, and timing, for the smooth provision of funds.

#### **4-4. Impact of foreign exchange intervention on CABs at the Bank**

Foreign exchange intervention (yen selling/foreign currency purchasing intervention) has been undertaken intermittently by the Japanese government. In total, interventions have amounted to over 40 trillion yen since the start of QEP. As the Bank has increased the target level of CABs along with the massive amounts of intervention by the government (chart 19), some may argue that yen selling interventions should have been a major factor in the achievement of higher target levels. However, contrary to such an argument, the series of transactions related to yen selling intervention has a neutral effect by nature on CABs and the Bank’s market operations, since yen funds for the intervention are raised by the government through the issuance of FBs in the market. Here we will discuss the relationship between foreign exchange intervention and CABs, focusing on technical details (chart 20).

Yen selling/foreign currency purchasing intervention is settled on the second

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<sup>10</sup> On the contrary, in the same target range, the levels of CABs do not seem to influence TB rates.

business day after the intervention, and yen funds are paid to private financial institutions from the government. These payments are made through the current accounts at the Bank, and thus cause CABs to increase. On the other hand, the government may raise yen funds needed for the settlement of intervention by temporary “bridging” methods, such as the underwriting of FBs by the Bank and the use of surplus funds in the government account.<sup>11</sup> These methods for raising yen funds are not market transactions and do not affect CABs. Therefore, this transaction causes CABs to temporarily increase. For market operations, to maintain the target level of CABs, the Bank must then conduct funds-absorbing operations or decrease funds-supplying operations.

However, in subsequent days, the government issues FBs in the market to raise yen funds and redeems the FBs that the Bank had underwritten previously. Payments for FBs issued in the market are made to the government through current accounts at the Bank. This process causes CABs to decrease and thus requires the Bank to conduct funds-supplying operations to offset such a decrease.

Consequently, in total, this series of transactions related to yen selling intervention has a neutral effect on CABs and the Bank’s operations. In this regard, yen selling intervention can be a factor in raising the level of CABs immediately after the intervention, but its effect is only temporary by nature. Hence, from the viewpoint of the Operations Desk, yen selling intervention cannot be considered a factor in achieving a higher target level of CABs.

## **5. Concluding Remarks**

This paper has reviewed the Bank’s experiences of open market operations under the framework of QEP introduced in March 2001, focusing on technical aspects from the viewpoint of a practitioner. The achievement of the target has been challenging for the Bank since the target has far exceeded the required reserves and financial

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<sup>11</sup> The Bank’s “Basic Outline of Transactions with the Government” (adopted by the Policy Board on March 26, 1999) states: “In case of unanticipated demand for funds by the Treasury, as an exceptional measure, the Bank may underwrite FBs.” At the same time, the following provision is made for such FBs underwritten: “Such FBs shall be redeemed as soon as possible by using funds raised from the next public placement of FBs and after.” The temporary underwriting of FBs for foreign exchange intervention is based on this provision.

institutions have not had incentives to hold a large amount of excess reserves. The background for the achievement of the high target levels of CABs under QEP can be summarized as follows.

- (1) Counterparties regard the Bank's operations as financial transactions for a wide variety of purposes rather than a means merely for accumulating their CABs for immediate reserve requirements and settlement needs. Securing future liquidity and obtaining profits are major motives for bidding operations. As a consequence of bidding, counterparties come to hold excess reserves whose opportunity cost is almost zero. Financial system instability and malfunctioning of the money markets have been important factors behind the demand for operations, the latter of which may have been induced, to some extent, by QEP itself.
- (2) To stimulate counterparties' demand for operations, the Bank has taken various measures. One of the effective measures has been to increase outright purchases of long-term JGBs. The Bank has set an upper limit on the purchase amount in order to secure future flexibility in market operations and to indicate that the purpose of its operations is not to finance government expenditures. The Bank has also modified other operational tools, such as extending the maturity for short-term operations.
- (3) In addition to the modification of operational tools, the Bank's Operations Desk has made daily efforts more than ever for successful bidding, in terms of detecting subtle changes in financial market transactions and utilizing various types of operational tools. Such daily efforts have been necessary since large fluctuations of autonomous factors have occasionally forced the Bank to accumulate larger outstanding amounts of funds-supplying operations over a short period of time in an environment where even term instruments bear zero interest rates.
- (4) Yen selling intervention in the foreign exchange market cannot be considered a factor in achieving higher target levels of CABs, since the series of transactions related to yen selling interventions has a neutral effect by nature on CABs and the Bank's operations.

In concluding this paper, we would like to briefly refer to the recent open market operations. Since last autumn, a declining trend has been observed in the bid-cover ratio for short-term funds-supplying operations (chart 21). Such a recent change in the performance of operations can be attributed mainly to reduced anxiety over the soundness of Japan's financial system.

The "first motive" of counterparties to bid in operations discussed in section 4-1,

which is to secure future liquidity, has become smaller along with the abating of concerns over the financial system. In such improved financial system conditions, negative yen funding costs in the currency swap market have been contracting and consequently foreign banks' demand for CABs has been decreasing. This has led to the accumulation of domestic banks' CABs and thereby increased the sense of excess liquidity in the market. Such a perceived excess liquidity has contributed to the decline in rates on FBs and TBs to almost zero. This has exacerbated the sliding amount of bidding in operations based on the "second motive," which is to secure profits. In these circumstances, the Operations Desk has taken several measures such as the extension of the maturity in the daily conduct of operations to achieve the target. The longest maturity for outright purchases of bills reached to eleven months in March.

Although the target has been achieved with the effects of these measures, the level of CABs has occasionally decreased close to the lower bound of the target due to repeated unsuccessful auctions in funds-supplying operations. In prospecting future developments of market operations, one of the important changes recently observed is that some banks seem to be becoming reluctant to hold a large amount of excess reserves due to awareness of the expansion of their balance sheet and the low return on assets (ROA). ROA tends to decline as financial institutions hold a larger amount of CABs bearing no interest rate. Although the opportunity cost in terms of interest rates is still close to zero, some banks recently seem to have begun regarding low ROA as a cost of holding excess reserves as they focus more on profitability of their assets.

The question of how much excess reserves the central bank can provide rests unanswered. The recently observed signs of change mentioned above, although still unclear whether they may be an underlying trend, may be important in discussing this question.



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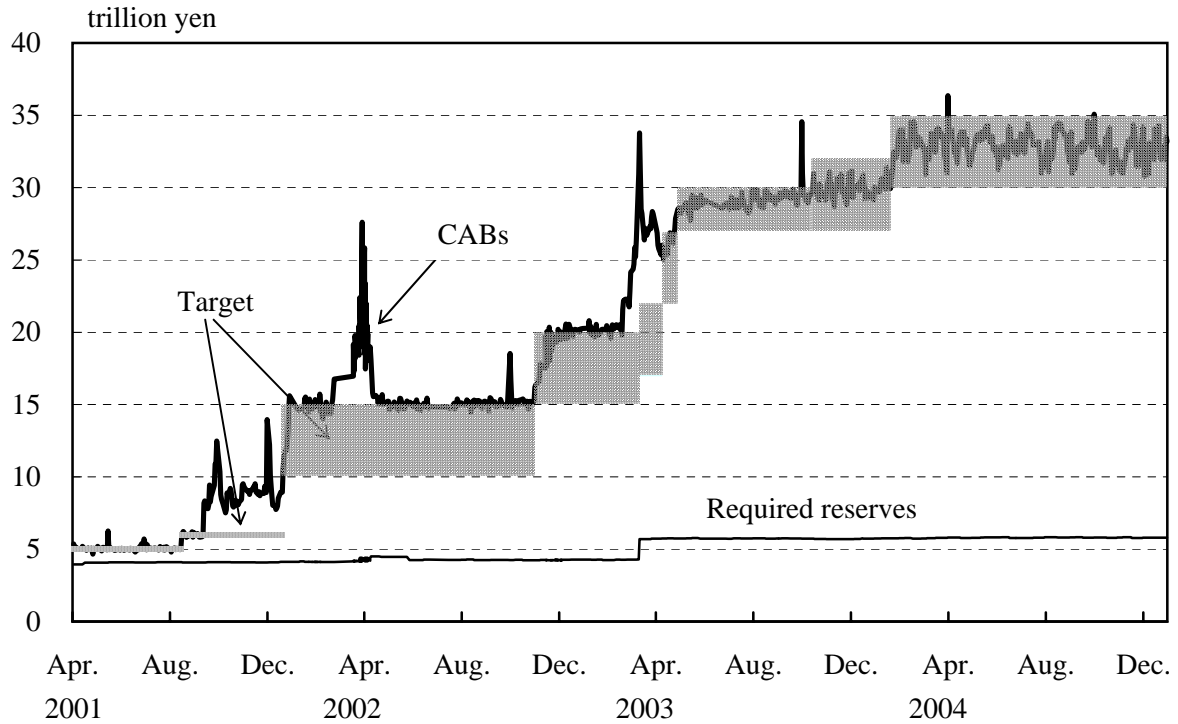
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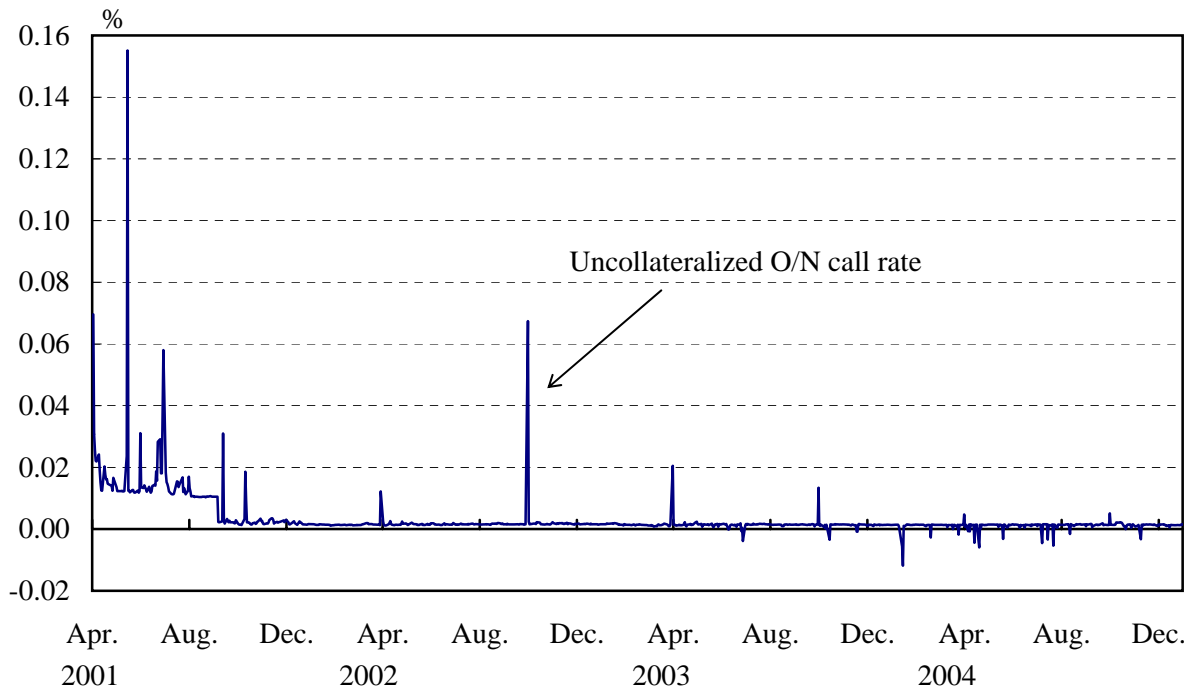
<sup>12</sup> Papers and a speech listed here can be accessed at <http://www.boj.or.jp/en/index.htm> and at <http://www.bis.org/publ/bispapers.htm>.

