

“Did Mergers Help Japanese Mega-Banks Avoid Failures? Analysis of the Distance to Default of Banks”^{} ^{**}**

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Kimie Harada and Takatoshi Ito

Abstract

In the 1990s, several large Japanese banks failed for the first time in its postwar history. As financial environment was deteriorating further, several remaining banks decided to merge among themselves, presumably, to make their operations more efficient and to avoid failures. This paper defines, measures and analyzes the distance to default (DD), a concept in corporate finance, of Japanese large banks, in order to answer a question whether mergers in the late 1990s and 2000s made the merged banks financially more robust. The novelty of the paper is to develop a method of the DD for banks that experience a merger, and to apply the method to the Japanese banking data. Our findings include: (1) financial soundness of a merged bank depended heavily on that of the pre-merged banks. Merger did not seem to add a special value to financial health. A merger of sound (unsound) banks produced a sound (unsound, respectively) merged financial institution; and (2) Not only merger itself did not improve the DD of the pre-merged banks, but a merged bank often experienced the negative DD right after the merger. The findings are consistent with a view that merger was not intended to enhance bank operations, but to take advantage of the perceived too-big-to-fail policy. Another interpretation is that mergers with intention of enhancing efficiency resulted in failed implementation of true operational efficiency—quick integration of computer operation systems and duplicating branch networks.

Keywords: distance to default, bank merger, and financial holding companies
JEL Classification: G19, G21.

1. Introduction

The Japanese banking sector went through tumultuous years beginning in the early 1990s , with the burst bubble, to 1997, followed by another crisis in 2003. It is only since 2005 that Japanese financial institutions have regained financial strength, and the risk of systemic failure has receded. During the difficult years between 1997 and 2003, many banks attempted several methods to enhance their capital bases, as capital was constantly eroded by losses from nonperforming loans (NPLs) and declining stock prices. One way that began to enhance capital was a merger that took advantage of operational synergy and scale economies. In fact, mergers of very large banks took place, most likely to avert failures due to a lack of capital.

Sumitomo Bank and Sakura Bank (formerly known as Mitsui Bank) announced a merger on April 1, 2001. This was quite significant because the two banks were, respectively, the core member of the traditional enterprise groups (descendants of prewar *zaibatsu* conglomerates). On August 20, 1999 Fuji, DKB, and IBJ announced a three way merger and a reorganization plan to create a financial group with specialized subsidiary organizations, commercial banking, investment banking, and trust banking. Sanwa and Tokai Banks, each having regional strength, announced their merger on March 14 2000. These mergers can be regarded as a direct response by these banks to the banking crisis of 1997-98.

After several years of seemingly tranquil conditions, another financial crisis struck in 2002-03 when the bank regulator tightened standards in assessing and classifying nonperforming loans and the use of deferred tax assets as part of capital, and introduced a requirement for reserves for NPLs. The effects of such regulatory tightening proved dire for many banks. In May 2003, for example, Resona Bank failed and was subsequently taken over by the government due to insufficient capital. In fact,

many banks showed huge deficits following the regulatory tightening.

It was only after 2005 that the Japanese banks regained financial profitability and strength. Major financial groups in the Japanese banking sector posted positive net profits for the accounting years of 2005 to 2007 and they have completed repaying government injected funds that flowed into the predecessors of financial groups in 1998 and 1999. The capital adequacy ratio has improved far above 8%, and the NPL ratio is now lower than 5%.

Traditionally, the government policy separated financial service industries into specialized segments and did not allow financial consolidation across segmentation. Commercial banking, trust banking, long-term credit banking, securities, and insurance had to be operated separately and independently. The Antimonopoly Law of 1949 prohibited financial holding companies as well as general holding companies for five decades then it was revised in 1997. The revised Antimonopoly Law and the Banking Law of 1981 opened the way for full financial integration across financial segments by allowing financial holding companies (FHCs) to become a parent of different financial institutions.¹ All major Japanese banks are now under these FHCs and they are listed on market and report consolidated financial statements. Due to consolidations sometimes across the segmentation boundary, most banks' balance sheets are not directly comparable before and after their mergers or consolidations. Our analysis carefully examines the comparable balance sheets.

The primary motives for a merger of financial institutions are identified as cost savings and revenue enhancements. According to the Group of Ten (2001) report,

¹ Under the new Article 9 of the Antimonopoly law, the establishment and operation of a holding company is permitted. Along with the amendment of the Banking Law in 1998, Japanese banks could establish holding companies and become subsidiaries of them. Most holding companies in the banking sector then changed into financial holdings.

the most important forces encouraging consolidation are improvement in information technology, financial deregulation, globalization of markets, and increased shareholder pressure for financial performance. That is, consolidations were part of strategic management and then improvement in competitiveness and policy implications were analyzed by academics. Calomiris and Karceski (1998) and Calomiris (1999) survey earlier study of bank consolidations and categorized the literature based on type of the research.

As Ito and Harada (2005, 2006) examined, market evaluations of Japanese banks in the 1990s were low. Their stock prices fell more than the market average, and the so-called Japan premium emerged after 1997. However even after their mergers, evaluations in the markets did not improve, and low evaluations prompted some to question whether mergers have made Japanese banks healthier, and whether their efficiency has improved.

Several papers have suggested that the Japanese banks merged in order to rescue weaker banks, but only a few have quantitatively evaluated the effect of mergers. Traditional methods of examining the effectiveness of mergers, such as comparing the before-and-after cost ratios, per-employee profits, or profit-capital ratios does not produce definite results until enough post-merger data has been compiled. Also the analysis would be backward-looking at the same time. Another method of evaluating effectiveness of mergers is to compare stock prices of merged banks. The stock prices reflect market expectations of future performances so comparing their prices before and after the merger may be a good way to make assessments. However, due to their mergers, most banks are not comparable before and after these mergers. For example, the before-merger stock price and after-merger

stock price have different units. So items in financial statements changed due to mergers and unreported intra-group transactions making analyzing subsidiaries (financial institutions under the parent) difficult. Additionally, merger accounting employed in Japan differed from that used in other countries. The purchase method is standard, but most mergers in Japan are dealt by using with the pooling-of-interests method.²

To overcome the difficulties mentioned above, the concept of the distance to default (DD) is used to calculate and analyze the Japanese banking sector before and after the mergers. The DD in the paper is a structural approach which is based on Merton (1977)'s model and Black and Scholes (1973) option pricing model.

As shown in the DD analysis, our main findings were that mergers of Japanese banks did not make them financially healthier. This result confirms the suspicions that Japanese banks did not become healthy after their mergers. Adding two weak banks would not produce a strong bank.

The rest of the paper is structured as follows. Section 2 reviews the Japanese banking sector performance over the past 15 years. Section 3 describes the DD methodology and reviews the DD application to banks. We create hypothetical merged balance sheets and stock prices before the merger in section 4 and compare the DD before and after the mergers. The empirical results are also presented in section 4. Section 5 concludes.

² There are two methods for reporting for financial statement of mergers: the pooling-of-interest method and the purchase accounting method. Under the pooling-of-interest method, the balance sheets of a company in the merger are simply added together with the book values of their net assets without indicating which entity was the "purchaser" and which was the "purchased". When this method is used, it becomes difficult to tell who is buying whom or to determine how to evaluate the transactions. With the purchase method, one company is identified as the buyer. The buyer records the assets of the company being acquired on its books at the price it actually paid.

2. The Japanese banking sector performance, 1990-2005

This section reviews the history of bank failures and consolidations in Japan for the period between 1990 and 2005, as well as the literature on the performance of Japanese banks. Japanese stock prices and land prices tripled and quadrupled in the second half of the 1980s. The stock price index peaked at the end of 1989, and land prices peaked late in 1990 to mid-1991. They then plummeted from 1990 to 1992. No one knew at the time that this declining trend would continue until 2003.

Due to the bursting of the bubble and declining stock prices in the first half of the 1990s, mounting NPLs siphoned away bank profit. Actual losses and prospective losses in terms of reserves cut into bank capital for the majority of Japanese banks. According to the BIS capital adequacy standard, banks had to maintain a capital ratio of 8% to the risk-adjusted asset. In November 1997, the Hokkaido Takushoku Bank (Takugin), one of the big twenty banks, failed. In the same month, one of the big four securities firms, Yamaichi Securities, also failed after the revelation of large unreported losses. In March 1998, the government injected public funds to help raise capital adequacy ratios of major banks.

Despite the efforts to stabilize the financial system, two large banks were found to be under-capitalized and were nationalized in 1998. More public funds were injected as preferred stocks in March 1999. These developments sent an unmistakable signal to surviving banks that a lack of capital may result in instant failure, brought about by either the market or the regulator. Large banks attempted various ways to increase capital. Under such circumstances, a financially weak bank with less than sufficient capital can seek to merge with a stronger bank with a sufficient capital buffer. The merged bank may take advantage of scale economies in operation, cutting

down costs. Expecting higher net earnings of the future, the stock market may favorably price the stock of a merged bank immediately after the merger (or so the bank hoped). However, Hirota and Tsutsui (1999) find interesting implications for economies of scale. They examine the risk-cost hypothesis of Japanese banks and find the estimates of scale elasticities become smaller, that means Japanese large banks, before mergers, had already exploited the gain from the scale of economies. Mergers up to 1994 are covered in the paper.

The difficulties among Japanese banks have been analyzed in many papers, but few papers are focusing on recent mega-mergers with formal empirical analysis. Ito and Sasaki (2002) analyzed how Japanese banks reacted to a falling capital ratio in the first half of the 1990s. They showed that the banks with a lower capital ratio tended to issue more subordinated debts to increase their capital ratio and made commercial loans less than in the past. One important footnote is that until 2002, the announced capital ratio did not show the true capital ratio. The discrepancy was due to optimistic classifications of NPLs. For example, insufficient reserves toward problem loans, use of subordinated debts, and the use of tax deferred asset. In one instance, the Long-term Credit Bank of Japan failed in September 1998, despite its strong capital ratio, above 11%, in March 1998.

