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The Bank of Japan's Monetary Policy and Bank Risk Premiums in the Money Market

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Abstract

This short paper shows that under the Bank of Japan's Zero Interest Rate Policy and Quantitative Monetary Easing, not just the levels of money market rates but also the dispersion of rates across banks have fallen to near zero. Using the data on individual banks' Negotiable Certificate of Deposit rates, we first show that the dispersion of the rates among banks has fallen since 1999, the year of the adoption of the Zero Interest Rate Policy and reached almost zero by 2004. We next show that the fall in the dispersion of the rates is not explained by a corresponding fall in the dispersion of the credit ratings of the banks. Rather, credit risk premiums seem to have disappeared in the money market. We also discuss possible relationships between this result and the Bank of Japan's monetary policy.

Key Words: Monetary policy, Zero Interest Rate Policy, Quantitative Monetary Easing Policy, Negotiable Certificate of Deposit, Credit Risk Premium

JEL Classifications: E52

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I. Introduction

This paper analyzes the effects of the Bank of Japan's (BOJ) monetary policy during recent years, namely, the so-called zero interest rate policy (ZIRP) and quantitative monetary easing policy (QMEP)[1], on credit risk premiums demanded of Japanese banks in the money market.

There is a growing literature on the effectiveness of monetary policy near the zero lower bound on interest rates.[2] The literature mostly focuses on the effects of monetary policy on interest rates on safe assets such as government bills and bonds. An often neglected, yet significant aspect of the ZIRP and/or QMEP has been their effects on the credit risk premiums financial institutions pay in the market. That is, the BOJ's policy has lowered such risk premiums to extremely low levels, especially in the money market. As a result, not just the levels, but also the dispersion among banks of money market rates have been reduced to near zero. Such reductions in risk premiums have been significant in view of a sharp rise in premiums during the 1997-1998 credit/liquidity crunch, which seriously affected the overall economy.

This paper attempts to document such declines in the dispersion of risk premiums across banks. In doing so, we look at the market for negotiable certificates of deposits (NCD) where data on issuance rates of individual banks' NCDs are available. Using the data, we first show that the standard deviation of the NCD rates among the banks in our sample period rose sharply toward the financial crisis of 1997-1998, but has declined since then. In particular, it declined with the introduction of the ZIRP and declined further as the BOJ intensified its easy policy stance with the QMEP. We then show that the declines in risk premiums cannot be fully explained by recent improvements in the creditworthiness of the banks. This is suggestive of the role played by the BOJ's monetary policy.

In the next section, we present a brief description of the NCDs market in Japan. In section 3, we turn to the analysis of the movements of the standard deviation of the NCD rates over time. In section 4, we look more precisely at the relationship between the rates individual banks pay and the banks' ratings. We find that the relationship has become looser and looser. We discuss some possible interpretations of the results in section 5.

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[1] The ZIRP, the combination of a zero short term interest rate and a commitment to maintain it until deflationary concerns are dispelled, was adopted by the BOJ between April 1999 and August 2000. In March 2001, the BOJ introduced the QMEP framework whereby the operational target of policy was changed to the current account balances at the BOJ from the overnight call market rate and the BOJ promised to maintain the level of the balances well above required reserves until core CPI inflation became stably above zero. QMEP can be thought of as a version of ZIRP plus provision of reserves well in excess of levels necessary to achieve a zero short term interest rate. The QMEP framework is still in place at the time of the writing of this article.

[2] See, for example, Baba et al. [2005].

II. The Market for Negotiable Certificates of Deposit (NCDs)

(i) The amount outstanding of NCDs [3]

The amount outstanding of NCDs issued by Japanese banks (domestically licensed banks) has been hovering around 30 trillion yen recently (33 trillion yen as of the end of August 2004). Of this total, about 80 percent is issued by major banks, namely city banks and trust banks (based on fiscal 2003 averages). Major banks have recently raised around 30 percent of their total short term funding needs by issuing NCDs. Thus, NCDs are one of their principal instruments for raising operating funds (**Chart 1**).

