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How Did Japanese Banks Make Cutbacks in the 1990's?

Nobuyoshi Yamori and Kazumine Kondo
Graduate School of Economics, Nagoya University
Nagoya 464-8601, Japan

ABSTRACT

Focusing on the cross-sectional variation in bank branch changes, this paper finds that Japanese banks reduced their operations in order to correct decisions they made during the bubble period, but they put off the correction until the late 1990s due to a lack of market pressure.

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Keywords: Bank branch; Market discipline; Bubble economy; Japanese banks

I. INTRODUCTION

The Japanese economy in the late 1980s was distinguished by a steep rise in asset prices. Japan at that time was recognized to have 'a bubble economy,' which was followed by crash in the stock and real estate markets, or 'the bursting of the bubble.'

During the post-bubble period of the 1990s, Japanese banks faced substantial difficulties, such as huge unperforming loans. More than ten banks, including one city bank (the Hokkaido Takushoku Bank) and two long-term credit banks (the Long-term Credit Bank of Japan and Nippon Credit Bank), failed or were temporarily nationalized in the late 1990s.

Although commentators often argued that surviving banks as well as these failed banks were managed in an irresponsible manner in the late 1980s, there is little empirical evidence. So, this paper provides empirical evidence to support this common argument by investigating how Japanese banks made cutbacks in the 1990s.

II. METHODOLOGY AND DATA

A. Methodology

Kang and Stulz (2000) proposed a simple way to test the bubble hypothesis regarding the stock market crash in Japan. They argued that if prices increased too much in the 1980s and the crash was a correction, then there should be a relationship between a firm's stock price increase in the second half of the 1980s (boom returns) and the fall of the stock price in the beginning of the 1990s (crash returns). They found that boom returns were significantly negatively correlated with crash returns.

We apply this test methodology to the branching behavior of Japanese banks. Concretely speaking, we test whether cities where many banks had opened their branches in the late 1980s experienced many closures of bank branches in the 1990s. As branching decisions are important long-term investment decisions for banks, it is inconceivable that a branch that a bank had deliberately opened would be closed soon thereafter. That is, if bank branching decisions in the late 1980s were reversed in the 1990s, we conclude that the cutbacks of Japanese banks in the 1990s may have been the result of 'irrational exuberance' during the bubble period.

B. Data

The Federation of Bankers Associations of Japan has published the number of branches of its member banks by city.[1] For example, there were 132 branches in Chiyoda-ku in Tokyo at the end of March 1999. For this study, we use data for 1985, 1990, 1995, and 1999.[2] As we exclude cities that lack relevant data, our sample consists of 769 observations for each year.

Then, we calculate the differences between 1985 and 1990, between 1990 and 1995, and between 1995 and 1999 for 769 cities. In the following analysis, these differences for city j for each period are abbreviated as $Dif9085_j$, $Dif9590_j$, and $Dif9995_j$, respectively.[3]

III. EMPIRICAL RESULTS

A. Descriptive Statistics

Table 1 shows basic statistics for $Dif9085_j$, $Dif9590_j$, and $Dif9995_j$. Among 769 cities, bank branches increased by an average of 0.93 during 1985 to 1990 (Period 1) and by 0.69 during 1990 to 1995 (Period 2). In contrast, bank branches decreased on average by 0.72 during 1995 to 1999 (Period 3). Bank branches increased in 314 cities during Period 1, while only 79 cities experienced bank branch increases during Period 3. In sum, Table 1 shows that banks as a whole expanded their operations in the late 1980s but reduced their operations in the late 1990s. However, this is not enough evidence to support the bubble hypothesis, because banks might have expanded their operations in some growing cities in the 1980s and have reduced their operations in other stagnant cities in the 1990s.

Table 1
Basic statistics

	$Dif9085_j$	$Dif9590_j$	$Dif9995_j$
Mean	0.925	0.694	-0.717
Median	0	0	0
Maximum	50	19	4
Minimum	-8	-15	-37
Std. Dev.	3.135	1.940	2.879
Observations	769	769	769
Positive	314	299	79
Zero	379	382	435
Negative	76	88	255

Note: $Dif9085_j$ denotes the change of bank branches in city j from 1985 to 1990. $Dif9590_j$ and $Dif9995_j$ are defined in the same way.

B. Estimation Results

I. Basic Results

As suggested by Kang and Stulz (2000), the bubble hypothesis indicates a negative relationship between branch changes in the late 1980s and those in the 1990s. Conversely, if banks expanded their operations in some growing cities in the 1980s and reduced their operations in other stagnant cities in the 1990s, a non-negative relationship between them is expected.

The following results were obtained through the Ordinary Least Square Method with 769 observations. The numbers in the parentheses are t-values.

$$\underset{}{Dif9995_j} = \underset{(-1.230)}{-0.090} - \underset{(-30.291)}{0.678}\ Dif9085_j, \quad adj\text{-}R^2=0.544 \qquad (1)$$

$$Dif9590_j = \underset{(8.100)}{0.579} + \underset{(5.697)}{0.125}\ Dif9085_j, \quad adj\text{-}R^2=0.039 \qquad (2)$$

$$Dif9995_j = \underset{(-6.199)}{-0.684} - \underset{(-0.881)}{0.047}\ Dif9590_j, \quad adj\text{-}R^2=-0.0003 \qquad (3)$$

Our main result is demonstrated by the first equation. In addition to a high R^2, the coefficient of $Dif9085_j$ is highly significantly negative. That is, cities that experienced larger increases in bank branches in the late 1980s were more likely to experience larger decreases in bank branches in the late 1990s. This is consistent with the bubble hypothesis that banks corrected their irrational behavior of the 1980s.