Several papers are worth mentioning due to their input concerning the Japanese banking sector during the long stagnation and financial crises. Hoshi and Kashyap (2001) painted a bleak picture of the relationship between Japanese banks and corporations from the corporate governance point of view. Chapters in Cargill, Hutchison, and Ito (1997, 2000) give detailed descriptions of the earlier stages of Japanese banking failures. Hoshi and Ito (2004) review the evolution of the regulatory

system in Japan from 1998 to 2004. Sakuragawa and Watanabe (2007) evaluated the Takenaka reform of 2002, which is usually credited for the revival of the Japanese banking sector after 2003.

Credit Default Swaps (CDS) premiums for Japanese banks can be a new criterion in addition to the Japan premium, the nonperforming loans ratio, and the capital adequacy ratio. Papers analyzing Japanese banks with CDS are Ito and Harada (2005, 2006), Ueno and Baba (2006) and Okada (2007). Ueno and Baba (2006) estimate the default intensity using CDS and find that the default intensities for the banks and the government substantially rose in the late 1990s. Okada (2007) uses an event study approach to study the reaction of the CDS market and finds that banks in general became less efficient after mergers. Ito and Harada (2005, 2006) examine several market figures such as stock price, interbank premiums and CDS, and find that interbank premiums do not reflect the soundness of Japanese banks and CDS is an alternative measure to see the market participants' view.

However, CDS is not traded for companies which are already in bad shape. Government affiliated companies and relatively small size companies are not traded in CDS market. With the DD measure, we can evaluate those banks which are government affiliated and which are not traded in CDS market. The DD is employed as a measure of bank risk because the DD is a comprehensive measure of default risk (See Gropp and Moerman(2004), De Nicolo and Tieman (2005) and Gropp, Lo Duca and Vasala (2006)).

Banking failures and mergers and acquisition are relatively new phenomena in Japan. The first case of a bank failure that prompted assistance from the Deposit Insurance Cooperation of Japan was Toho Sogo Bank in 1991. The first *listed* bank failure was Hyogo Bank on August 30, 1995. Since then, many banks including some

major banks failed, some of which were merged with healthier banks and some of which were nationalized. Harada and Ito (2008) created a list noting these failed banks.

Among surviving banks, mergers were a popular step toward restructuring and capital strengthening. In the following years large banks opted for creating a holding company structure. As examined in Harada and Ito (2008), major banks went through complicated mergers and reorganizations in a short period of time. This requires whoever analyses the balance sheets of pre-merger banks ensures data properly corresponds to the balance sheets of the merged banks.

Earlier studies of bank mergers in Japan such as Tachibanaki and Haneda (1999) typically relied on profitability and cost indicators before and after the mergers. However, those analyses need information covering a long span of time and the evaluation of mergers is looking backwards. Hosono, Sakai, and Tsuru (2007) explored the causes and consequences of Japanese banking consolidation mainly what took place in the 1990s. They examine major banks, regional banks and shinkin banks. Regional banks are classified into first-tier regional banks and second-tier regional banks, which are not usually listed. Shinkin banks are also unlisted banks so they mainly use financial statement data. As we mentioned, the credibility of financial statements of merged banks are sometimes questioned. Further, financial statements data are not issued frequently and they have a significant time lag. In this paper, we overcome the shortcomings of earlier studies by using information derived from market prices (which are more accurate, frequent and timely than that derived from other sources). A method, the distance to default, is used in analyzing Japanese banks and evaluated bank performance comprehensively.

The DD is well known as a market-based measure for assessing the default

or credit risk of a non-financial corporation and it is gradually developing to apply financial institutions also. The DD has not been used in analyzing bank mergers, however, it is mainly used by international organizations and financial authorities to assess the financial stability and to monitor the risk of financial institutions. For example, ECB (2005) treats the DD as an important forward-looking indicator that can provide early signs of financial fragility. In the case of cross-border contagion, the DD can be used as a comprehensive measure of default risk (Gropp, Lo-Duca and Vesala (2006), De Nicolo and Tieman (2006)). Chan-Lau and Amadou (2006) introduce the concept of distance to capital that accounts for pre-default regulatory actions such as prompt-corrective-actions framework. The distance to insolvency measures are introduced and applied by Danmarks National Bank (2004). The DD is the base from which these new measures were derived and it is applied for analyzing various risks such as contagion risk (Duggar and Mitra (2006) and Chan-Lau, Mitra and Ong (2007)). Chan-Lau and Amadou (2006) use a case study approach for two Japanese banks (Resona and Ashikaga Banks) to explain two different measures, the distance to default and the distance to capital.

As we stated, major mergers by city banks to survive took place in the early 2000s. These mergers are indirectly related to changes in supervisory environment. The Financial Rehabilitation Program was released by Takenaka, the Minister of the Financial Services Agency, in October 2002 and it urged major banks to apply stricter accounting standards and to reduce the NPL share by a half. The government was on the one hand helping the bank with capital injection, on the other hand forcing to ensure thorough information disclosure and preparing a scheme to temporarily take over temporarily even a large bank. Changes in supervisory environment and regulatory framework are examined in literature such as Hoshi and Patrick (2000), and

Cargill, Hutchison, and Ito (1997).

3. Application of the DD to banks

Our main goal is to calculate the distance to default (DD) in order to evaluate bank mergers. An interesting question is whether a merged bank will bear the characteristic of a financially better bank, a worse bank, or an average. We attempt to answer this question by examining the DD of the predecessor banks and the merged bank. We are not interested in explaining the default correlation of predecessor banks nor calculating the joint default probabilities. As an example, when there are predecessor banks, three DDs are calculated in order to examine how fragile the predecessors are individually and not to examine the likelihood that the three banks will default simultaneously. We would like to prove the DD can show a merger of unhealthy banks does not produce a healthy bank..

In this paper, we employ a structural model of credit risk assessment pioneered by Merton (1974) and Black and Scholes (1973) option pricing theory. The model defines a default when the book value of liabilities of a company is below the market value of assets. The point where the book value of liabilities of a company is just equal to the market value of assets is called default point. The DD is the number of standard deviations away from the default point. The larger the DD, the greater the distance of a company from the default point, less the risk or probability of default.

The option pricing theory determines the asset value and its volatility of a company from the observed stock price and stock volatility. Specifically, the level and the volatility of assets are calculated with the Black and Scholes (1973) model using the value and volatility of stocks. Once the asset market value and its volatility are known, it is possible to calculate the probability that the asset value declines to the

default point within a specified time. This probability is the default probability that corresponds one to one with the DD.

We use the DD rather than default probability in order to see merger effect. It is equivalent to use default probability, however we use the DD as used in related literature. The DD tells us by how many standard deviations the asset value deviates from the default point. Having the same level of the DD means that the two companies are at the same distance from its default point respectively and have the same level of default risks. Thus, companies having the same scale measured by the DD have the same risks. Correlation between default risk and the DD is that one indicator becomes bigger whilst the other one becomes smaller. This negative correlation applies to the relation between default probability and the DD as well. Since the DD is a market based measure of distress, it contains expectations of market participants and it is forward looking. Gropp, Vesala and Giuseppe (2006) argue that the DD may be a particularly suitable and all-encompassing measure of default risk for banks.

The DD is defined as follows:

$$DD_t = \frac{\log\left(\frac{V_t}{L_t}\right) + \left(\mu_A - \frac{1}{2}\sigma_A^2\right)T}{\sigma_A\sqrt{T}} \quad (1)$$

where V_t is the market value of the bank's assets at time t , L_t is the bank's liability at time t , μ_A is the mean growth rate of V_t , σ_A is the standard deviation of μ_A , T is a time horizon, that is the time until default occurs which is set to one year. This one year assumption is the common assumption without particular information about the maturity structure of liabilities. V_t follows a geometric Brownian motion which is essential assumption. If L_t does not change until $t+T$ (i.e. $L_t = L_{t+T}$), we can interpret the numerator of DD_t as $E_t(\log V_{t+T} - \log L_{t+T})$. This is because V

follows a geometric Brownian motion which has (non-zero) mean and variance, and $\log V_{t+T}$ is modeled as logarithmic normal distribution and distributed as

$$N\left(\log V_t + \left(\mu_A - \frac{1}{2}\sigma_A^2\right)T, \sigma^2 T\right).^3$$

The DD is also expressed as follows:

$$DD_t = \frac{E_t \log(V_{t+T}) - \log L_{t+T}}{std(\log(V_{t+T}))} \quad (2)$$

where $std(\)$ is standard deviation. Hence, DD_t and the default probabilities of the structural model correspond to each other one for one. These assumptions and modeling tell us that a negative DD implies $E_t(\log V_{t+T}) < \log L_{t+T}$. As the market value of the assets follows logarithmic normal distribution, the negative DD means that a probability of default $(V_{t+T} < L_{t+T})$ at time $t+T$ is greater than 0.5.

DD_t is calculated using the data as follows; L_t is from the bank's balance sheet and set T equal to one year. We need Black and Scholes option price model to estimate V_t, μ_A , and σ_A .

$$W_t = V_t \Phi(d_1) - L_t e^{-rT} \Phi(d_2) \quad (3)$$

$$\sigma_A = std(\ln(V_t) - \ln(V_{t-1})) \quad (4)$$

where

³ $E_t(\log V_{t+T} - \log L_{t+T})$ is derived as follows;

$$\begin{aligned} E_t(\log V_{t+T} - \log L_{t+T}) &= E_t(\log V_{t+T} - \log L_t) \\ &= \log V_t + \left(\mu_A - \frac{1}{2}\sigma_A^2\right)T - \log L_t \\ &= \log\left(\frac{V_t}{L_t}\right) + \left(\mu_A - \frac{1}{2}\sigma_A^2\right)T \end{aligned}$$

$$d_1 = \frac{\log\left(\frac{V_t}{L_t}\right) + \left(r + \frac{1}{2}\sigma_A^2\right)T}{\sigma_A\sqrt{T}} \quad (5)$$

$$d_2 = d_1 - \sigma_A\sqrt{T} \quad (6)$$

Here, r is a risk-free rate, W_t is the market value of equity at time t (stock prices times number of shares outstanding), Φ is the standard normal cumulative distribution function. In order to estimate V_t, μ_A , and σ_A , we use the following steps with the gradient method. First, we set the initial guess for $V_t^0, V_{t-1}^0, V_{t-T+1}^0$ (previous year's data), then calculate σ_A^0 , using equation (4). We next calculate $V_t^1, V_{t-1}^1, V_{t-T+1}^1$ with σ_A^0 . Then we calculate σ_A^1 , using equation (4) and $V_t^2, V_{t-1}^2, V_{t-T+1}^2$ with σ_A^1 . These procedures are repeated until the values converge. By doing these,, we have V_t, μ_A , and σ_A .