(ii) NCD issuance by maturity

Looking at major banks' issuance of NCDs by maturity, issuances with maturities of less than 30 days account for about 60 percent of the total (again based on fiscal 2003 averages). Therefore, market liquidity for NCDs with maturities of less than 30 days is likely to be the highest of all the maturity zones (**Chart 2**).

III. The dispersion of interest rates on newly issued NCDs among major banks

Interest rates on major banks' newly issued NCDs had moved broadly in tandem since the first NCDs were issued in May 1979. That is, the rates had not reflected the differentials in credit risks of the banks. Since the late 1990s, however, the interest rates had started to reflect the credit risk of individual issuing banks, partly due to the rising concern over the stability of the financial system.[4] This is shown by substantial jumps in the degree of dispersion as measured by the standard deviation of the NCD interest rates in November 1997, when concern over the financial system instability heightened[5](**Chart 3**). The standard deviations declined significantly, however, after the adoption of the ZIRP and have fallen further following the adoption of the QMEP.[6]

It is worth noting that under the QMEP, the standard deviation of the interest rates on newly issued NCDs declined to or even below the levels observed in the period up to October 1997, during which investors rarely cared about differences in individual banks' credit risks.

A statistical test on the difference in the average standard deviations between the

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[3] For an outline of the NCD market in Japan, see Chapter 7 of *Totan Research* [2002].

[4] See *Totan Research* [2002].

[5] In November 1997, concern over the financial stability heightened following a series of failures of four financial institutions: Sanyo Securities (on November 3), Hokkaido Takushoku Bank (on November 17), Yamaichi Securities (on November 24), and Tokuyo City Bank (on November 26). The concern over the financial instability subsided after the nationalization of Long-Term Credit Bank of Japan (October 1998) and Nippon Credit Bank (December 1998).

[6] The same tendency is observed in fund-raising costs via deposits defined as payment of deposit interest rates divided by the amount outstanding of deposits.

periods of the ZIRP and QMEP rejected the null hypothesis that the average standard deviations during the two periods were equal at the 5 percent significance level for all maturities (less than 30 days, 60 days, and 90 days) [7] (**Chart 4**).

IV. Estimating Credit Curves from Interest Rates on newly issued NCDs

The interpretation of the preceding section's finding, declines in the standard deviation of NCD issuance rates among banks, is not straightforward. One possible interpretation is that financial strains have gradually eased since 1999 and the resultant improvements in the credit ratings of the banks have lowered the risk premiums for many banks and hence the standard deviation of the rates. In order to statistically address this issue, we estimate credit curves at various points in time.

(i) Estimation Method

First, we define the credit spread of a bank as the interest rate on NCDs newly issued by the bank with maturities of less than 30 days minus the weighted average of uncollateralized overnight call rate over all banks.[8] Then, we run time series-cross sectional regressions of the credit spreads on dummy variables corresponding to sample banks' credit ratings for each of four representative years under study; that is, i) 1997, the year of the financial crisis, ii) 1999, a year when the ZIRP was in full swing, iii) 2002, one year after the adoption of the QMEP, and iv) 2004, the last year of our sample period.[9] The data on NCD rates are available weekly, resulting in about 800-900 observations for each year.[10] Regressions also contain March, September and December dummies to control for seasonal market tightness toward year end and in annual/semi-annual book-closing months. Estimated credit spreads for each credit rating category, i.e., the coefficients on credit rating dummies along with the constant term, map out the "credit curve" for each of the four years.

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[7] According to a statistical test on the difference in the average standard deviations between the periods of the ZIRP and November 1997 -1999, the null hypothesis that "the average standard deviations during the two periods are equal" was not rejected at the 5 percent significance level for all maturities due to the large dispersion of interest rates during the period.