[Chart 1] Current Account Balances (CABs) at the Bank and Overnight Call Rate

**(1) CABs at the Bank**

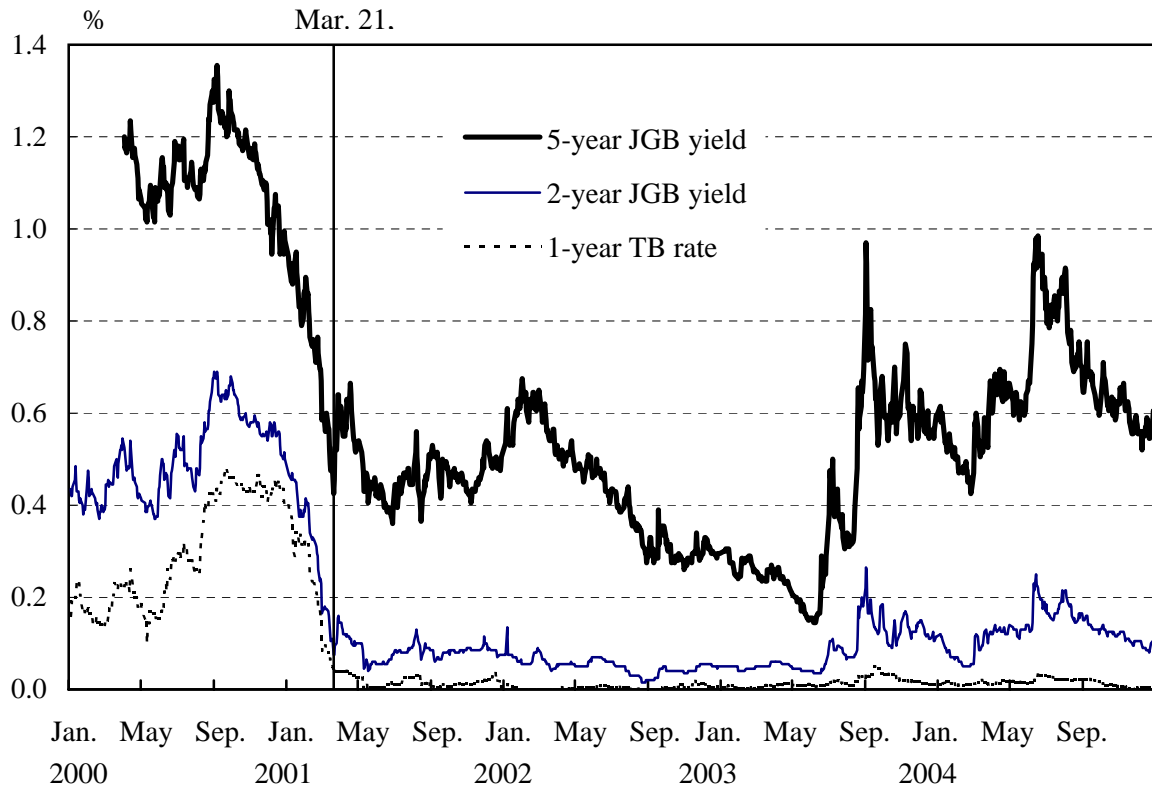


**(2) Uncollateralized Overnight Call Rate**



Source: Bank of Japan.

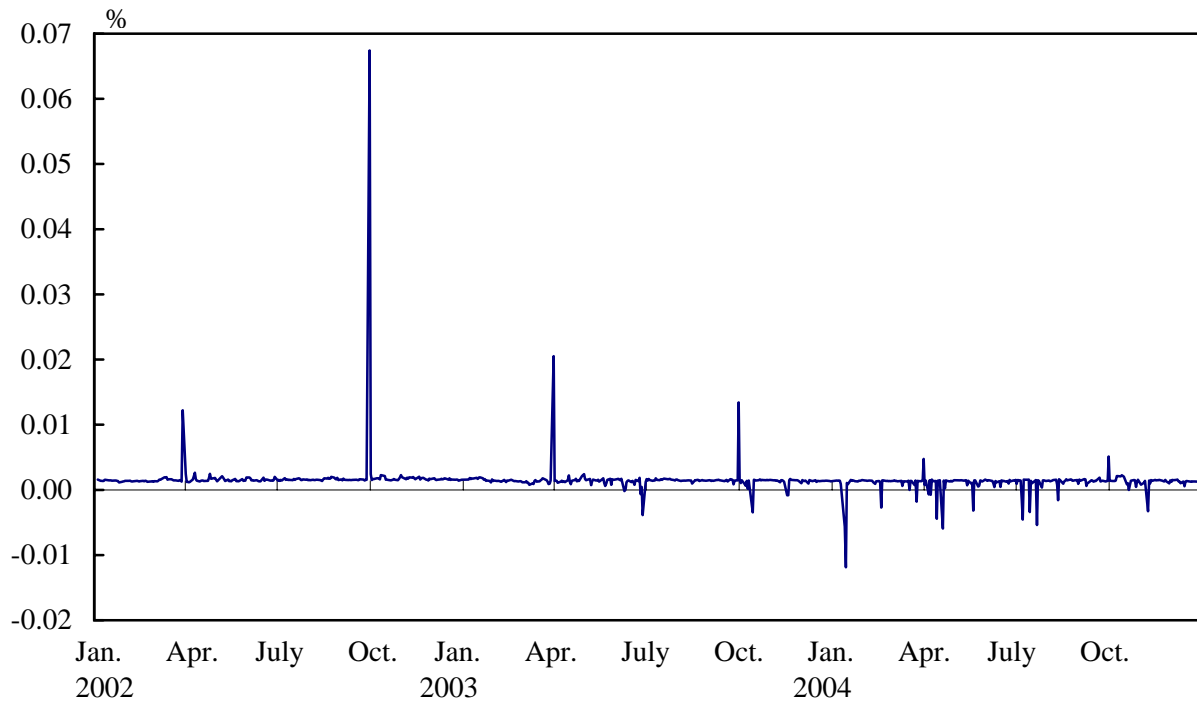
[Chart 2] Rates on TBs and JGBs



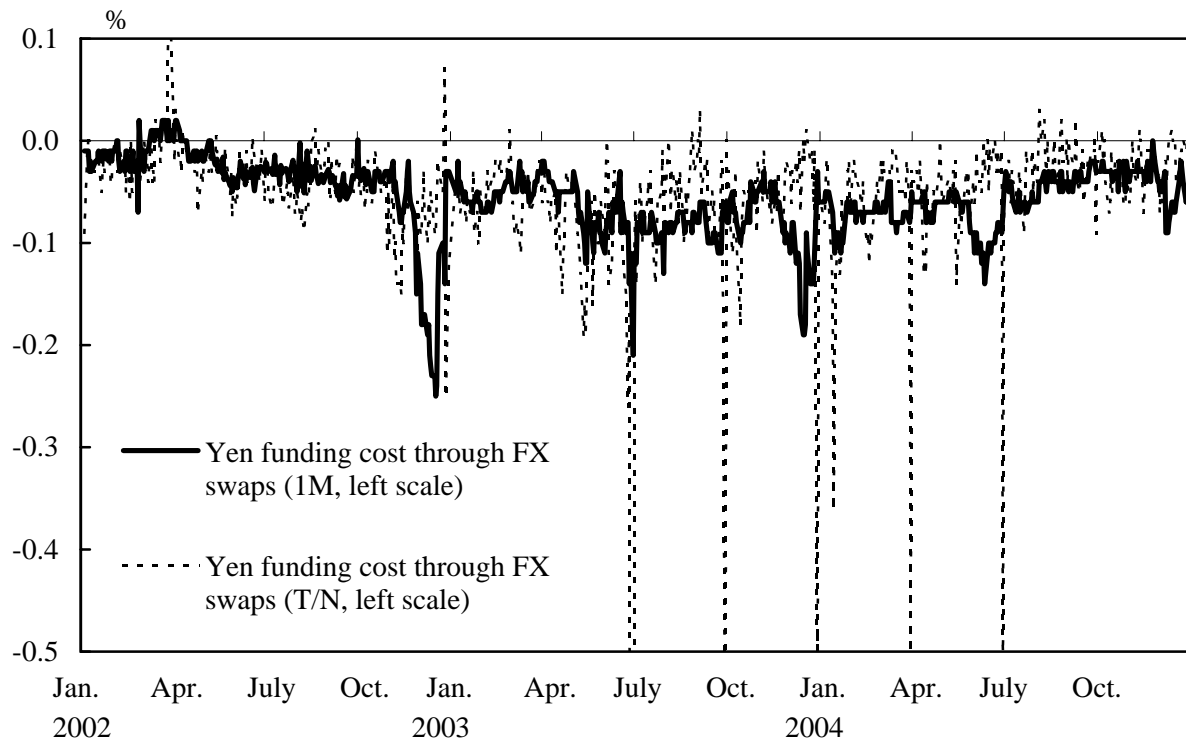
Source: Japan Bond Trading Co., Ltd.