In computing the DD of a bank, the face value of near-term and long-term debts (financial statements) and market prices of the bank's stock are needed. The banking sector, however, has a unique balance-sheet structure and is different from those companies in the non-financial sector. We particularly take into consideration industry-specific variables to classify what can be short-term debt and long-term debts of banks (See **Appendix table 1**). Items are in principle selected in terms of their maturity. Nevertheless care is needed. For example, even the term deposits (of maturity more than a year) can be withdrawn if depositors forego part of accrued interest, so it could become short-term debt in the case of a bank run.⁴ We have to make several judgments in defining short-term debts by examining each item.

Some new measures such as the distance-to-capital (Chan-Lau and Sy (2006))

⁴ Interim (a minor of the semi-annual) financial statements of Japanese companies do not contain detailed sub-items of time deposits and it is impossible to treat total debt minus time

and the distance-to-insolvency (Danmark National Bank (2004)) are derived as an alternative to the DD for analyzing the banking sector. In the banking sector, prompt-corrective-action frameworks are implemented and weak banks are prone to default. The distance-to-capital measure takes into consideration this framework. The distance-to-insolvency, on the other hand, considers capital-adequacy requirement. As banks can be sustained without falling below the statutory capital-adequacy requirement, the distance-to-insolvency measure shows the market's assessment of the probability that the bank observes the capital requirement. We use the DD instead of these measures as the DD is basic and widely used measure of credit risk assessment.

The figure of the DD can be interpreted as the distance to default in terms of standard deviation of asset value fluctuation. For example, a DD of 2.0 means that the default within a year is a two-standard deviation event presuming the fluctuation of mark-to-market asset values follows the recent historical value, using the current mark-to-market asset value as a starting point. Even if the DD becomes zero, it does not mean that the bank fails at that point of time. If short-term debts (liabilities with maturity less than a year) are not rolled over, then the bank or the company would need to exhaust assets in order to repay within a year. The DD being 0.0 or even negative means that the bank will be highly likely to fail unless the asset value improves. However, if the short-term debts are rolled over, then it survives on the cash flow basis, although it is technically insolvent. While if short-term debts are called (time deposits withdrawn in a bank run), then it may fail at once. If and when the DD of a bank approaches zero, it implies the bank is in an extremely vulnerable position..In the event of a bank run, suddden death may be certain.

For Japanese banks, what makes analysis difficult, apart from the DD, is that

deposits as short-term debt.

financial holding companies (FHCs) have been created and chosen the pooling-of-interests method for their merger accounting method. The system of creating FHCs is a new scheme introduced in 1997 in Japan and data to analyze FHCs is not yet accumulated, since most FHCs are still in the early stages of establishment. The pooling-of-interests method which unites the book value of assets and the book value of liabilities is no longer used as merger accounting method outside Japan.⁵ However, the method is accepted and used by banks in Japan, making it difficult to measure the market value of their mergers.

Our analysis of the DD tries to overcome the discontinuity in the data and takes into consideration market evaluation. We provide a picture of how banks and FHCs performed in terms of financial health before and after mergers with the DD.

4. The DD of Japanese banks

4.1 Data

Annual balance sheet, income statement, daily stock prices and the number of issued stocks for each bank are obtained from the Nikkei Financial Quest database. Our data covers the period of fiscal year 1985 to August 2005. Most mergers took place around 2000 so that the after-merger period is limited, although our data can describe how the DD of major banks behaved over two decades.⁶

In order to calculate the DD, data on the risk free rate, market capitalization,

⁵ As a part of convergence in the account

⁶ In our sample, Mitsubishi Tokyo Financial Group (MTFG) and UFJ Holdings are two separate bank holding companies. Bank of Tokyo-Mitsubishi and UFJ Bank merged on January 1, 2006 to form The Bank of Tokyo-Mitsubishi UFJ, Ltd. Our data period does not cover this merger.

total assets (book value), stock holder's equity (book value) and short-term liability are needed. For the risk free rate, the 3-month *Saiken Gensaki* rate (or the 3-month bond repurchase rate) is used for the period of April 1, 1985 to May 31, 1992, and then the 3-month *Financial Bill (FB)* rate is used for the period of June 1, 1992 to August 12, 2005. This is because the government short-term paper (FB) yield is only available from 1992. Market capitalization data, which is daily data calculated with daily stock prices (closing price) multiplied by the number of issued stocks. During the 1980s, bond repurchase was on some days not priced so that adjacent values of the risk free rate are used when some values are missing. When the closing stock price is not available, we applied the same method; that is, if one day is missing the previous day's data was copied. Several days missing; a gradual adjustment using two edge's data, like linear interpolation for normal approximation of binomial distributions.

Regarding accounting data, we examined organizational structure under holding companies and a number of subsidiaries included in consolidated financial statements.⁷ Unconsolidated financial statements of a bank represent the banks' healthiness however in most cases the data is not available because banks are de-listed when holding companies are listed instead.⁸ Most banks do not necessarily report their statements unless they issue bonds.

Consolidated financial statements and income statements are used as an alternative as parent companies' unconsolidated statements do not contain relevant

⁷ Changes in organizational structure are thoroughly examined in Harada and Ito (2008).

⁸ The difference between Consolidated and Unconsolidated usually is due to including or excluding some smaller financial subsidiaries and overseas incorporated subsidiaries. How to match balance sheets before and after is complicated sometimes (especially for Mizuho). At the time of merger, some assets (real estate, and good-will values) might be reevaluated, so that they may not match. Good-will values are capitalized to boost the capital ratio in some merger cases. See Harada and Ito (2008) for detail.

information. For Mizuho Bank, Mizuho Corp. Bank, Bank of Tokyo Mitsubishi, UFJ Bank, we use consolidated statements but for Sumitomo Mitsui Bank, unconsolidated statements are available and they are used.⁹ For the details of short-term liability data, see Appendix Table1.

In our study of the Japanese banking sector between 1985 and 2005, in order to separate individual bank merger effects from macro business conditions, we created a benchmark bank that are free from any merger event during the sample period. Chiba Bank, Yokohama Bank, Shizuoka Bank, Hiroshima Bank and Fukuoka Bank are selected based on asset size. Unconsolidated financial statements for each bank are used from March 1985 to March 2005 and daily stock prices and the number of issued stocks of these banks are used for the benchmark's market capitalization. These five banks are selected because their asset sizes are among the largest for regional banks and they did not experience any merger. All major banks went under FHC so that this type of benchmark bank is needed to do some comparison.

Obtaining the DD of the benchmark bank is a simple calculation. The DD for each regional bank is added then averaged. News which affects the banking sector is reflected in the benchmark as well as merged banks. So it is possible to see what movements in the DD are caused by macro economic news.

Our hypothetical idea is whether a merger is neutral. If a merged bank is just the sum of individual banks, then we treat the merger as neutral. That is, for example; “DD (bank A+ bank B+ bank C) before merger = DD (new bank) after merger” is a neutral case, “DD before merger > DD after merger” means an unhealthy merger, and

⁹ Interim (semi-annual) figures are not available until 2001 September so we use full year results from 1985 to 2001. Available items of financial statements in the Nikkei Financial Quest are different. As an example, sub-items of total deposits are not available in interim figures.

“DD before merger < DD after merger” means a healthy merger taking advantage of scale economy. A hypothetical bank in each merger is named as “DD before [bank name]” (that is, the DD before Mizuho FG, the DD before MTFG, the DD before UFH Holdings, and the DD before SMFG, respectively) which is created using combined data of the predecessor banks. If the level of the DD of merged banks did not significantly change from the hypothetical bank before the merger, then we regard the merger as not adding any value to financial strength. If the DD becomes lower after the merger, then the merger was counterproductive, in that the merger made the bank weaker.

4.2 The DD before and after merger

In this subsection, we briefly look at the level of the DD before and after mergers in figures. The DDs of the banks before mergers, a hypothetical bank and the merged bank are shown in each graph which ranges from 1985 to 2005. In figures focusing after 2000, the DD of the benchmark bank is added to compare movements in the level.

4.2.1 Mizuho Financial Group¹⁰

Basic financial information of banks in the Mizuho Financial Group (Mizuho FG), the time period of their stocks being listed in the Tokyo Stock Exchange, and their

¹⁰ DKB and Fuji are two independent banks until September 21, 2000. As such, unconsolidated financial statements are used until that date. From September 28, 2000 to August 12, 2005 Mizuho Holdings (Mizuho FG) is a listed company. Regarding financial statements, combined financial statements of DKB and Fuji are used until March 2003 because the listed company, Mizuho Holdings, is just an ‘umbrella’. From March 2003 consolidated financial statements of Mizuho FG are available.

market capitalization are shown in **Appendix Table 2**.¹¹ **Figure 1-1** is the DD before Mizuho FG was formed, and **Figure 1-2** is the DD of each predecessor, the benchmark and the FG of recent years after 2000. The first one-year data is needed in the process of calculating the DD, so there are some discontinuities in the DD. Our interest is how the DD changed over the whole sample period, especially after 2000, which is captured in the figures.

We have five banks in figure1-2. DKB, Fuji Bank and IBJ were listed until September 21, 2000. Then these three banks were delisted and Mizuho Holdings, (later Mizuho Financial Group), from March 12, 2003 was listed. The level of the DD of Mizuho Holdings after the merger did not significantly change from the DD before Mizuho FG in Figures 1-2.

In the 1980s, the DD before Mizuho FG was above 2 ranging from 2 to 7. When the stock market bubble burst in 1990, the DD fell toward zero until 1993. From 1997 to spring of 1999, the DD approached zero again. When the news of the merger was announced on August 20 1999, the DD was deep in the negative value and the DD suddenly became higher upon the merger news.¹² Positive DD did not

¹¹. Note about stock price data of Mizuho; the before-merger price and the after-merger price have different units. They changed the unit. Before the merger, the unit of trade was 1,000 shares and after the merger, the unit of trade is 1 share. We have information on the number of shares outstanding. We know that the capitalization (price multiplied by shares) did not change. Difference in units is considered, however the following fact is not adjusted. After the merger, banks formed a holding company structure. The listed shares are for the holding company, and the holding company owns 100 percent of each bank. Sometimes, other financial institutions are put under the holding companies. Individual cases are different in how the merger was handled. Mizuho merger was complicated. Mizuho reorganized three banks (DKB, IBJ, Fuji) into two functional banks (Mizuho and Mizuho Corporate) and then later they became the subsidiaries of the umbrella holding company, Mizuho Holdings.