[8] Our sample consists of city and trust banks.

[9] Data on NCDs with maturities of less than 30 days were used since NCDs in this maturity category have the largest share, possibly resulting in the highest market liquidity. Similar regressions using the data on NCDs in other maturity categories, namely less than 60 days and less than 90 days, yielded less robust estimation results.

[10] The number of observations for later years is smaller for two reasons. First, there have been mergers among banks. Second, some banks were not able to issue NCDs in later years and are not in the sample, because their ratings fell below the investment grades.

(ii) Estimation result

The estimation result is shown in **Chart 5**. Dummy variables for credit ratings are statistically significant for almost all cases. **Chart 6** draws the credit curves implied by the estimation result. The credit curves slope upward for ratings of A2 or lower. It is sloped downward between A1 and A2 for 1999. The number of banks with a rating of A1 or higher, however, is very limited for 1999. Thus, it seems that we do not have to take this part of the result too seriously. After all, the coefficient on A1 dummy is insignificant for 1999.

Chart 6 also demonstrates how the slope of the credit curve became flatter over time. A notable exception is the movement of the spread at Baa2 rating between 1997 and 1999. This coefficient, however, is insignificant even at the 5% level in 1999. Besides this, it seems fair to say that the credit curve flattened after the introduction of the ZIRP in 1999, and flattened further following the introduction of the QMEP in 2002, before it flattened out in 2004.[11]

The estimation result indicates that the credit risk premiums among major banks are currently close to zero, and that the differences in credit ratings among them are now hardly reflected in their fund-raising costs in the money market. Therefore, the narrower dispersion of fund-raising costs among banks, shown in **Chart 3**, has been a result of declines in risk premiums across the board in the money market, rather than by a lower dispersion of credit ratings among major banks.

It should be noted that the possibility remains that the reduction in the credit risk premium as discussed above has been caused by the government's policy of "protecting all bank debts." The following observations seem to suggest that this factor does not go as far as explaining all the reductions in the risk premiums in the money market after 1999. First, the government policy mentioned above had already been made public in November 1997 in a joint statement by the Minister of Finance and the Governor of the BOJ. Second, even after the release of the statement, credit risk premiums moved up and down in the money markets as shown in Chart 3. Third, as is widely known, until recently there remained the dispersion of credit risk premiums in the markets for bank debt instruments with relatively long maturities, such as bank debentures, subordinated debt, as well as credit default swaps. Such a line of

[11] For the 2004 credit curve, we statistically tested for differences in credit risk premiums between credit ratings. The null hypothesis that "the credit risk premiums are the same" was not rejected between the A2 and Baa2 ratings at the 5 percent significance level, although the null hypothesis between the A2 and Baa1 ratings was rejected. This result shows that the credit curve became completely flat between the A2 and Baa1 ratings. We also tested for differences in credit risk premiums between 1997 and 2004 for the same credit ratings, and found that the null hypothesis that "the credit risk premiums are the same" was rejected for all credit ratings. For the difference between 2002 and 2004, however, the same null hypothesis was not rejected for all credit ratings except A2. This result statistically supports the flattening of the credit curve under the QMEP.

consideration suggests an important role played by monetary policy in reducing risk premiums in the money market, to which we now turn.

V. Discussion

In this section, we discuss a potential role the BOJ's monetary policy since 1999 has played in reducing risk premiums in the money market. Under the ZIRP, the BOJ targeted approximately a zero overnight call market rate. The target was the average of all overnight rates banks paid in the call market. Thus, the standard deviation of the overnight rates also had to decline to near zero. Otherwise, the average rate could not have been zero. This means that the BOJ's ample supply of liquidity reduced risk premiums to virtually zero at the overnight horizon. One might argue that the BOJ's promise to maintain a zero interest rate until deflationary concerns are dispelled played a role here. With this promise market participants were assured of a zero interest rate/ample liquidity supply not just today but also in the near future. This seems to have reduced, if not completely eliminated, credit risk premiums at the short end of the money market.