[Chart 3] Call Rate and Yen Funding Costs through Foreign Exchange (FX) Swaps

**(1) Uncollateralized Call Rate (O/N)**



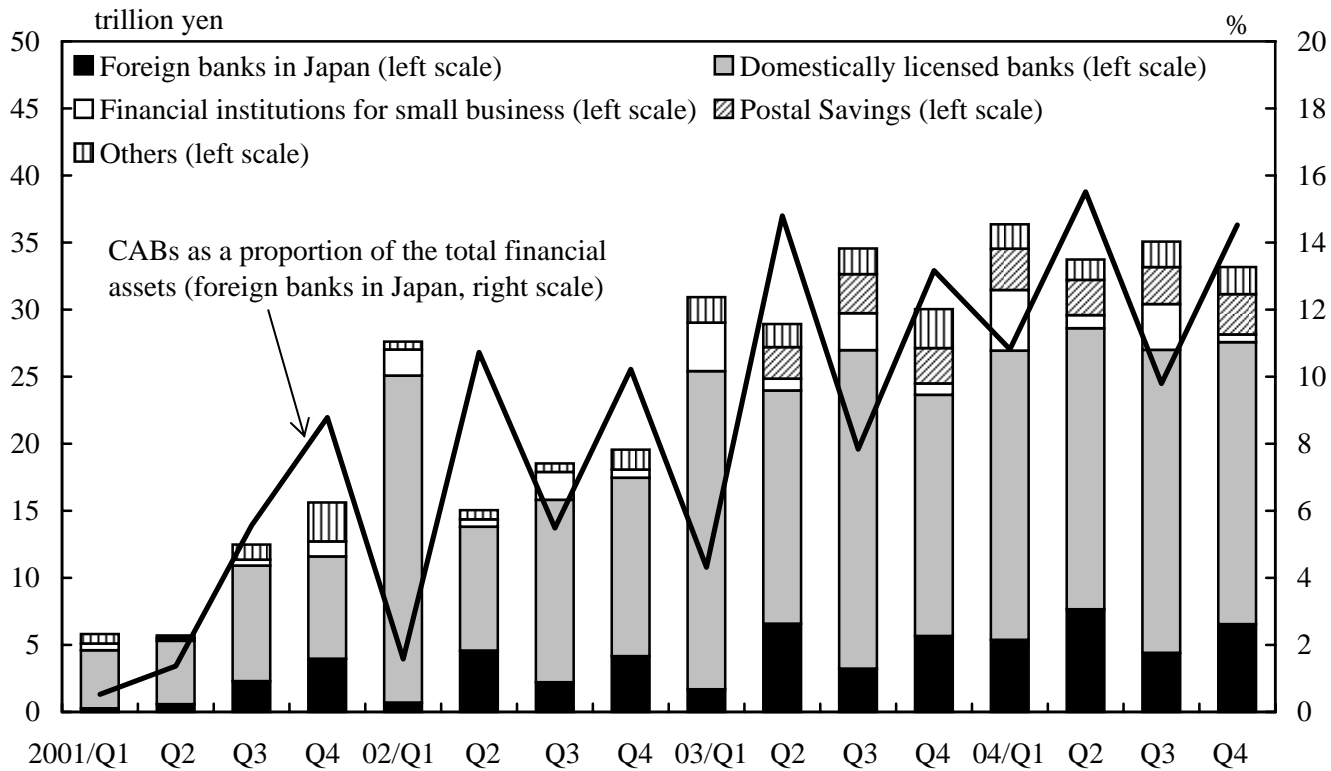
**(2) Yen Funding Costs through FX Swaps**



Note: Yen funding cost is computed based on the interest rate for raising U.S. dollar funds and the forward spread (spread between spot and forward FX rates).

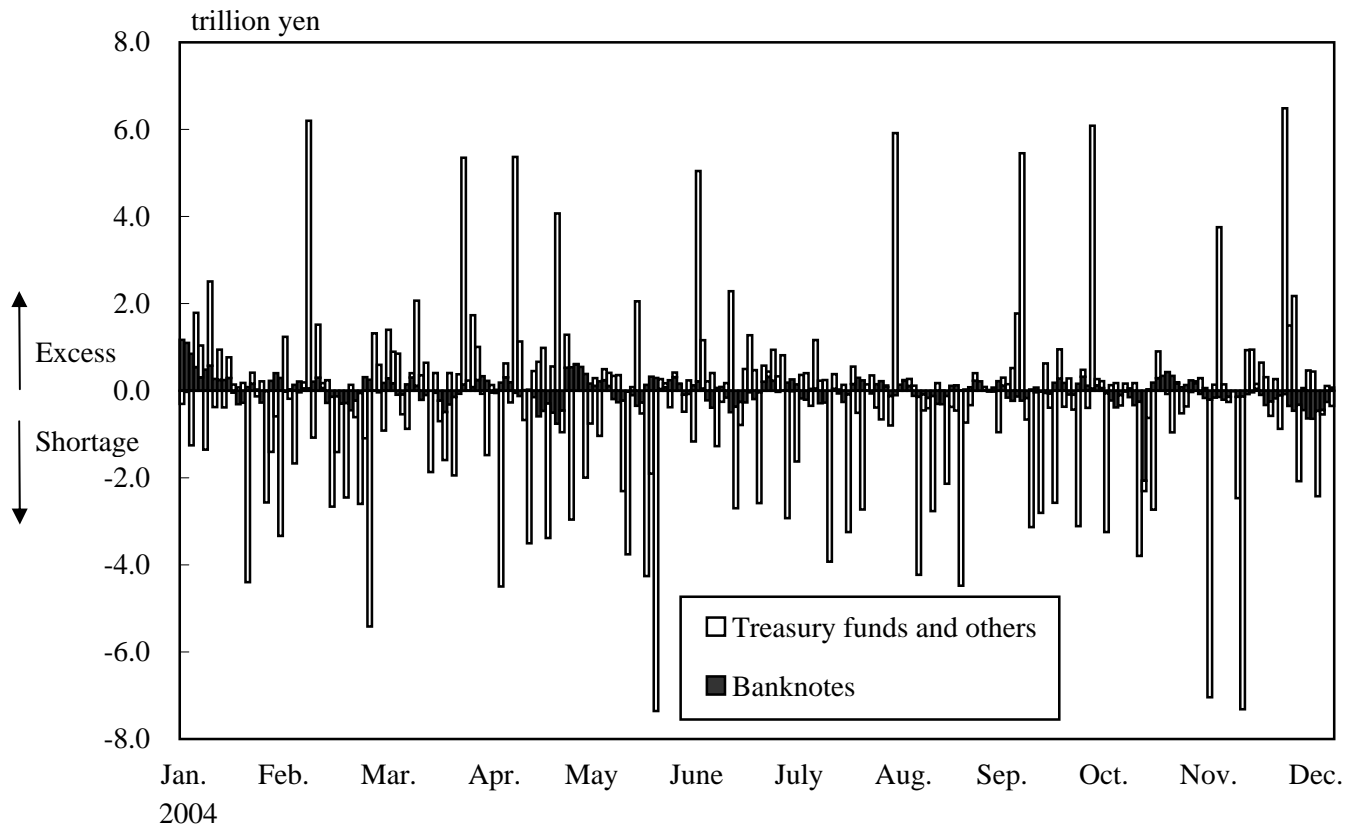
Source: Bank of Japan.

[Chart 4] CABs at the Bank by Sector



Source: Bank of Japan, "Flow of Funds Accounts."

[Chart 5] Daily Changes in Autonomous Factors Affecting CABs at the Bank



Source: Bank of Japan, "Sources of Changes in Current Account Balances at the Bank of Japan and Market Operations."

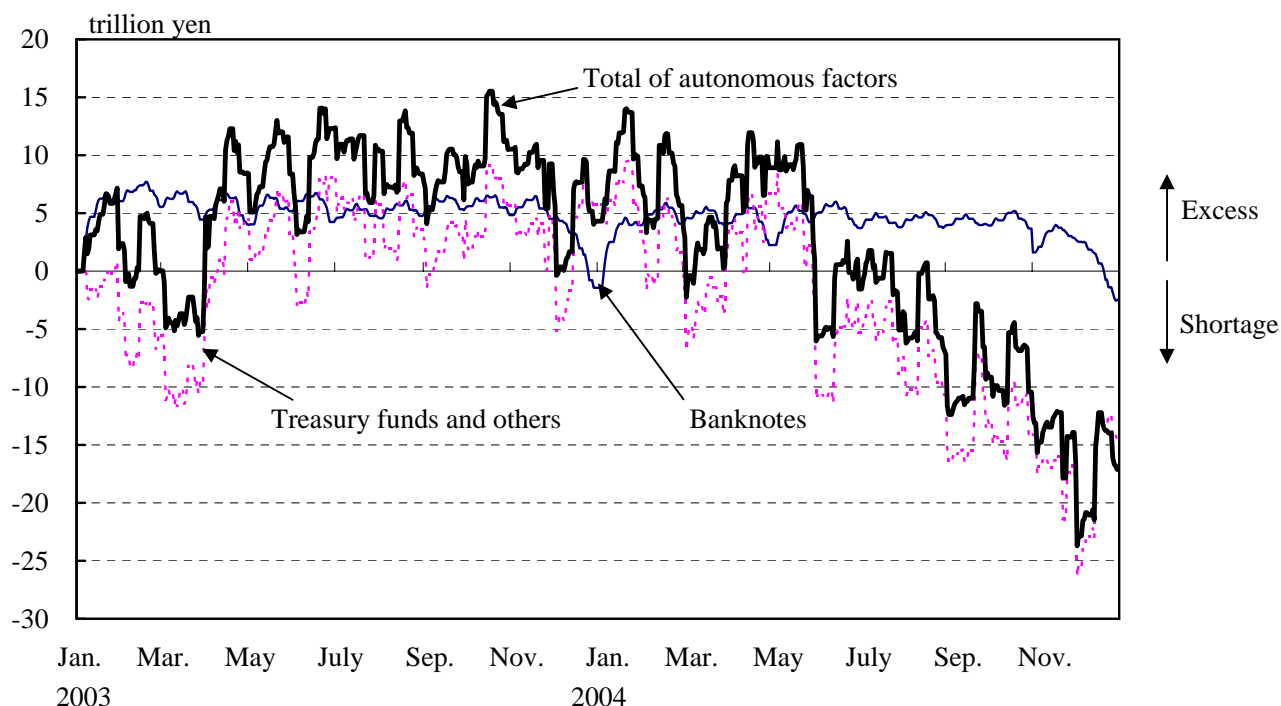
[Chart 6] Daily Volatility of Autonomous Factors in the Euro Area, the United States, and Japan