¹² The negative value comes together with negative asset growth. In theory, DD should not be negative. It is possible to build a restriction in the program and truncate the DD at zero, however, we choose to leave it as it shows as the result is the same. Negative value could bring us caution and information.

last more than a year and again it approached negative towards the actual merger day. After the merger however, the level of the DD did not improve and was negative until September 2003. When the DD was negative, Mizuho Holdings created Mizuho FG (January 8), and became a subsidiary of the Financial Group (March 12).

In the figures, the negative DD is sometimes observed. Our result of the DD by and large explains that the three previously-mentioned banks and Mizuho FG were not sound banks according to the level of the DD.

4.2.2 Mitsubishi Tokyo Financial Group

Appendix Table 3 shows banks included in Mitsubishi Tokyo Financial Group (MTFG), their listed period on the Tokyo Stock Exchange and market capitalization. **Figure 2-1** is the DD before MTFG and the DD of MTFG. **Figure 2-3** is the DD of three banks after 2000. Two merger events occurred during our sample period; one is Mitsubishi Tokyo Bank which is created by the merger of Mitsubishi bank and Tokyo bank on April 1 1996 and the other one is the launch of MTFG on April 1 2001. The DD of the former merger is measured in **Figure 2-2** which covers the period 1995 to 1996. The hypothetical bank is a combined bank of Mitsubishi Bank and Tokyo bank.

The level of the DD of Bank of Tokyo Mitsubishi in Figure 2-1 rose once again from negative to positive but they are low levels in the latter half of the 1990s and improve after their launch in 2001. The DD before Bank of Tokyo Mitsubishi

¹⁴ On August 13 2004, Mitsubishi Tokyo Financial Group and UFJ Holdings announced that they would merge and launch Mitsubishi UFJ Group by the end of September 2005. The new group name, Mitsubishi UFJ Financial Group, was announced February 18, 2005. This news had negative impact on Mitsubishi Tokyo Financial Group because 0.62 MTFG share was the exchange unit for 1 UFJ share.

also increased towards the merger in 1996. Around the merger period, the DD approached 6. Movements in the DD in general show similar patterns with other banks in the 1990s, however, one remarkable feature for MTFG is that the DD turned positive when merger news was announced (March 28, 1995) and increased towards the day of the merger.

One feature of the MTFG is obvious from Figure 2-3. The DD of MTFG did not become negative after the merger or reorganization. This contrasts to other bank groups in our sample.

4.2.3 UFJ Holdings

UFJ Bank was formed by the merger of Sanwa Bank and Tokai Bank on April 2, 2001 and UFJ Holdings was created on the same day (see **Appendix Table4**). **Figure 3-1** and **Figure 3-2** are the DD of banks belonging to UFJ Holdings.

The merger was announced about one year earlier on June 15, 2000 however the level of the DD did not change noticeably after the announcement. When UFJ Holdings was listed, the DD became and remained negative until mid-2003. It did not move into positive territory until MTFG announced the forthcoming merger with UFJ Holdings.¹⁴

After 2000, movements in the DD are similar with that of Mizuho FG. In Figure 3-2, there are two spikes, one is around Spring in 2004 and the other is towards Summer in 2005. These spikes are related to the news of consolidation. On May 21, 2004, UFJ Holdings announced it was selling UFJ Trust Bank to Sumitomo Trust Bank for 300 billion yen. However, on August 13, 2004, MTFG and UFJ Holdings announced that they would merge and launch Mitsubishi UFJ Financial Group by the end of September 2005. (The new group name, Mitsubishi UFJ

Financial Group, was announced February 18, 2005.) Although this news had a negative impact on MTFG because 0.62 MTFG share was the exchange unit for 1 UFJ share, it had a positive impact on the UFJ side.

4.2.4 Sumitomo Mitsui Financial Group

For the case of Sumitomo Mitsui Financial Group (SMFG), **Appendix Table 5** explains how the two banks are consolidated into SMFG. **Figure 4-1** shows the level of DD. **Figure 4-2** is the DD after 2000.

Sumitomo Mitsui Banking Corp. (SMBC) was established by the merger of Sumitomo Bank and Sakura Bank on April 1, 2001 (The news was announced on October 14, 1999). Therefore DD of hypothetical bank, DD before SMFG, which is composed of Sumitomo Bank and Sakura Bank, covers the period from 1985 to March 2001.¹⁵ Later, on December 2, 2002, SMFG was formed and SMBC was absorbed by the Financial Group as one of its 100 % subsidiary banks. SMBC which is under the SMFG merged with one of its subsidiary banks, Wakashio Bank, on March 17 2003 (The news was announced on December 25 2002). The complexity of this merger makes the analysis more difficult in this case.¹⁶

The level of the DD suddenly became negative from December 2002 and this period is consistent with the announcement of its merger with Wakashio bank. The DD of SMBC dropped to zero and became negative when SMFG was listed in

¹⁵ Sakura Bank was established in April 1990 by the merger of Mitsui Bank and Taiyo Kobe Bank. This merger case is not counted as one event in SMBC because the merger was guided by the authorities.

¹⁶ Wakashio bank was established in June 1996 and started operation in September 1996. In March 2003 SMBC merged with Wakashio Bank but the merged bank's name became Sumitomo Mitsui Banking Corporation. In the merger, unrealized equity losses of SMBC were eliminated. See Harada and Ito (2007) for detail.

2003.

4.2.5 Summary and Interpretation

By examining the four merger cases, it seems obvious that directions of movement are almost the same for Mizuho Financial Group, UFJ Holdings and Sumitomo Mitsui Financial Holdings. Their DD stayed at zero for about one to two years after the merger. Tokyo Mitsubishi Financial Group was an exceptional case because its DD did not turn negative after the merger.

Three mergers out of four were treated as if they were nearly insolvent financial groups. After their mergers, their stability did not improve according to the DD which reflects market view. There is suspicion that bank mergers were intended to take advantage of too-big-to-fail policy, but the market reacted adversely. Spiegel and Yamori (2004) find that the set of banks treated as too-big-to-fail were progressively narrowed as the financial situation deteriorated and the funds of the DIC were depleted. Earlier studies such as Brewer et al (1999) find evidence in favor of some “too-big-to-fail” protection for large banks but the regulatory advantage of large Japanese banks no longer existed at that time. That is, our results with the DD are consistent with the findings in Spiegel and Yamori (2004). After the failures of two long-term credit banks, the Long-Term Credit Bank of Japan and the Nippon Credit Bank, the market considered that weak banks might fail (and eventually taken over by the government) regardless of the asset size.

4.3 T-test on the difference of the DD

Two types of event windows, 250 business days and 500 business days, are

examined for the changes in the level of the DD, and a paired t-test is conducted on the differences between our bank of interest and the benchmark bank. The 250 day event window captures approximately one year before and after the merger. The 500 day one reveals the rather long term effects of mergers as they progress for two years after merger and display the effects..

We compare two paired groups which show the differences between the DD of a hypothetical bank and a merged bank. The paired t-test is used. Under the t-test, it is assumed that the data come from the same subject and does not assume that the variance of populations is equal. This type of t-test is used to compare means on the same subject in differing circumstances which are a before-after situation in our paper.

The hypothesis is that the differences of before and that of after are different. Given two paired sets X_i and Y_i of n observations, the paired t test determines if they differ from each other in a significant way.

$$\hat{X}_i = (X_i - \bar{X})$$

$$\hat{Y}_i = (Y_i - \bar{Y})$$

$$t = (\bar{X} - \bar{Y}) \sqrt{\frac{n(n-1)}{\sum_{i=1}^n (\hat{X}_i - \hat{Y}_i)^2}}$$

where \hat{X}_i displays before the merger of the DD, \hat{Y}_i shows data after the merger difference.

4.3.1 Mizuho Financial Group

The average DD of Mizuho FG is smaller than before and even after the merger compared with the benchmark DD. It is 0.517 before and -0.743 after the merger for 500 day window, -0.030 before and -0.740 after for 250 day window in **Table 1**.

Narrowing the event window, the DD of Mizuho FG are both negative (-0.030 and -0.740). That is the average DD the merger period is below zero and the soundness of these banks does not seem to have changed even after forming a new financial group.

The paired t-test is conducted between the before-merger difference and the after-merger difference. The difference between the DD of Mizuho FG and that of the benchmark is calculated for the after-merger difference. For the before-merger period, the difference between the DD of Mizuho Predecessors and that of the benchmark is used. The null hypothesis of no difference is rejected at the 1% significance level (They are -31.66 and -44.36 in Table5). As the difference is negative, it implies that Mizuho FG was considered a weaker bank than other major regional banks.

4.3.2 Mitsubishi Tokyo Financial Group

In **Table 2**, event 1 is the merger of Mitsubishi Bank and Tokyo Bank in 1996 and event 2 is the launch of MTFG. Our results were basically the same in both events.

The average DDs of Mitsubishi Bank and MTFG are mostly larger than that of the benchmark bank before and after the merger. This is an outstanding difference because no merger event improved the level of the DD except the case of MTFG. For event 2, the average DD for benchmark is 1.972 before the merger and 1.721 after the merger and those of MTFG are 0.637 and 1.659 in 500 day window and 0.192 and 1.642 in 250 day window. It shows that launching MTFG was a positive event and it lessened the default probability of the bank.

The paired t-test for MTFG is also significant at 1% level. This means that the difference is statistically significant before-and-after-merger periods. However,

the magnitude of difference itself is smaller when compared with other banks. They are for example -25.6 and -9.1 for the establishment of MTFG (event 2) in Table 5.

4.3.3 UFJ Holdings

The average DD of UFJ Holdings in **Table 3** is quite similar with the case of Mizuho FG. It became smaller before and after the merger compared with the benchmark DD. It is 0.384 before and -0.857 after the merger in 500 day window, 0.454 before and -1.868 after in 250 day window. The DD for the benchmark bank was stable during the period but was sharply lowered after the launch of UFJ Holdings and the average DD was below zero after the event. These results are consistent with that the core bank of UFJ Holdings, Sanwa bank had a huge amount of NPL and their asset quality was poor compared with other banks. Our result implies that the risk of UFJ Holdings did not improve after the launch.