The current paper has, however, gone beyond this and showed that the standard deviation of rates of longer dated maturities also fell to near zero. Let us note that the promise to keep a zero interest rate until deflationary concerns are over (as under the ZIRP) or until CPI inflation is positive (as under the QMEP) does not necessarily guarantee a zero interest rate at all maturities in the money market. There is always a risk of inflation moving up to positive territory, say, within a year.

There seem to be two possible explanations of the near zero dispersion of term rates across banks since 1999. First, the BOJ has successively strengthened its commitment to maintain a zero rate during this period. Initially, the ZIRP was adopted. Under the QMEP, the commitment was clarified to read until "core CPI inflation is stably above zero." In October 2003, it was strengthened further to the maintenance of a zero interest rate at least until (roughly) actual and expected core CPI inflation are above zero. The stronger promises may have lowered both the level and dispersion of term rates.

The second explanation would emphasize the effects of the BOJ's fund supplying operations on money market rates. As the BOJ raised the target on the current account balances under the QMEP, it increasingly had to rely on operations with longer maturities. In April and May of 2001, the BOJ's fund-supplying money market operations had maturities of one to three months. In March 2005, some operations had a maturity of 11months. As many banks raised funds through these operations, the levels and dispersion of term rates seem to have declined. Needless to say, the BOJ's operations have been done either in a repo manner (repurchase

agreements) or by purchasing TBs and FBs in an outright manner. Thus, the term rates that have been directly affected by the operations are collateralized interbank rates or TB/FB rates. The effects on such rates then seem to have spilled over into uncollateralized money markets including the NCD market. On this view, the large BOJ operations with long maturities have had the effect of reducing risk premiums in the money market.

Estimating the exact contribution of each of these two factors to the reduction of the dispersion of money market rates is left for future study. At this point, it seems fair to say that both have contributed significantly.[12]

The stagnation of the economy, especially after 1997, has been characterized by serious strains in the financial system that weighed more heavily on less healthy banks. Thus, the BOJ's policy seems to have supported the economy not just through low interest rates but also by lowering liquidity/credit risk premiums banks pay in the money market.

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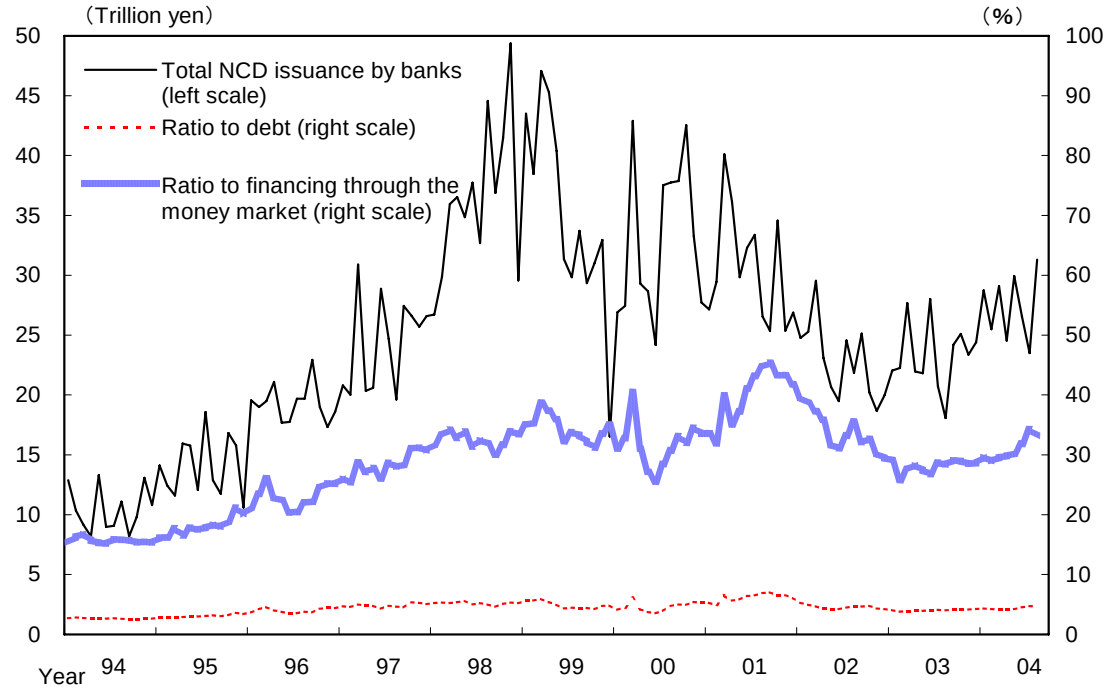
Totan Research [2002], *Shin Tokyo Money Market* (in Japanese).