		Volatility in 1999 (% of required reserve balance)		
		Average absolute change	Maximum absolute change	Standard deviation
Eurosystem	Banknotes	0.76	3.63	0.96
	Treasury funds	3.47	24.39	5.45
	Net balance	3.72	24.57	5.80
Federal Reserve	Banknotes	6.62	39.75	8.26
	Treasury funds	6.55	55.02	10.66
	Net balance	14.38	130.27	18.68
Bank of Japan	Banknotes	8.97	42.96	11.83
	Treasury funds	23.78	232.15	41.58
	Net balance	24.67	217.18	40.96

Source: Bank for International Settlements, BIS Papers No.9, "Comparing monetary policy operating procedures across the United States, Japan and the euro area," 2001.

[Chart 7] Autonomous Factors and the Bank's Market Operations

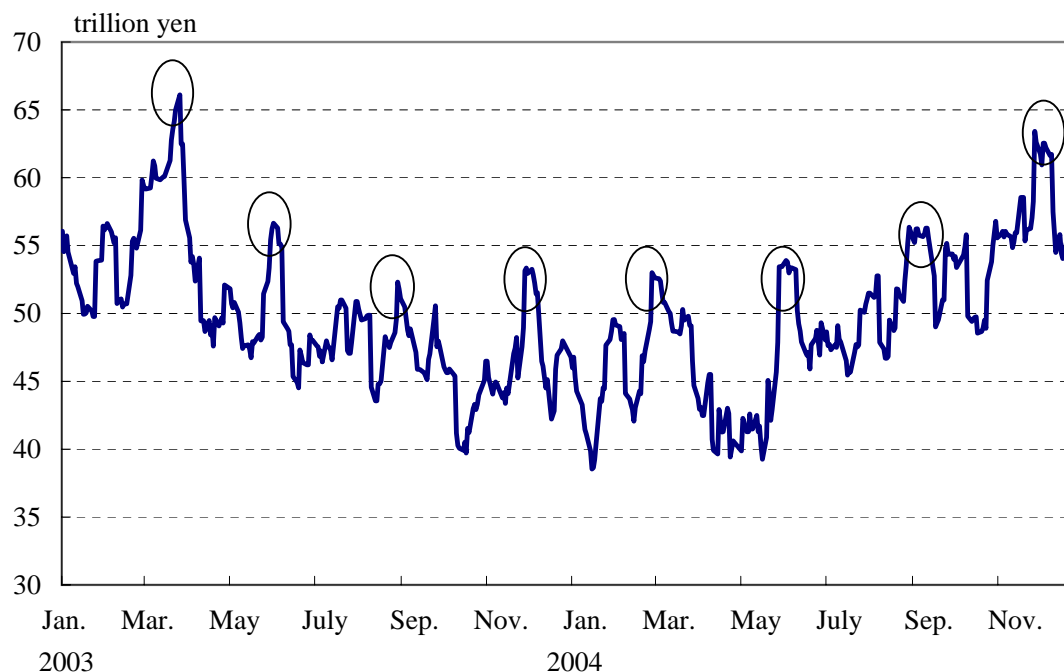
(1) Autonomous Factors Affecting CABs (Cumulative Amount with End-2002 as Zero)



Note: Adjusted for the effect of TB/FB purchasing operations.

Source: Bank of Japan, "Sources of Changes in Current Account Balances at the Bank of Japan and Market Operations."

(2) Outstanding Balances of Short-Term Funds-Supplying Operations



Note: Outstanding balances of short-term funds supplying operations are the sum of short-term operations for funds provision minus short-term operations for funds absorption listed in Chart 8.

Source: Bank of Japan, "Sources of Changes in Current Account Balances at the Bank of Japan and Market Operations."



[Chart 8] Instruments for Market Operations

Instrument		Structure	Term	Maturity	Eligible assets to be purchased/sold	Settlement convention
Funds provision	Outright purchases of JGBs	Outright	Long-term	JGBs (2Y, 4Y, 5Y, 6Y, 10Y, 20Y)		T+3
	Outright purchases of TBs/FBs			TBs, FBs		T+2-3
	Outright purchases of ABSs (including ABCP)*			Eligible ABSs (including ABCP)		T+2
	Purchases of JGSs with repurchase agreements	Repurchase agreement	Short-term	Within 1 year	TBs, FBs, and JGBs (2Y, 4Y, 5Y, 6Y, 10Y, 20Y)	T+0-2
	Outright purchases of bills (at Head Office and all offices)**			Within 1 year	Master bills (collateralized by eligible assets***)	T+0-4
	Purchases of CP with repurchase agreements			Within 3 months	Eligible CP	T+2
Funds absorption	Outright sales of TBs/FBs	Outright		TBs/FBs held outright by BOJ		T+2-3
	Sales of JGSs with repurchase agreements	Repurchase agreement	Short-term	Within 6 months	TBs/FBs and JGBs held outright by BOJ	T+0-2
	Outright sales of bills			Within 3 months	Bills issued by BOJ	T+0-4

- Notes:
- \* Most of ABSs purchased through the operation are ABCP whose maturities are within one year.
  - \*\* "Outright purchase of bills" is a kind of collateralized loan to financial institutions whose interest rates are determined in competitive yield auctions.
  - \*\*\* JGBs and eligible commercial bills (including CP), corporate bonds, loans on deeds, asset-backed securities, etc.

Source: Bank of Japan.

[Chart 9] Outstanding Balances of Short-Term Operations

(trillion yen, outstanding at end of month)

	2000/Dec.	2001/Dec.	2002/Dec.	2003/Dec.	2004/Dec.
Net outstanding balances of short-term operations	47.5	56.8	56.7	48.0	58.0
Provision of short-term funds	50.7	57.1	58.4	48.0	59.1
Purchases of JGSs with repurchase agreements	43.2	11.5	3.7	3.3	2.8
Outright purchases of bills	4.0	20.7	28.0	23.8	36.1
At Head Office	4.0	11.1	8.1	7.4	14.7
At all offices	—	9.6	19.9	16.4	21.4
Purchases of CP with repurchase agreements	3.6	3.6	3.8	2.8	2.7
Outright purchases of TBs/FBs	0.0	21.4	22.8	18.0	17.5
Outright purchases of ABSs	—	—	—	0.1	0.1
Absorption of short-term funds	3.2	0.3	1.7	0.0	1.1
Sales of JGSs with repurchase agreements	0.4	0.0	0.0	0.0	0.5
Outright sales of bills	2.8	0.3	1.7	0.0	0.0
Outright sales of TBs/FBs	0.0	0.0	0.0	0.0	0.6

Notes: 1. The amount of purchases of JGSs with repurchase agreements in 2000/Dec. is the sum of the amounts of JGB borrowings and TB/FB purchases with repurchase agreements.

2. The amount of sales of JGSs with repurchase agreements in 2000 and 2001 are the amount of TB/FB sales with repurchase agreements.

Source: Bank of Japan, "Sources of Changes in Current Account Balances at the Bank of Japan and Market Operations."

[Chart 10] Number of Counterparties for the Bank's Market Operations

	Total			
		JGS-related	Outright purchases of bills	
			At all offices	At Head Office
City banks	7	7	7	7
Trust banks	7	2	7	6
Regional banks and regional banks II	72	1	72	3
Foreign banks	12	7	12	8
Securities firms	26	26	20	7
<i>Shinkin</i> banks	9	0	8	0
<i>Tanshi</i> companies (money market brokers)	3	3	3	3
Others	11	9	11	9
Total	144	52	137	40

Notes: 1. The figures are as of 2004.

2. Outright purchase of bills at all offices is conducted with financial institutions which hold accounts at Head Office and all branches of the Bank, while outright purchase of bills at Head Office is conducted only with those which hold accounts at Head Office of the Bank.