The results of paired t-test are -70.44 and -24.29 for UFJ Holdings in Table 5. Again, the null hypothesis of no difference is rejected at the 1% significance level. As the difference is negative, UFJ Holdings was also considered a weaker bank than major regional banks.

4.3.4 Sumitomo Mitsui Financial Group

Concerning SMFG, the level of the DD did not improve after the merger (see **Table 4**). The result is similar with those of Mizuho FG and UFJ Holdings. That is, the DD became smaller in the latter half of the event window and it was smaller than that of other benchmark bank.

The paired t-test for SMFG is significant at 1% level. The results of other banks are carried over. The before-and-after-merger performances are different (see

Table5).

All in all, our results support the view that mergers did not create healthy banks. The difference of the DD for before-merger and after-merger periods was significantly different for all banks and that implies the performance of the DD of merged banks were not the same with original predecessors. Macro finance news is related to the negative DD after the merger period, around late 2002 and 2003. For example, October 1, 2002 Minister Yanagisawa was suddenly replaced by Mr Takenaka who had been talking tough on banking policys. When the new Minister said that cleaning up the mountain of NPLs would have inevitably increased unemployment and bankruptcies. The Takenaka plan was to force banks to recognize and write off bad loans much sooner than they were willing to do. The news caused the banks' stock prices to drop dramatically. The negative DD basically reflected the financial weakness of merged banks however the shocking announcement must have had some affect on the level of the DD.

5. Conclusions

The paper examines whether or not mergers in the late 1990s and 2000s helped Japanese banks escape from failure and whether mergers enhanced their financial soundness. Banks are considered to be fragile when their capital base has deteriorated, a large portion of their loan is nonperforming, or when potential losses from other sources are apparent.

Our results show that financial soundness of a merged bank depends heavily on that of the pre-merged banks. Mergers do not secure a banks's financial health because the level of the DD did not improve after the merger. A merger of sound (unsound) banks produces a sound (unsound) merged financial institution. In

addition, not only did the merger not improve the DD of the pre-merged banks, but a merged bank often experienced the negative DD right after the merger. These findings are consistent with the view that mergers were not motivated by a desire to restore sound banking. In fact market participants still evaluated merged banks as weak banks.

Based on our results, mergers did not help lessen the possibility of failure (exceptional case was MTFG). Taking advantage of the too-big-to-fail policy was considered as one of the possible motives because the average DD was negative for most merger cases after the merger period. These results would not be observed if predecessor banks improved their balance sheets before the mergers. Japanese banks chose “equal merger”, as opposed to takeovers, and a limited a scope of serious restructuring. Also the merger accounting method used was not a widely accepted practice abroad. These facts were reflected in the calculation of the DD and the DD revealed that mega-mergers of Japanese banks were consolidations of financially weak banks.

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Figure 1-1 Mizuho FG DD from 1985 to 2005