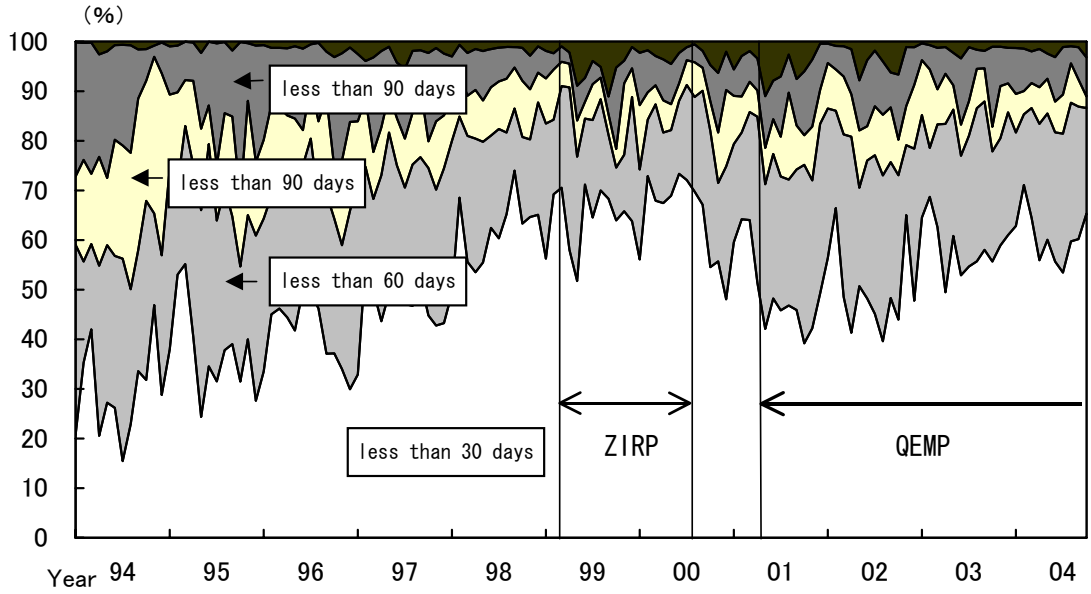
[12] A related point is whether or not the BOJ's purchases of long-term government bonds have had direct effects on long-term interest rates. See, for example Oda and Ueda [2005] in this regard.