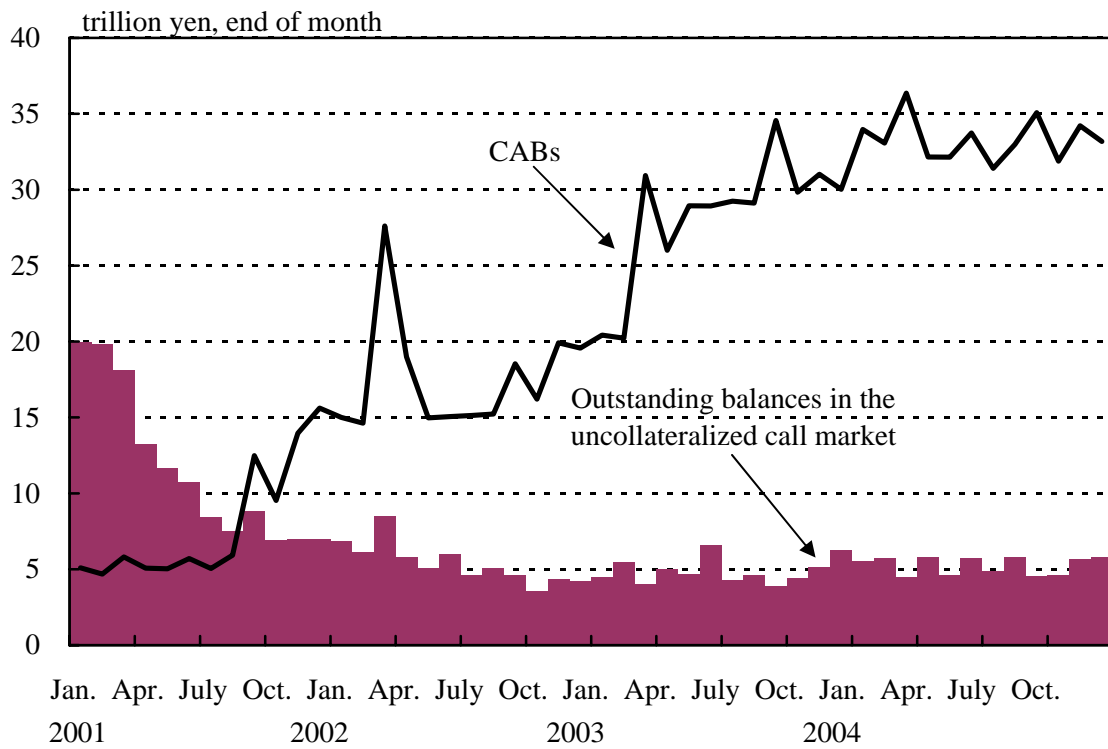
[Chart 11] Frequency of Undersubscription in Funds-supplying Operations

	number of times	
	Offers	Undersubscriptions
2001	542	16
2002	459	171
2003	310	17
2004	310	23
2005/Jan.-Feb.	72	33

Note: Funds-supplying operations include purchases of JGSs with repurchase agreements, outright purchases of bills at Head Office, outright purchases of bills at all offices, purchases of CP with repurchase agreements, outright purchases of TBs/FBs, and outright purchases of JGBs.

Source: Bank of Japan.

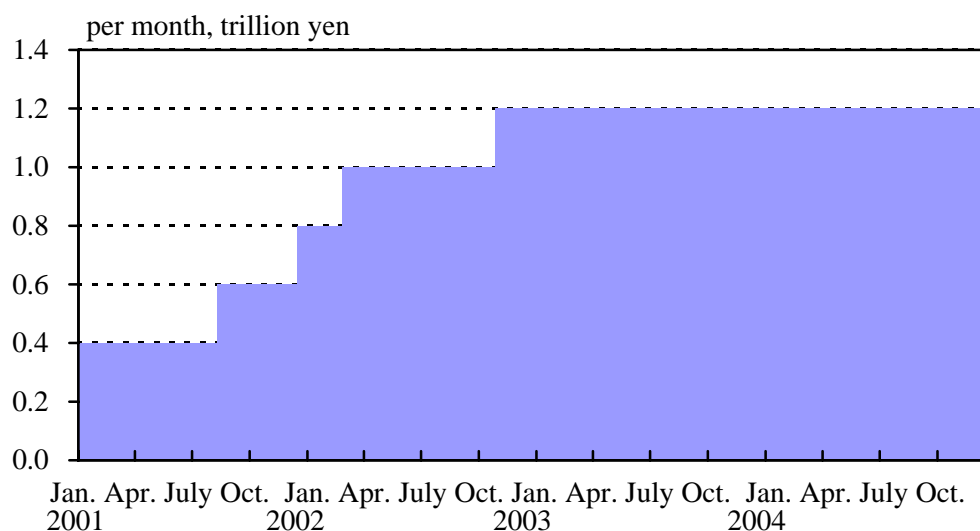
[Chart 12] CABs and Outstanding Balances in the Uncollateralized Call Market



Source: Bank of Japan, "Amounts Outstanding in the Call Money Market,"  
 "Monetary Base and the Bank of Japan's Transactions."

[Chart 13] Outright Purchases of Long-Term JGBs

(1) Amount of Outright Purchase of Long-Term JGBs



Source: Bank of Japan.

(2) BOJ's Balance Sheet

trillion yen

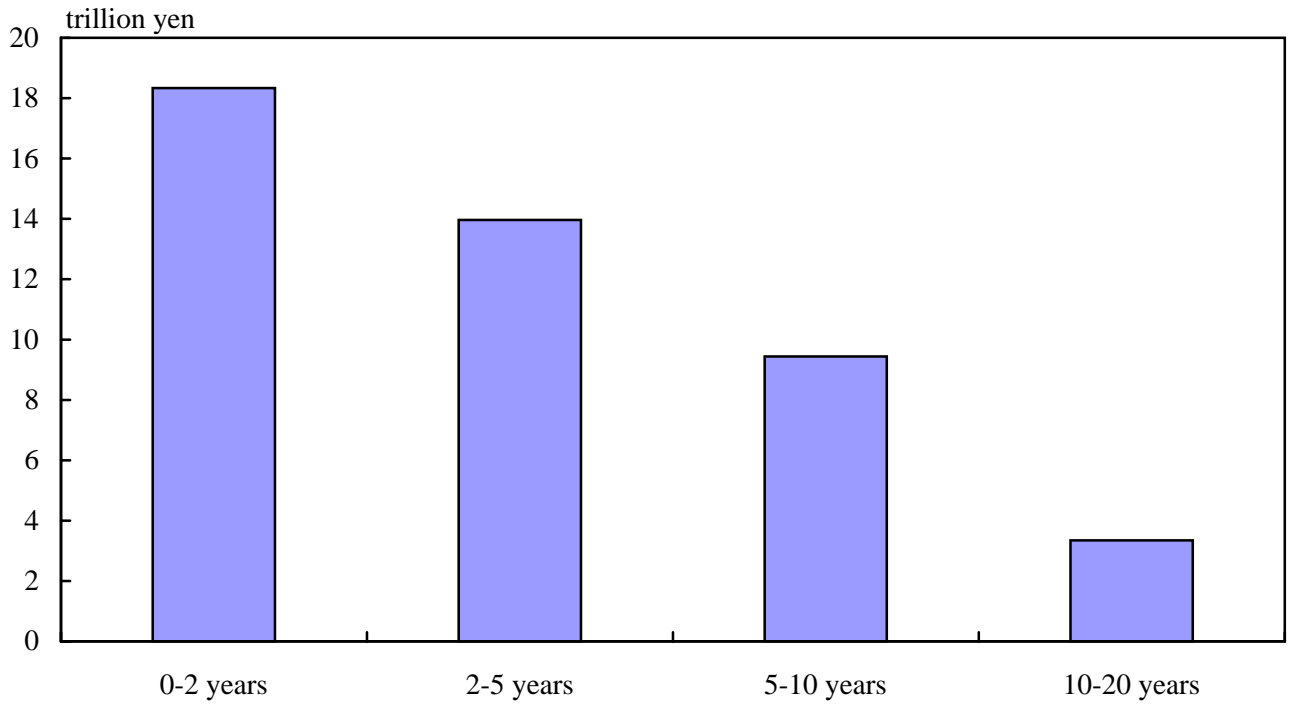
	Dec. 2000	Dec. 2004	
<b>Assets</b>			
Long-term JGBs	45.1	65.1	(+20.0)
TBs/FBs underwritten	5.2	14.5	(+9.3)
Short-term funds-supplying operations	47.5	56.3	(+8.7)
Others	9.0	8.7	(- 0.3)
<b>Liabilities</b>			
Banknotes	63.4	78.0	(+14.6)
CABs	6.8	33.2	(+26.4)
Government deposits and other debt	27.4	24.5	(- 2.9)
Others	9.2	8.9	(- 0.3)
<b>Total</b>	<b>106.8</b>	<b>144.5</b>	<b>(+37.8)</b>

Notes: 1. The figures in parentheses are the difference.

2. "Other debt" is the sale of JGBs to the government with repurchase agreements.

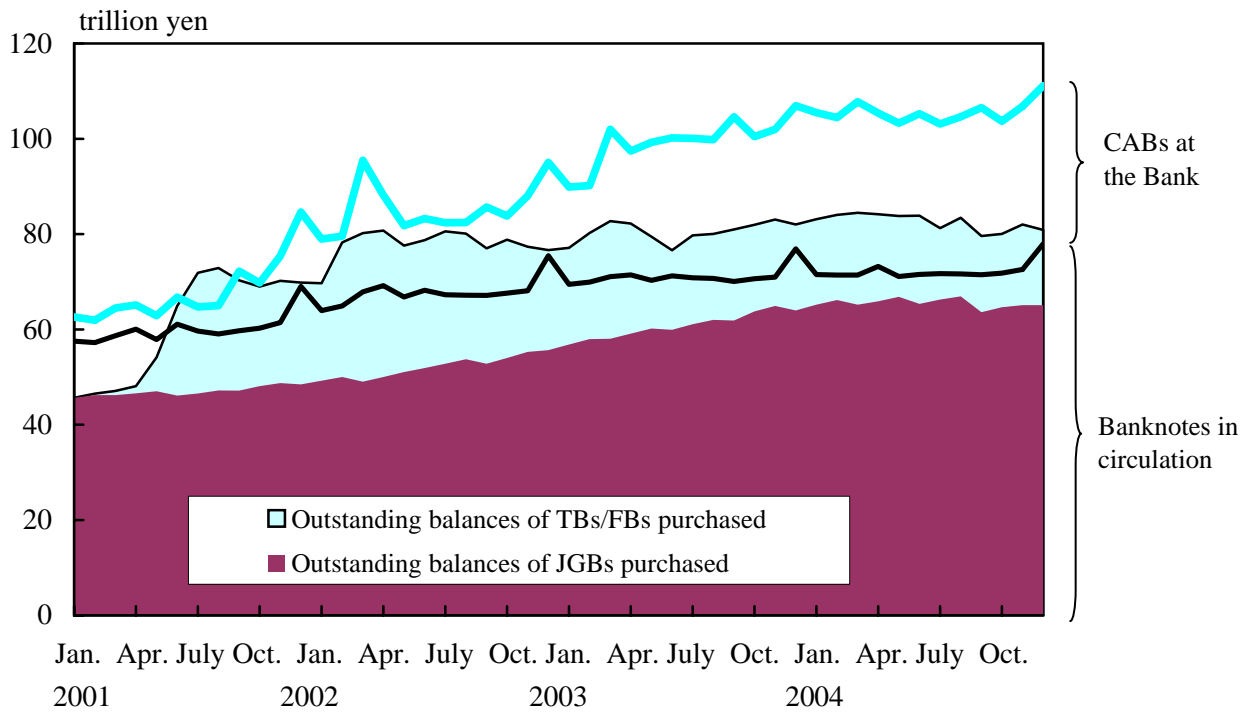
Source: Bank of Japan, "Monetary Base and the Bank of Japan's Transactions,"  
"Bank of Japan Accounts."