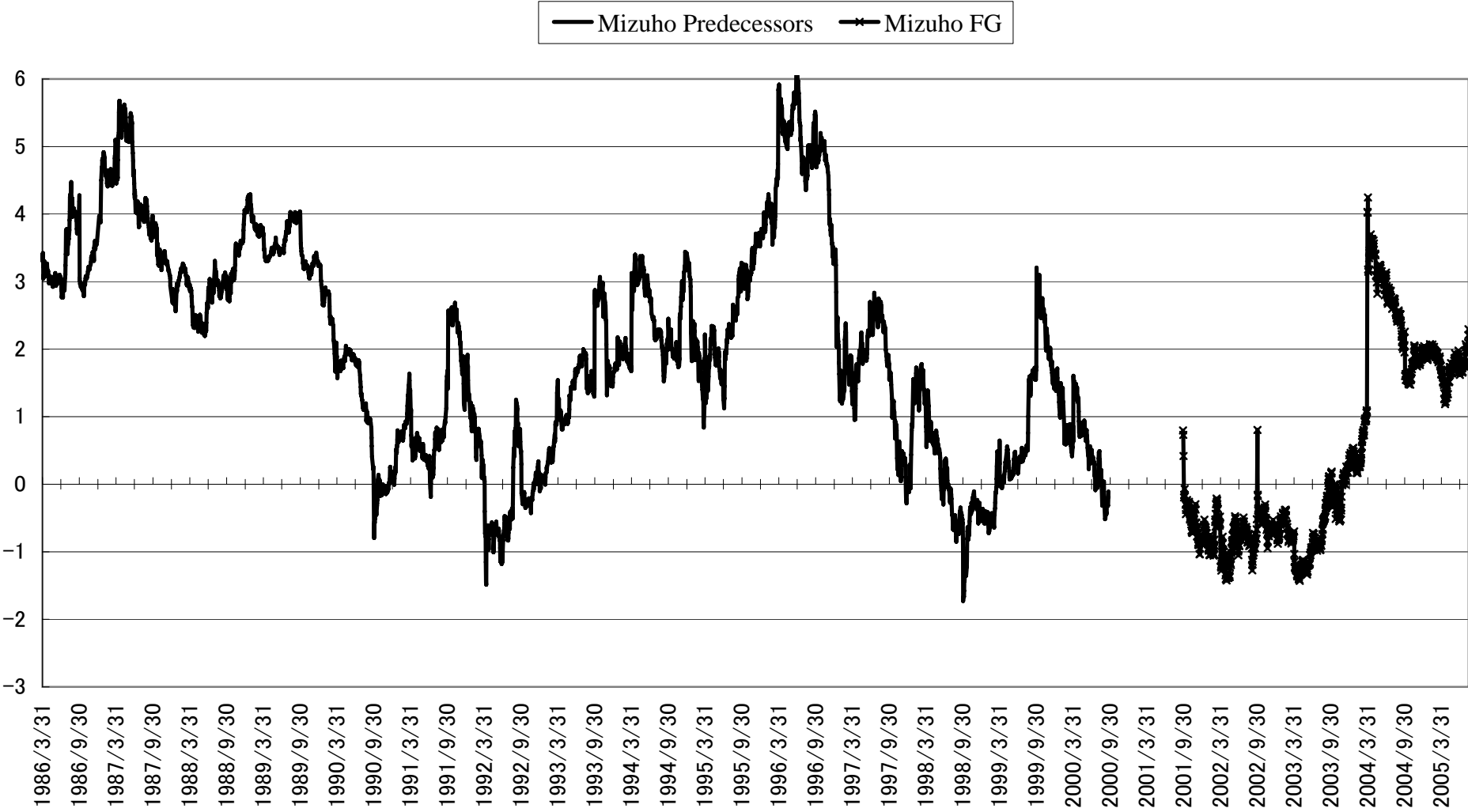


Figure 1-2 Mizuho FG DD from 2000

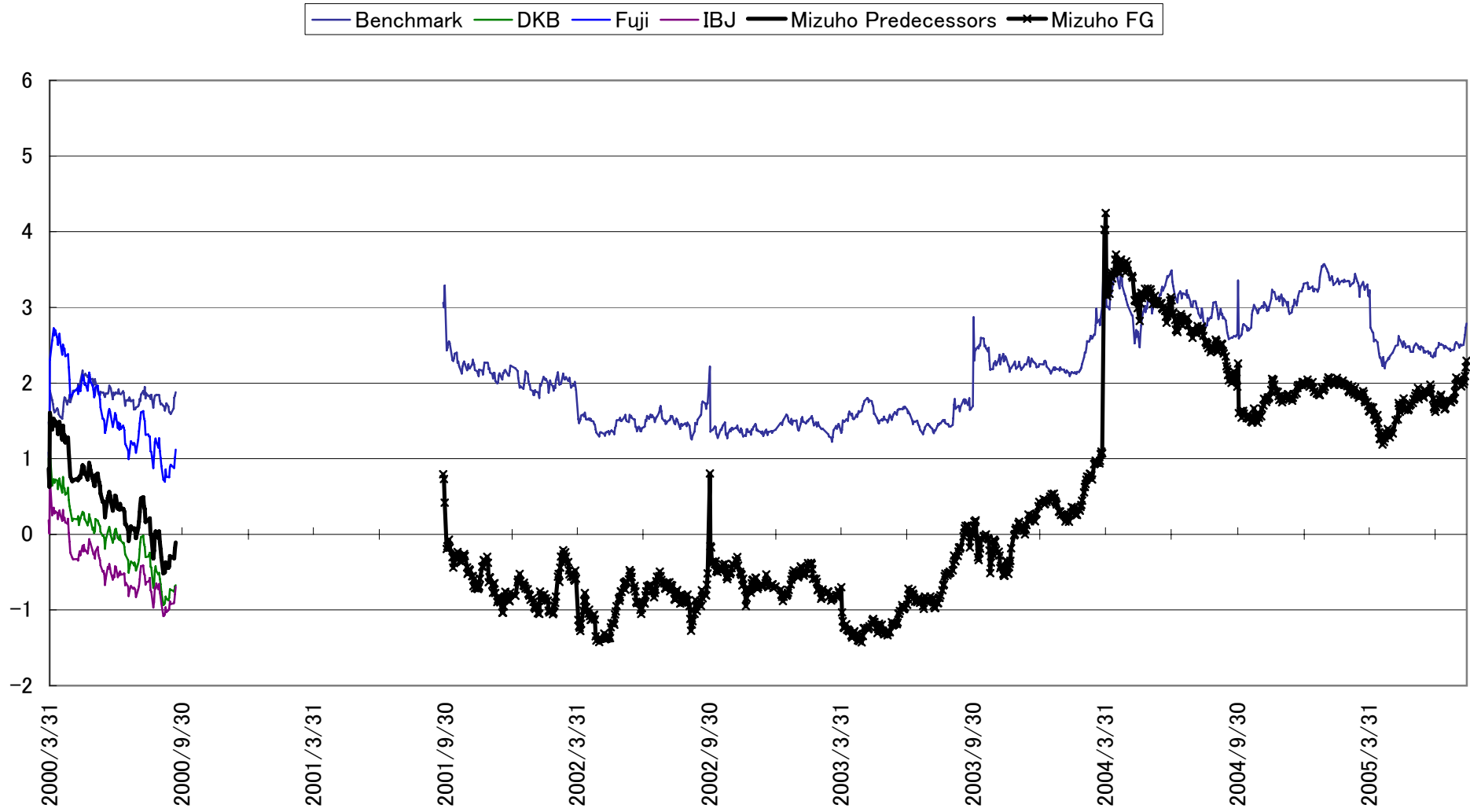


Figure 2-1 MTFG DD from 1985 to 2005

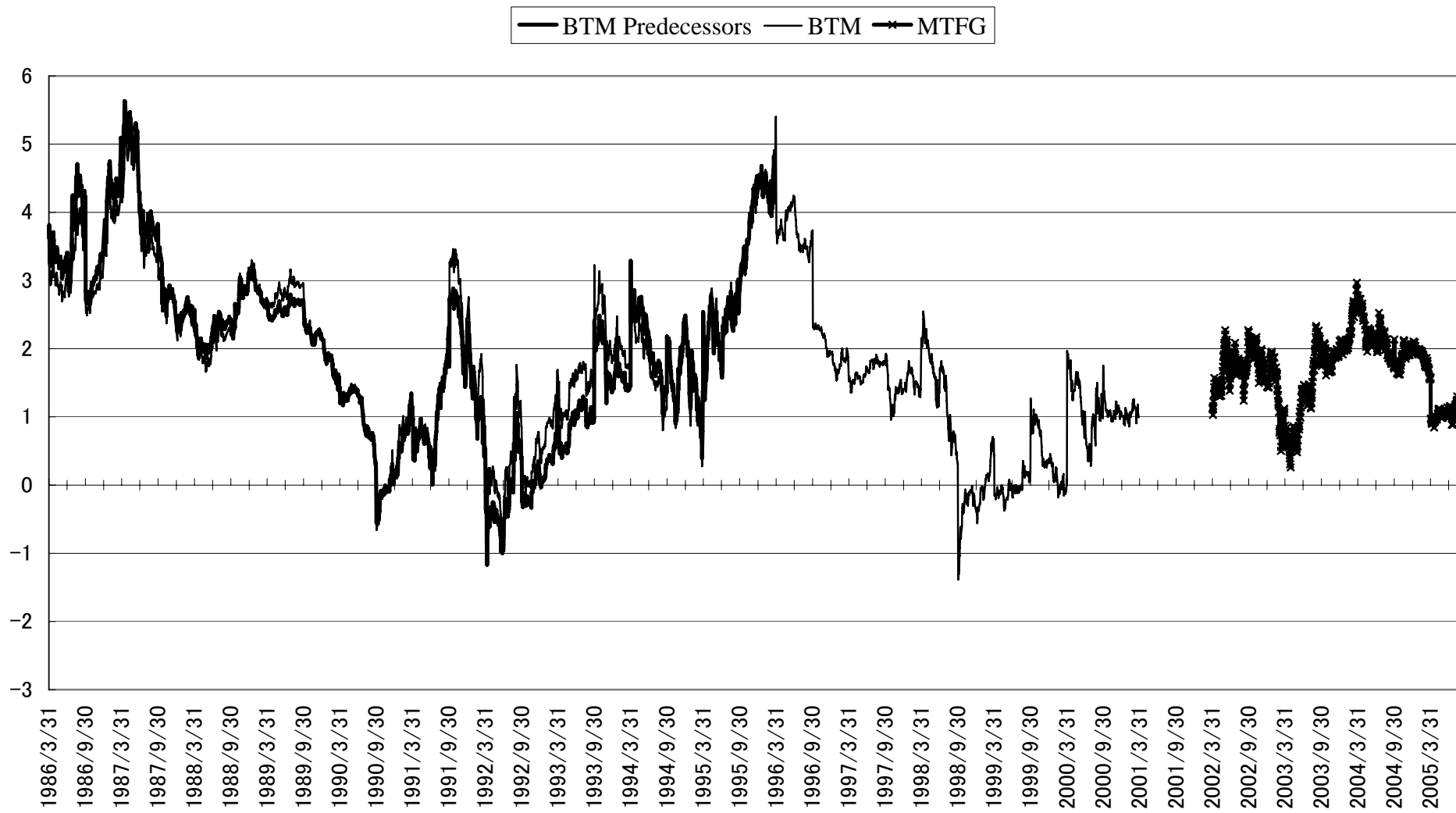


Figure 2-2 MTFG DD from 1995 to 1996

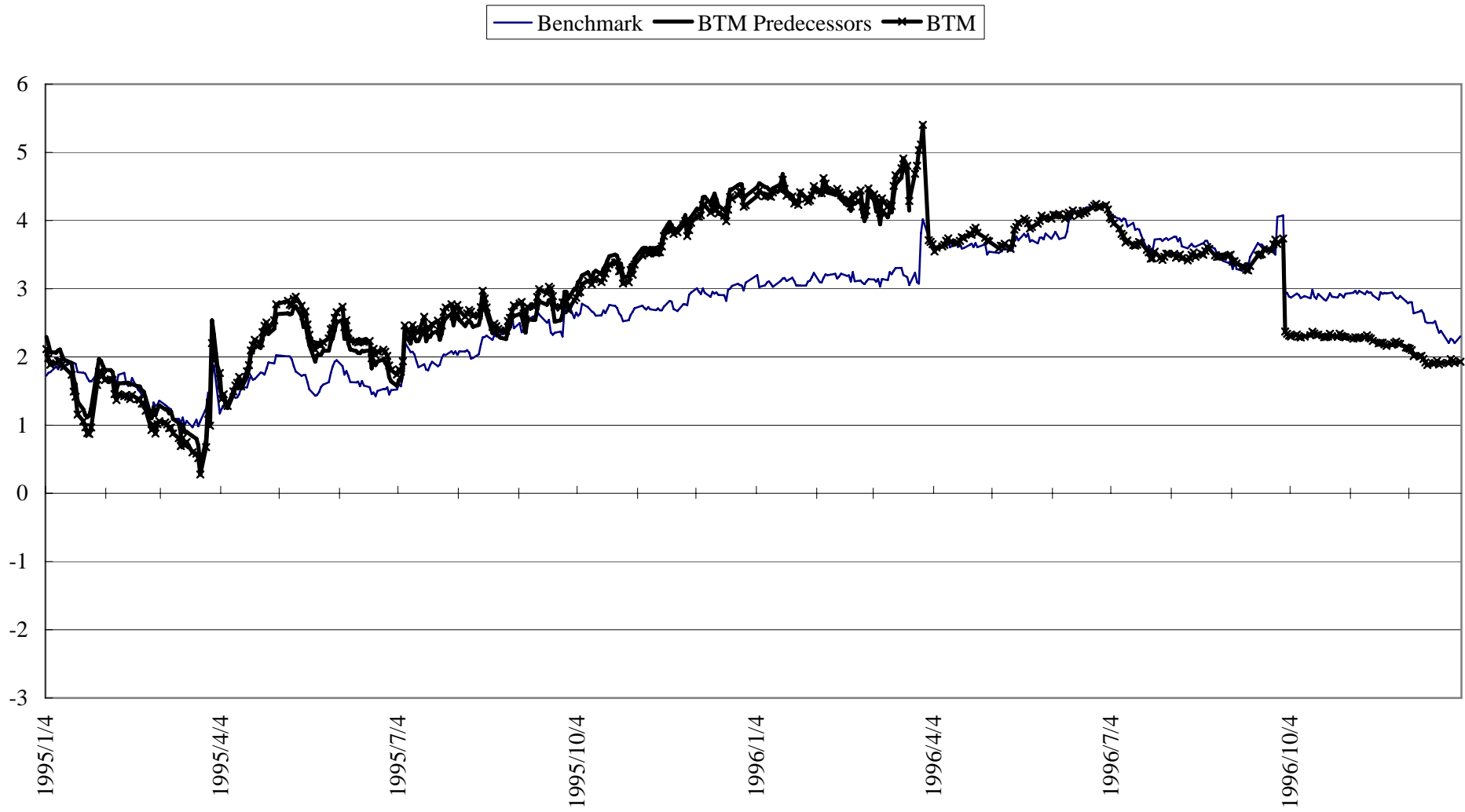


Figure 2-3 MTFG DD from 2000

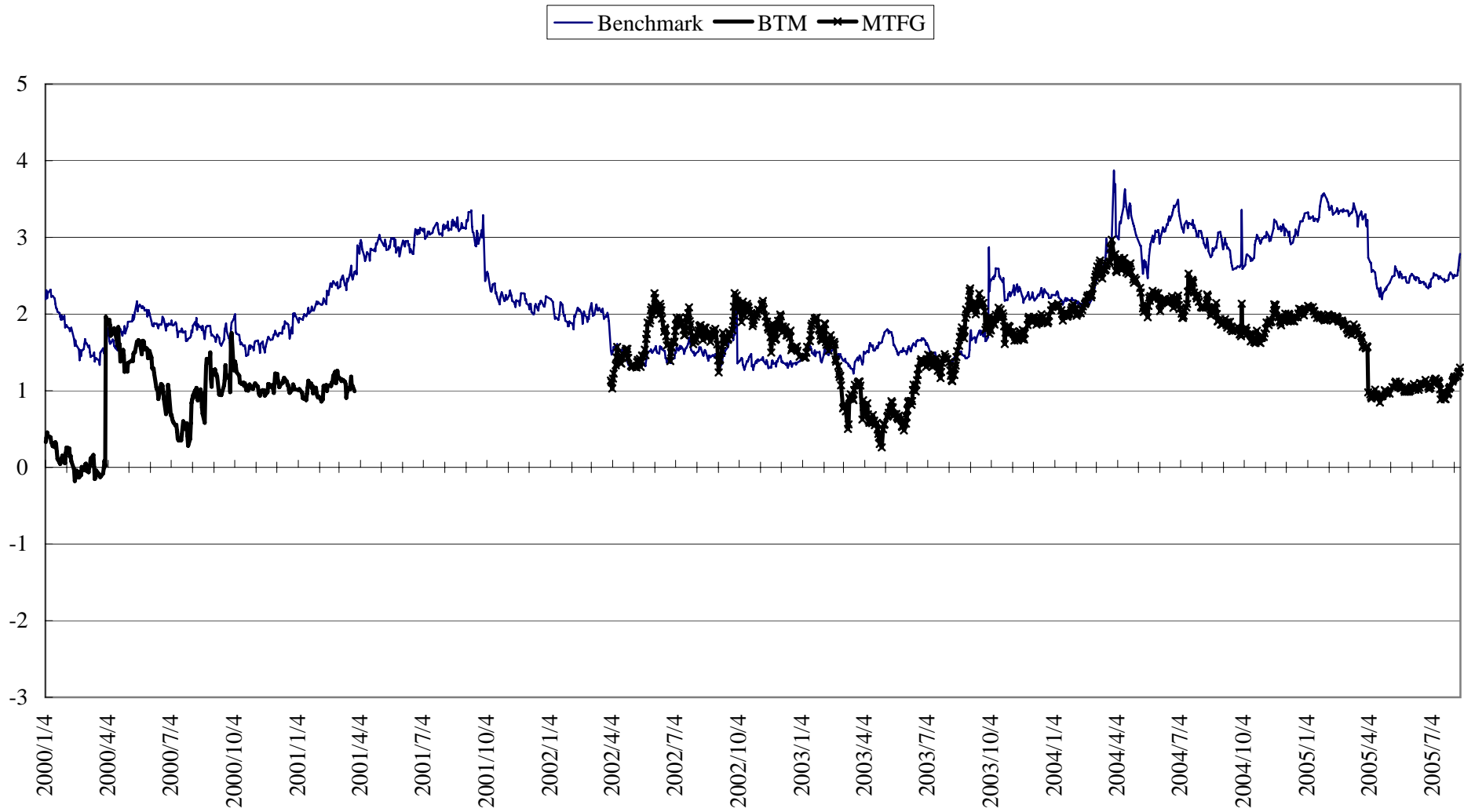


Figure 3-1 UFJHD DD from 1985 to 2005



Figure 3-2 UFJ DD from 2000

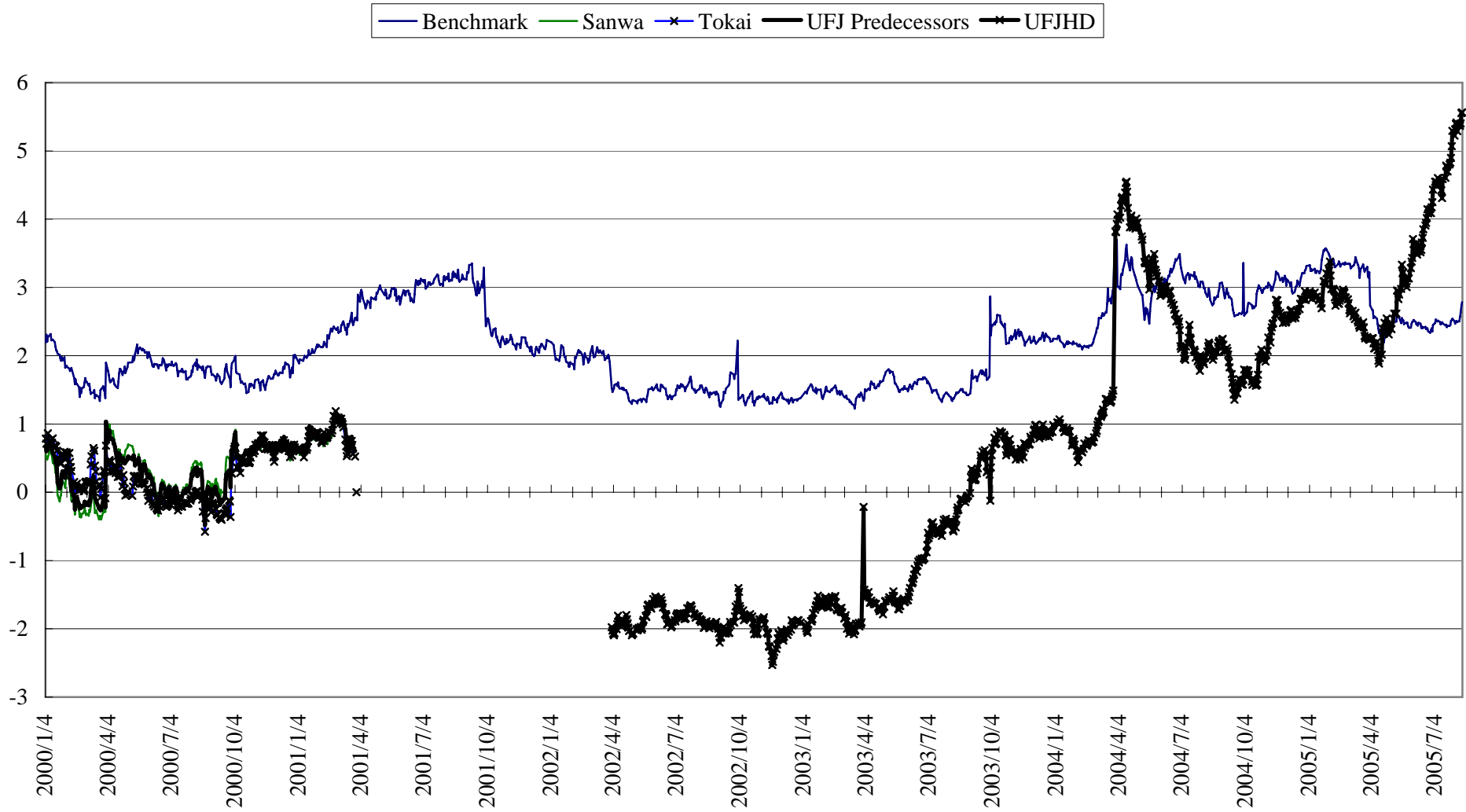


Figure 4 - 1 SMFG DD from 1985 to 2005

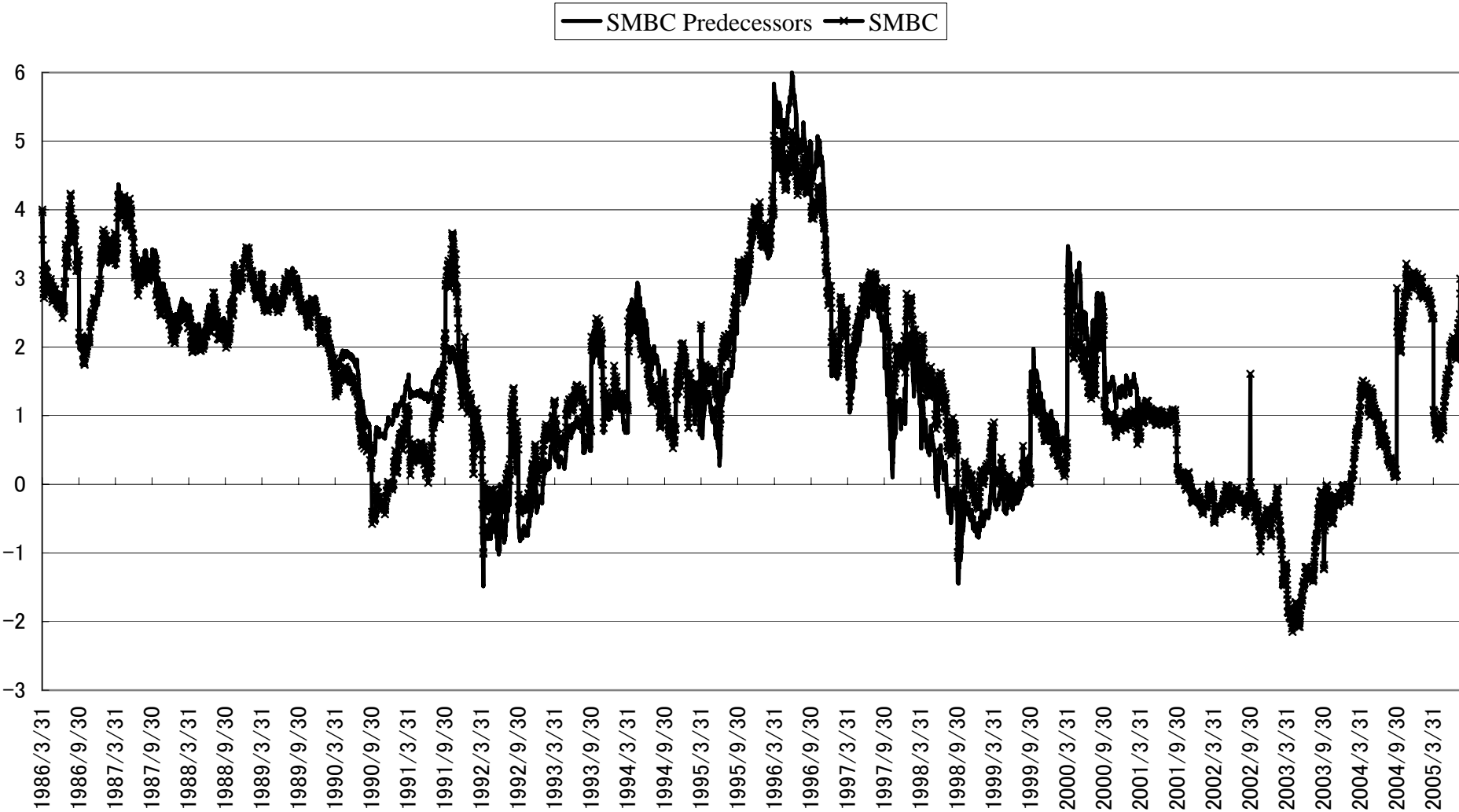


Figure 4-2 SMFG DD from 2000

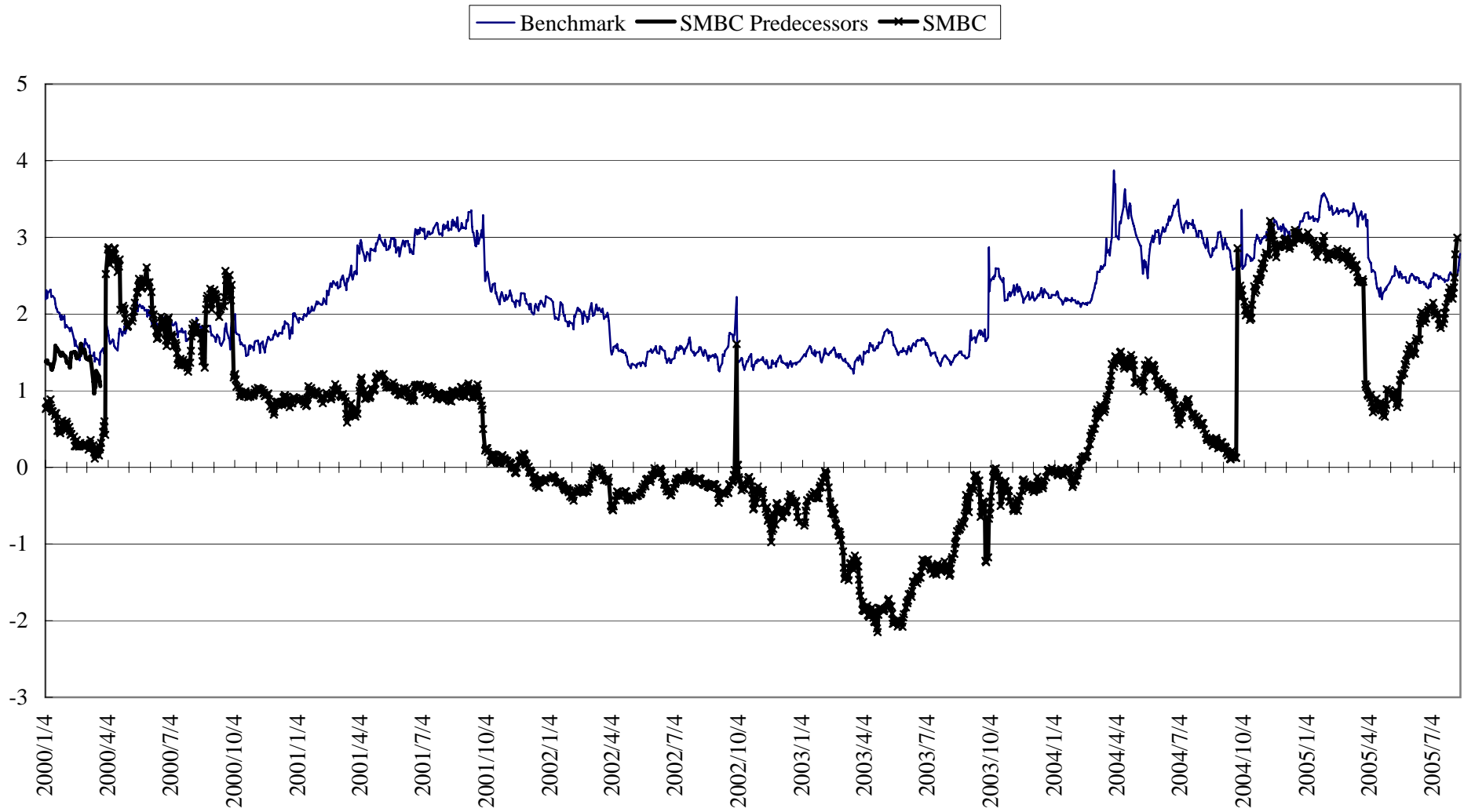


Table1:Mizuho Financial Group

Event window 500days

DD average	before merger		after merger	
	1998/9/10	2000/9/21	2001/9/26	2003/10/7
benchmark	1.706		1.659	
Mizuho	0.517		-0.743	

Event window 250days

DD average	before merger		after merger	
	1998/9/10	2000/9/21	2001/9/26	2003/10/7
benchmark	1.428		1.805	
Mizuho	-0.030		-0.740	

Table2: Mitsubishi Tokyo Financial Group

Event 1: Event window 500days

DD average	before merger		after merger	
	1994/3/16	1996/3/22	1996/3/26	1998/4/3
benchmark	2.039		1.813	
BTM	2.452		2.244	

Event window 250days

DD average	before merger		after merger	
	1995/3/22	1996/3/22	1996/3/26	1997/3/31
benchmark	2.380		2.963	
BTM	3.058		2.917	

Event 2:Event window 500days

DD average	before merger		after merger	
	1999/3/15	2001/3/26	2002/4/1	2004/4/8
benchmark	1.972		1.721	
MTFG	0.637		1.659	

Event window 250days

DD average	before merger		after merger	
	2000/3/22	2001/3/26	2002/4/1	2003/4/4
benchmark	2.070		1.450	
MTFG	0.192		1.642	

Table3:UFJ Holdings

Event window 500days

DD average	before merger		after merger	
	1999/3/15	2001/3/26	2002/4/1	2004/4/8
benchmark	1.972		1.721	
UFJ	0.384		-0.857	

Event window 250days

DD average	before merger		after merger	
	2000/3/22	2001/3/26	2002/4/1	2003/4/4
benchmark	1.871		1.450	
UFJ	0.454		-1.868	

Table4:Sumitomo Mitsui Financial Group

Event window 500days

DD average	before merger		after merger	
	1999/3/15	2001/3/26	2001/3/27	2003/4/7
benchmark	1.972		1.427	
SMBC	1.201		-0.716	

Event window 250days

DD average	before merger		after merger	
	2000/3/22	2001/3/26	2001/3/27	2002/4/1
benchmark	1.871		2.562	
SMBC	1.969		0.460	

Table5: Paired t-test