(Chart 1) Total NCD Issuance by Banks and Its Ratio to Total Financing



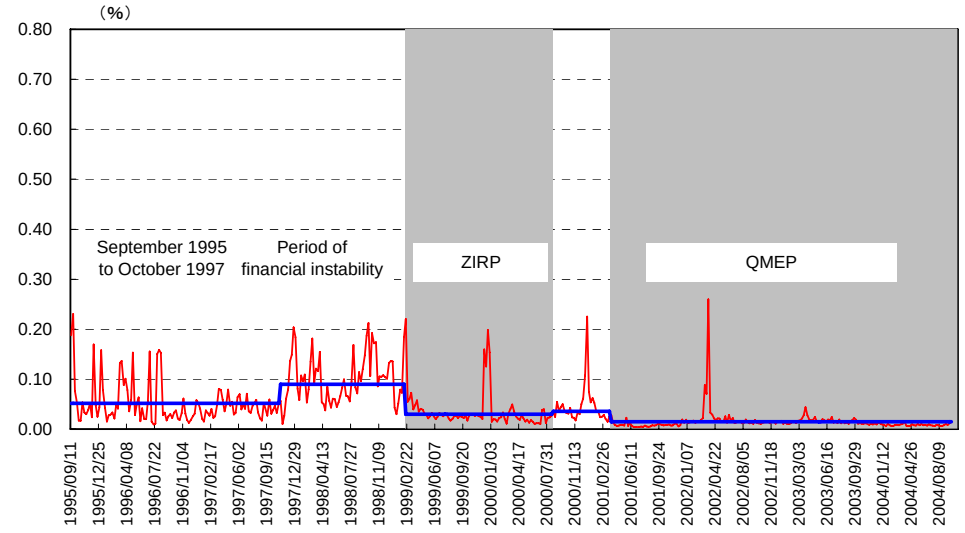
Note: Ratios are calculated based on the banking accounts of domestically licensed banks. "Financing through the money market" refers to the total funds raised through call money, NCDs, bank debentures, corporate bonds, CP, and repurchase agreements.