[Chart 14] Remaining Maturity of JGBs Purchased through Operations



Note: The figures are the sum of the JGBs purchased from May 2001 until December 2004.  
Source: Bank of Japan.

[Chart 15] Outstanding Balances of JGBs and TBs/FBs Purchased by the Bank, Banknotes in Circulation, and CABs



Source: Bank of Japan, "Monetary Base and the Bank of Japan's Transactions."

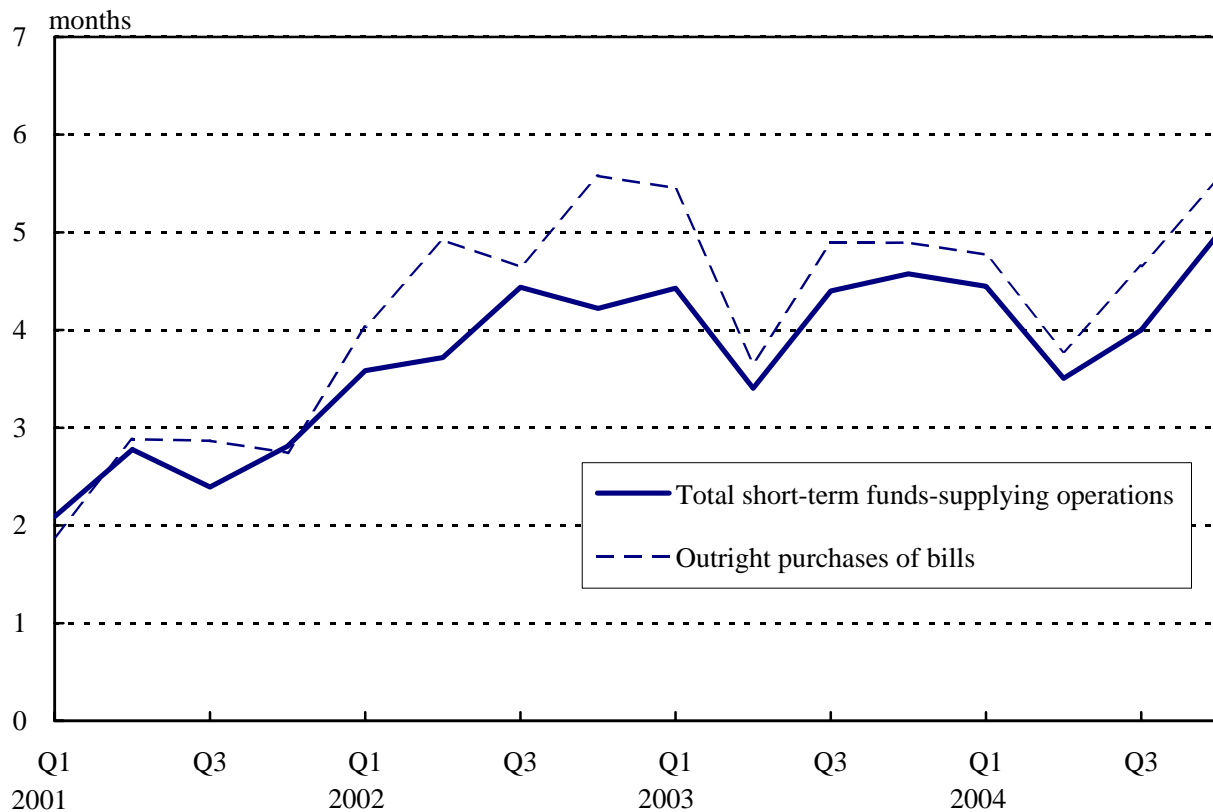


[Chart 16] Maturity of Short-Term Funds-Supplying Operations

**(1) Extension of the Maximum Maturity of Short-Term Funds-Supplying Operations**

	Maximum maturity	
Outright purchase of bills by the Bank	May 2001 3 months	Oct. 2002 1 year
JGB repos	Oct. 2003 6 months	1 year

**(2) Maturity of Short-Term Funds-Supplying Operations**



Notes: 1. "Total Short-term funds-supplying operations" is based on the quarterly offerings of the following operations and is derived as the weighted-average amount of (1) the maturity of bill purchases, JGS repo transactions, and CP purchases with repurchase agreements, and (2) the remaining maturity of issues actually purchased in outright TB/FB purchase operations.

2. "Outright purchases of bills" include outright purchases of bills at Head Office and those at all offices.

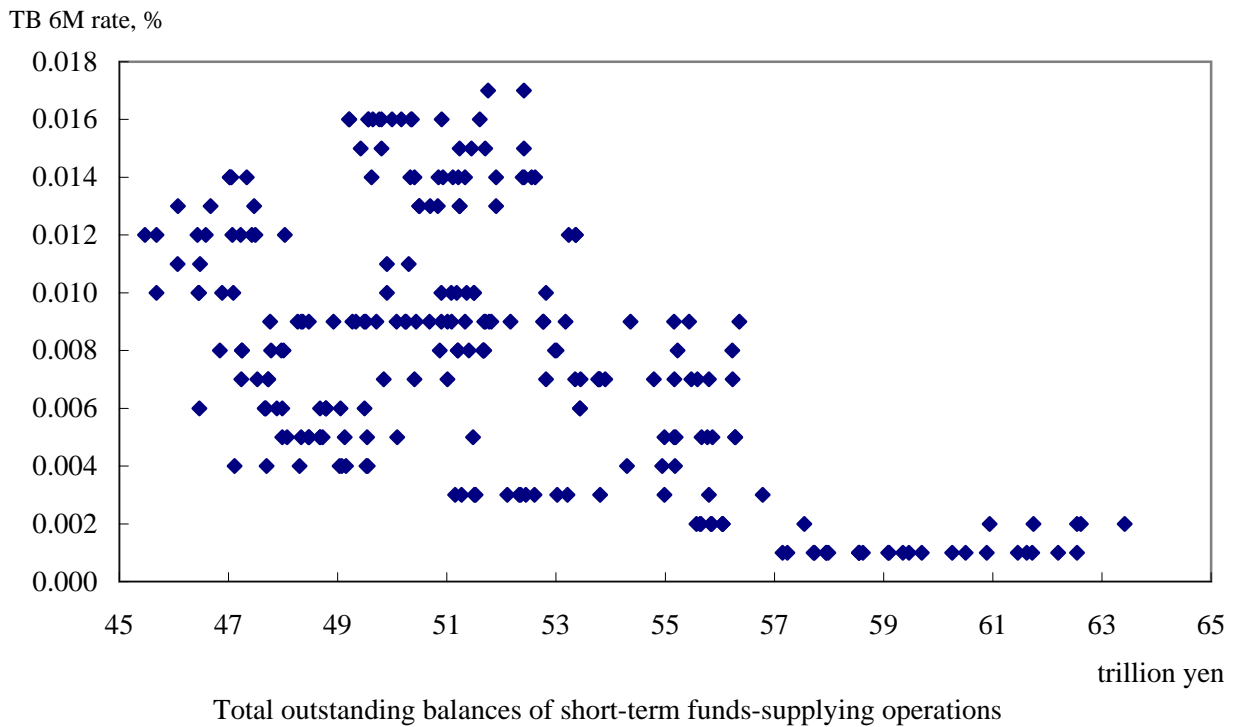
[Chart 17] Other Measures as part of the Bank's Operational Tools

Effective Date	Measures
May 2001	Increase in the number of eligible counterparties in outright bill purchasing operations at the Bank's Head Office. - Increase from 30 counterparties to 40 counterparties.
May 2001-July 2001	Introduction of smaller units for bid rates in competitive yield auctions. - Change in unit of bids from 0.01 percent (two decimal places) to 0.001 percent (three decimal places) for every competitive yield auction.
June 2001	Expansion of the range of JGBs in the outright purchases of JGBs. - Acceptance of 2, 4, 5 and 6-year government bonds in addition to 10-year and 20-year government bonds in the outright purchases of JGBs.
July 2001	Introduction of outright bill purchasing operations at all offices.
Dec. 2001	Abolishment of the practice of changing participants in rotation within eligible counterparties (commonly referred as "Rinban operations") in the outright purchases of JGBs, JGB repo operations, CP purchase operations with repurchase agreements, and bill selling operations.
Jan. 2002	Expansion of the range of bonds to be purchased in the outright purchases of JGBs. - A change from the exclusion of JGBs issued within a year, to the acceptance of JGBs issued within a year excluding the latest two issues of each maturity.
Feb. 2002	Acceptance of ABCP as eligible collateral and as an eligible asset for CP purchase operations with repurchase agreements. Acceptance of ABSs backed by mortgage loans and cash flows generated by real estate as eligible collateral.
Mar. 2002	Acceptance of loans on deeds to the Deposit Insurance Corporation as well as loans on deeds to the Government's Special Account for the Allotment of Local Allocation Tax and Local Transfer Tax as eligible collateral.
Dec. 2002-Jan. 2003	Acceptance of a broader range of ABCP as eligible collateral. Modification of standards for collateral of loans on deeds. Acceptance of STRIPS government securities as eligible collateral.
Mar. 2003	Acceptance of dematerialized CP and dematerialized ABCP as eligible collateral.
Apr. 2003	Acceptance of loans on deeds to the Industrial Revitalization Corporation of Japan with government guarantee as eligible collateral.
June 2003	Acceptance of dematerialized CP and dematerialized ABCP as eligible assets for CP purchase operations with repurchase agreements.
July 2003	Establishment of the outright purchases of ABSs including ABCP.
Nov. 2003	Acceptance of syndicated loans arranged in the form of loans on deeds as eligible collateral.
Jan. 2004	Modification of the conditions regarding the outright purchases of ABSs including ABCP.
Mar. 2004	Acceptance of inflation-indexed JGBs as eligible collateral. Acceptance of loans on deeds to the Banks' Shareholdings Purchase Corporation with government guarantee as eligible collateral.