Event window 250days	
mizuho	-31.66 ***
BTM event1	-86.86 ***
BTM event2	-25.60 ***
UFJ	-70.44 ***
SMBC	-50.16 ***
Event window 500days	
mizuho	-44.36 ***
BTM event1	-40.71 ***
BTM event2	-9.10 ***
UFJ	-24.29 ***
SMBC	-27.56 ***

Appendix Table1: Short term and long term liability of banks

Short term liability	Long term liability
Deposits	Debentures
Negotiable certificates of deposit	Straight bonds
Call money	Convertible bonds
Payables under repurchase agreements	Due to trust accounts
Payables under securities lending transactions	Reserve for employee retirement benefit
Bills sold	
Commercial papers	
Trading liabilities	
Borrowed money	
Foreign exchanges	
Short-term corporate bonds	
Other liabilities	
Reserve for employees' bonus	
Reserve for directors' bonus	
Other reserves	
Reserves under special laws	
Deferred tax liabilities	
Deferred tax liabilities for land revaluation	
Acceptances and guarantees	

Note1: Deposits include Current deposits, Ordinary deposits, Savings deposits, Deposits at notice, Time deposits and Installment savings.

Note2: Trading liabilities include Trading securities sold for short sales, Derivatives of trading securities, Securities related to trading transactions sold for short sales, Derivatives of securities related to trading transactions and Trading-related financial derivatives.

Appendix Table2: Mizuho Financial Group

Name	DD period	Stock price period	Financial statement period
DKB	March 31, 1986 to September 21, 2000	April 1, 1985 to September 21, 2000	DKB Unconsolidated March 1985 to March 2000
Fuji	March 31, 1986 to September 21, 2000	April 1, 1985 to September 21, 2000	Fuji Unconsolidated March 1985 to March 2000
IBJ	March 31, 1986 to September 21, 2000	April 1, 1985 to September 21, 2000	IBJ Unconsolidated March 1985 to March 2000
Mizuho Predecessors (DKB+Fuji+IBJ)	March 31, 1986 to September 21, 2000	April 1, 1985 to September 21, 2000	(DKB+Fuji+IBJ) Unconsolidated March 1985 to March 2000
Mizuho FG	September 26, 2001 to August 12, 2005. DD is not available from March 6, 2003 to March 11, 2003 due to the structural change from Mizuho JFD to	September 28, 2000 to August 12, 2005	(Mizuho+Mizuho Corporate) Unconsolidated March 2000 to March 2005