(Chart 2) NCD issuances by maturity

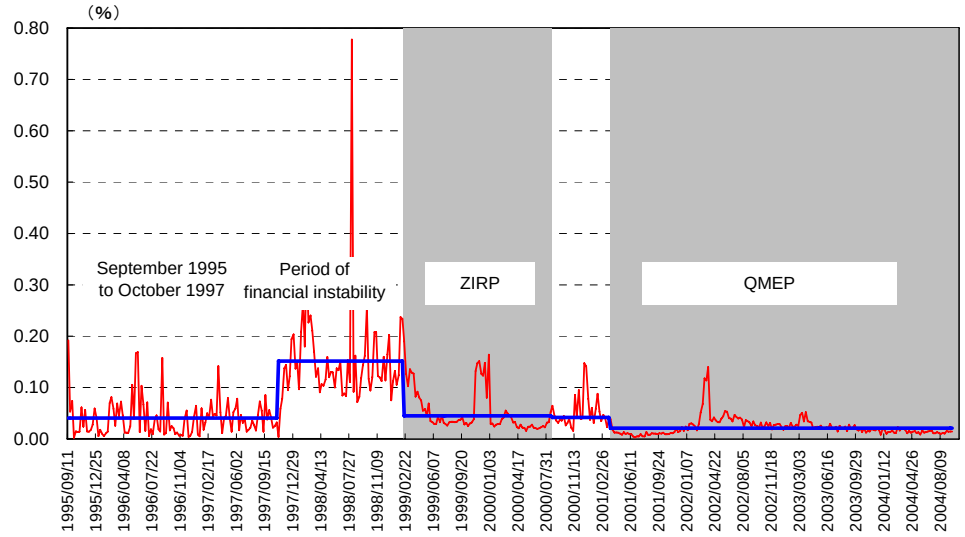


(Chart 3) Dispersion of Interest Rates on Newly Issued NCDs among major banks

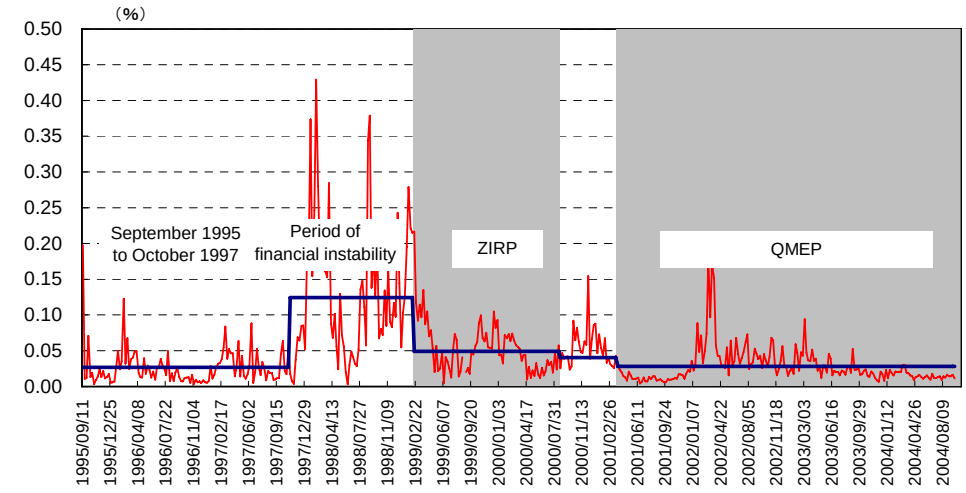
(Less than 30 days)



(Less than 60 days)



(Less than 90 days)



Notes:

1. The above data are for the following major city banks, long-term credit banks, and trust banks for which weekly data are available since September: Sumitomo Mitsui Banking Corporation, the Bank of Tokyo-Mitsubishi, UFJ Bank, Resona Bank, Shinsei Bank, Aozora Bank, the Mitsubishi Trust and Banking Corporation, the Sumitomo Trust & Banking, Mizuho Trust & Banking, UFJ Trust Bank, and the Chuo Mitsui Trust and Banking Company. Data for Fuji Bank and Mizuho Bank are excluded, as a large portion of their NCDs were issued to local governments. For Sumitomo Mitsui Banking Corporation prior to its merger, data for the former Sumitomo Bank are used.

2. The following periods are considered to be "event periods" and data for these periods are excluded from the calculation: (i) the end of 1999 (Y2K problem); (ii) the end of 2000 (preparation for the introduction of Real Time Gross Settlement; (iii) the end of fiscal 2001 (the partial removal of blanket deposit insurance). When there are missing data for a given bank in a calculation period, that bank is excluded from the calculation.

(Chart4） Test of the difference on dispersion of NCD interest rates

	Mean of standard deviation under the ZIRP(A)	Mean of standard deviation under the QMEP(B)	Difference （C=B-A)	p-value Null hypothesis (C=0)
Less than 30 days	0.02970	0.01457	-0.01512	0.000
Less than 60 days	0.04494	0.02071	-0.02423	0.000
Less than 90 days	0.04907	0.02814	-0.02093	0.000

(Chart 5) Estimation Results

	Y1997	Y1999	Y2002	Y2004
Constant term	-0.075	0.156		0.034
Aa2	0.105			
Aa3	0.082			
A1	0.116	-0.047		
A2	0.113	-0.122	0.006	-0.023
A3	0.139	-0.126	0.014	-0.023
Baa1	0.126	-0.117	0.030	-0.021
Baa2	0.119	-0.081	0.034	-0.014
Baa3	0.194	-0.088	0.043	-0.009
Maturity beyond year-end	0.493	0.191	-0.002	
Maturity beyond semi-annual book-closings	0.025	-0.031	-0.006	0.004
Maturity beyond fiscal year-end	0.030	0.038	0.087	0.003
Adj_R^2	0.658	0.253	0.296	0.482
Number of observations	865	826	667	556
Number of banks	18	17	13	13
Aa2	52	0	0	0
Aa3	52	0	0	0
A1	80	8	0	0
A2	128	78	52	60
A3	52	72	202	189
Baa1	227	252	109	178
Baa2	104	262	155	38
Baa3	155	149	149	48
No rating	15	5	0	43

Note: Green, yellow, and blue shadows indicate significance level at the 1%, 5%, and 10%, respectively.

(Chart 6) Credit Curves