Source: Bank of Japan.

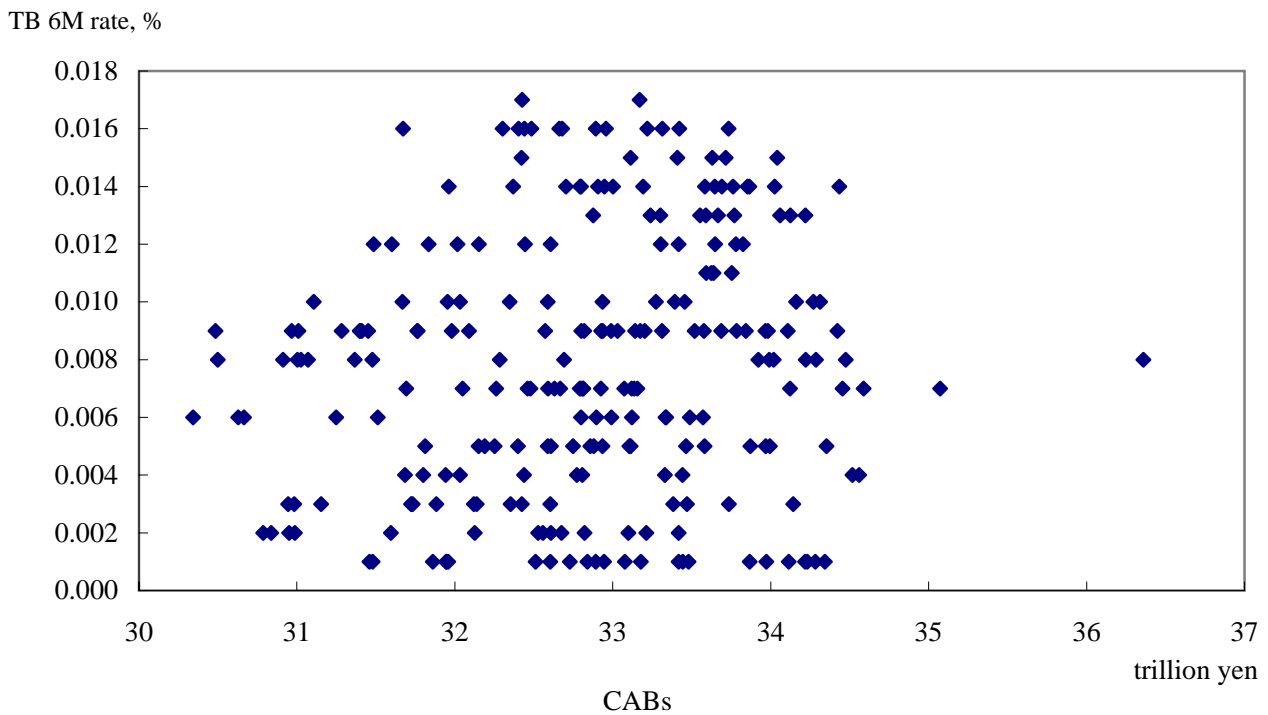
[Chart 18] Factors Affecting the TB Rate

(1) Short-Term Funds-Supplying Operations and TB Rates (During 2004)



Sources: Bank of Japan; Japan Bond Trading Co., Ltd.

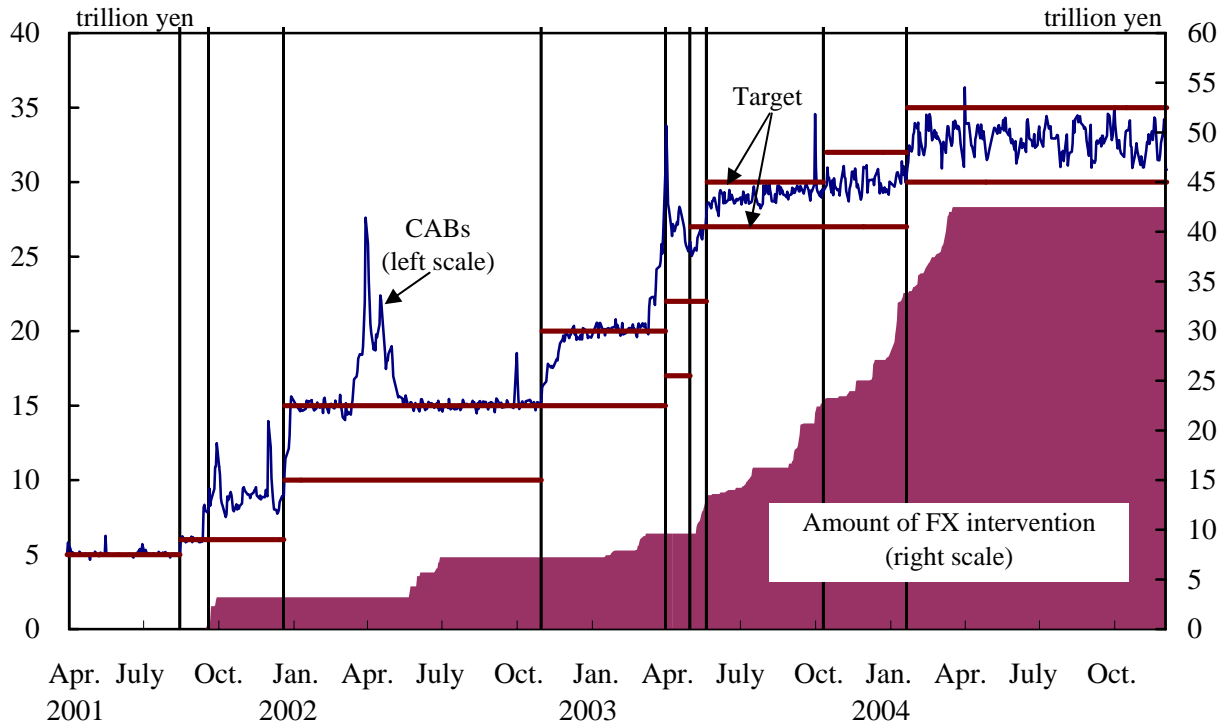
(2) CABs and TB Rates (During 2004)



Sources: Bank of Japan; Japan Bond Trading Co., Ltd.

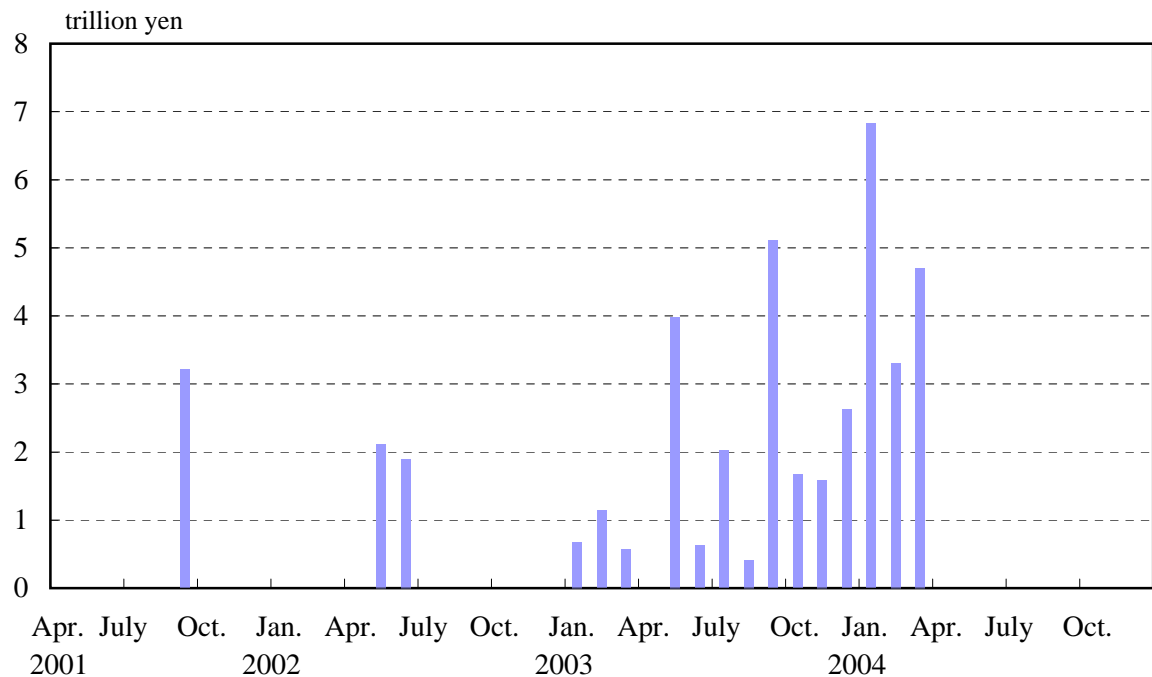
[Chart 19] FX Intervention and CABs

**(1) Cumulative Amount of FX Intervention and CABs during the Quantitative Easing Policy**



Sources: Bank of Japan;  
 Ministry of Finance, "Sources on the Implementation of Foreign Exchange Balancing Operations."