Appendix Table 3: Mitsubishi Tokyo Financial Group

Name	DD period	Stock price period	Financial statement period
BTM	March 31, 1986 to March 21, 2001	April 1, 1985 to March 21, 2001	BTM Unconsolidated March 1985 to March 2001
Tokyo	March 31, 1986 to March 21, 2001	April 1, 1985 to March 21, 2001	Tokyo Unconsolidated March 1985 to March 1996
MTFG Predecessors (Mitsubishi+Tokyo)	March 31, 1986 to March 21, 2001	April 1, 1985 to March 21, 2001	(Mitsubishi+Tokyo) Unconsolidated March 1985 to March 1996
MTFG	April 1, 2001 to August 12, 2005	April 1, 2001 to August 12, 2005	MTFG Consolidated September 2001 to March 2005. Financial statement of March 2001 is not available due to the consolidation

Appendix Table 4: UFJ Holdings

Name	DD period	Stock price period	Financial statement period
Sanwa	March 31, 1986 to March 26, 2001	April 1, 1985 to March 26, 2001	Sanwa Unconsolidated March 1985 to March 2001
Tokai	March 31, 1986 to March 26, 2001	April 1, 1985 to March 26, 2001	Tokai Unconsolidated March 1985 to March 2001
UFJ Predecessors (Sanwa+Tokai)	March 31, 1986 to March 26, 2001	April 1, 1985 to March 26, 2001	(Sanwa+Tokai) Unconsolidated March 1985 to March 2001
UFJHD	April 1, 2001 to August 12, 2005	April 1, 2001 to August 12, 2005	UFJHD Consolidated September 2001 to March 2005 Financial statement of March 2001 is not available due to the consolidation

Appendix Table 5: Sumitomo Mitsui Financial Group

Name	DD period	Stock price period	Financial statement period
Sumitomo (later SMBC then SMFG)	March 31, 1986 to August 12, 2005 November 26, 2002 to December 1, 2002 DD is not available as the stock price is	April 1, 1985 to November 25, 2002 and December 2, 2002 to August 12, 2005	SMBC(N0070010) Unconsolidated March 1985 to September 2002 SMFG(N0070174) Unconsolidated March 2003 to March 2005 Financial statement of March 2001 is not available due to the consolidation
Sakura	March 31 1986 to March 26 2001	April 1 1985 to March 26 2001	Sakura Unconsolidated March 1985 to March 2001
TaiyoKobe	March 31 1986 to March 23 1990	April 1 1985 to March 23 1990	Unconsolidated March 1985 to March 1990
SMBC Predecessors (Sumitomo+Sakura)	March 31 1986 to March 26 2001	April 1 1985 to March 26 2001	(Sumitomo+Sakura) Unconsolidated March 1985 to March 2001