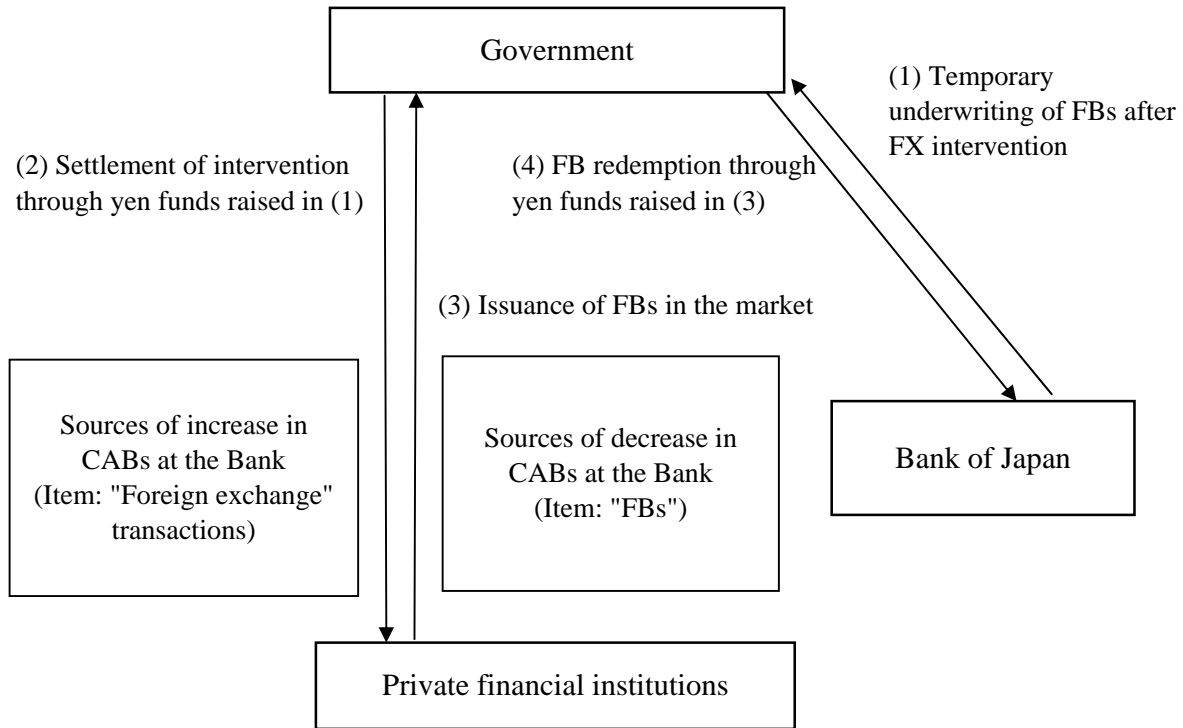
**(2) Volume of FX Intervention (Monthly Total)**



Source: Ministry of Finance, "Sources on the Implementation of Foreign Exchange Balancing Operations."

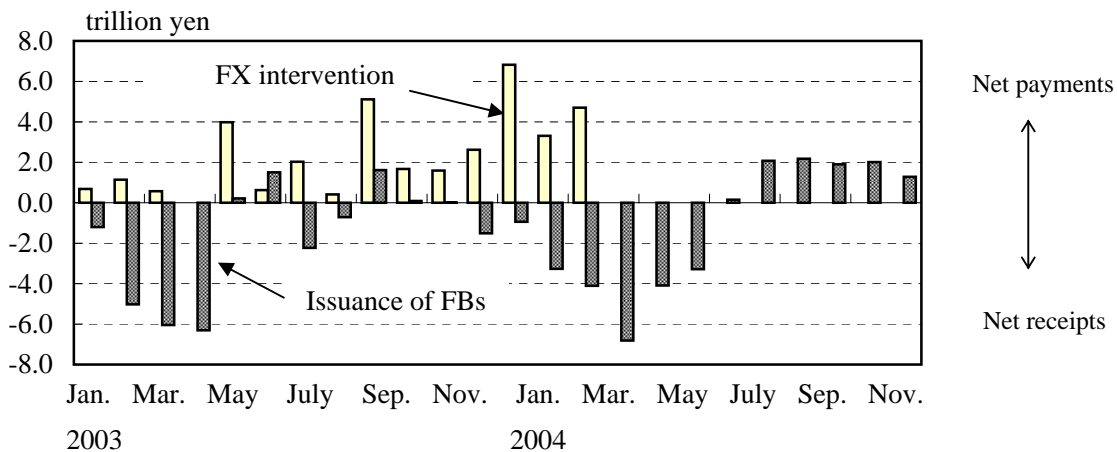
[Chart 20] Impact of FX Intervention on CABs

**(1) Flow of Yen Funds in Yen-Selling Market Intervention**



Note: The above describes a case in which the Bank temporarily underwrites FBs.

**(2) FX Intervention and Issuance of FBs**

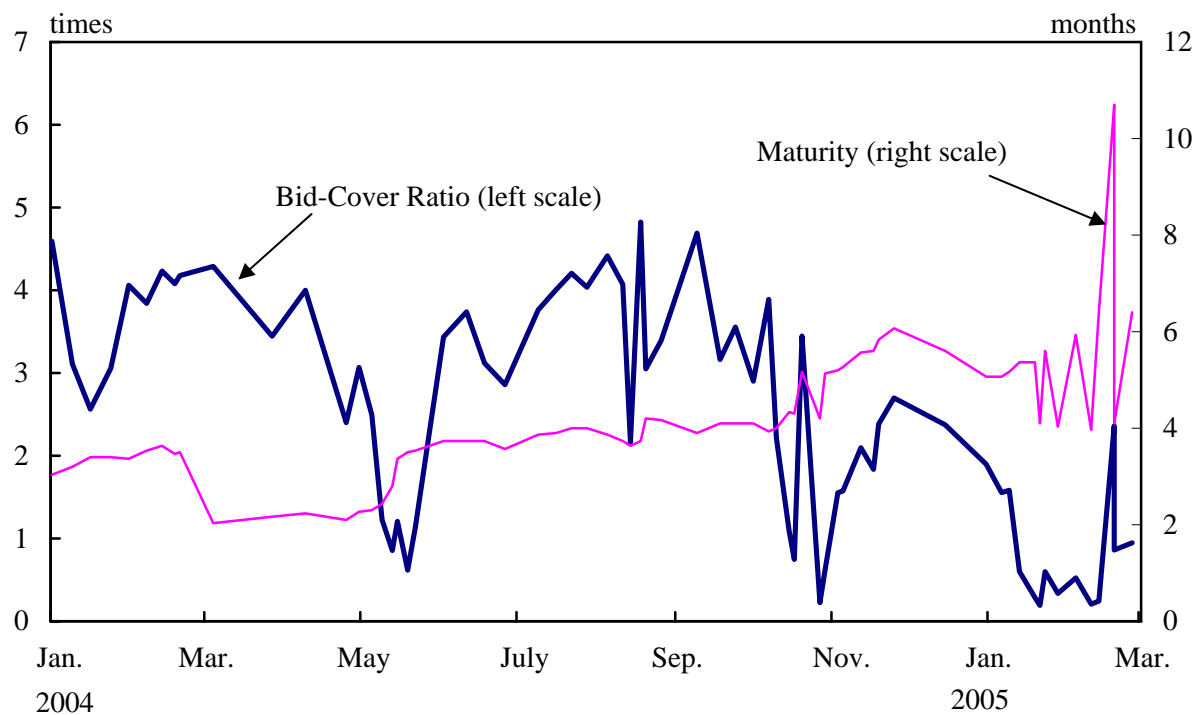


Note: "FBs" is the total of the FBs appearing under the "Sources of Changes in Current Account Balances at the Bank of Japan and Market Operations" (adjusted for the effect of TB/FB purchasing operations).

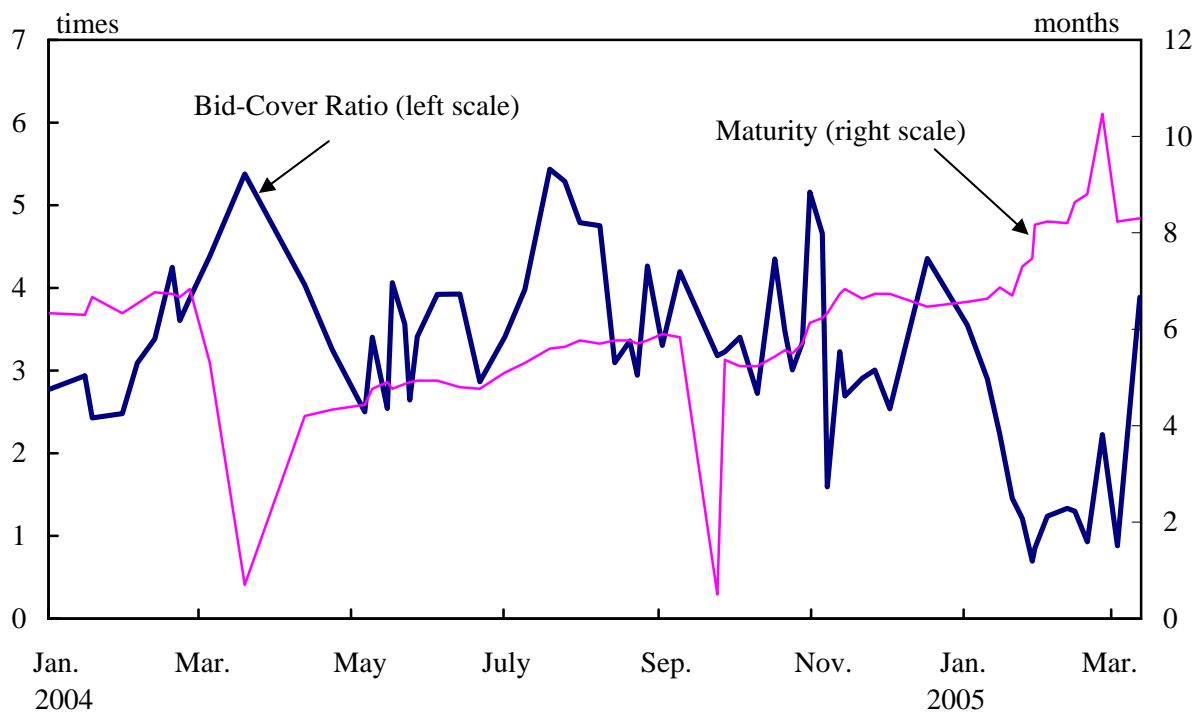
Sources: Ministry of Finance, "Status on the Implementation of Foreign Exchange Balancing Operations"; Bank of Japan, "Sources of Changes in Current Account Balances at the Bank of Japan and Market Operations."

[Chart 21] Results of Outright Purchases of Bills

**(1) Outright Purchases of Bills at Head Office**



**(2) Outright Purchases of Bills at All Offices**



Source: Bank of Japan.