The second regression result demonstrates that there is a positive correlation between $Dif9085_j$ and $Dif9590_j$. This result suggests that many banks did not recognize the burst of the bubble and continued a business strategy that was not consistent with economic conditions for the post-bubble period.

II. Robustness Analysis

To confirm whether outliers unduly affected the results, we estimated the same equation excluding four major wards in Tokyo (Chuou-ku, Chiyoda-ku, Minato-ku, and Shinjyuku-ku), because they are Japanese nationwide financial centers.[4] The estimation results are as follows.

$$\underset{}{Dif9995_j} = \underset{(-4.842)}{-0.298} - \underset{(-11.531)}{0.331}\ Dif9085_j, \quad adj\text{-}R^2=0.147 \qquad (4)$$

$$Dif9590_j = \underset{(6.231)}{0.439} + \underset{(10.338)}{0.339}\ Dif9085_j, \quad adj\text{-}R^2=0.122 \qquad (5)$$

$$Dif9995_j = \underset{(-7.599)}{-0.503} - \underset{(-2.138)}{0.069}\ Dif9590_j, \quad adj\text{-}R^2=0.005 \qquad (6)$$

The results without these four financial centers remain qualitatively unchanged. Particularly, equation (4) coherently shows that the coefficient of $Dif9085_j$ is significantly negative.

Another test is performed. Here, we define a dummy variable, $SIGN1_j$, for city *j* for Period 1 (i.e., from 1985 to 1990) in the following manner. Let (1) $SIGN1_j$=+1 if $Dif9085_j$ is above the mean (i.e., 0.925), (2) $SIGN1_j$ =0 if $Dif9085_j$ is equal to the mean,

and (3) $SIGN1_j$ =-1 if $Dif9085_j$ is below the mean. $SIGN2_j$ and $SIGN3_j$ were defined in the same way.

Then, the equation is estimated. The results are as follows.

$$SIGN3_j = \underset{(9.76)}{0.310} - \underset{(-4.232)}{0.145}\, SIGN1_j, \quad adj\text{-}R^2=0.022 \tag{7}$$

$$SIGN2_j = \underset{(-5.148)}{-0.179} + \underset{(6.796)}{0.236}\, SIGN1_j, \quad adj\text{-}R^2=0.056 \tag{8}$$

$$SIGN3_j = \underset{(9.082)}{0.315} - \underset{(-2.816)}{0.098}\, SIGN2_j, \quad adj\text{-}R^2=0.009 \tag{9}$$

This test produces qualitatively the same results as before. Equation (7) suggests that cities that had experienced above-average branch increases in the late 1980s experienced below-average branch increases (in fact, large decreases) in the late 1990s. Other coefficients in (8) and (9) are the qualitatively same as in (2) and (3).[5]

Finally, we estimate the equation using rank measure. We give the rank, $RANKt_j$, to city *j* based on the changes of bank branches for the Period *t*= 1, 2, and 3. For example, $RANK1_j$=1 when *j* is Minato-ku (50 net branch increases in Period 1), and $RANK1_j$=2 when *j* is Chiyoda-ku (31 net branch increases).[6]

Estimation results are as follows.

$$RANK3_j = \underset{(17.401)}{285.5} - \underset{(-3.069)}{0.155}\, RANK1_j, \quad adj\text{-}R^2=0.011 \tag{10}$$

$$RANK2_j = \underset{(19.103)}{226.4} + \underset{(4.318)}{0.157}\, RANK1_j, \quad adj\text{-}R^2=0.022 \tag{11}$$

$$RANK3_j = \underset{(14.298)}{231.5} + \underset{(0.908)}{0.045}\, RANK2_j, \quad adj\text{-}R^2=-0.0002 \tag{12}$$

Consistent with the previous results, equation (10) demonstrates that the coefficient of $RANK1_j$ is significantly negative. The only qualitative difference is found regarding a positive coefficient of $RANK2_j$ in equation (12). However, it is not significant and does not force us to change our previous conclusion.

IV. CONCLUDING REMARKS

This paper finds that Japanese banks closed their branches in the late 1990s in cities where they had actively opened their branches in the late 1980s. This finding is very robust to several modifications of the relevant variables. This suggests that Japanese banks in the bubble period decided to establish branches without considering the fundamentals of the cities or, at least, they unduly overestimated the demand for bank business in those cities. Therefore, the recent cutback of Japanese banks is a correction

to the bubble of the late 1980s. Also, our results demonstrate that bank behavior in the early 1990s was similar to that of the late 1980s. Japanese banks as a whole put off correcting their irresponsible behavior until the late 1990s, when the Japanese banking crises grew worse and several major banks actually failed.[7] This delayed correction suggested that the market discipline of Japanese banks was very weak in the early 1990s.

Although our results seem very persuasive, it is worth investigating how individual banks behaved regarding their branch decisions. Such an investigation would result in important implications for bank supervision and regulations.

NOTES

1. Strictly speaking, Japan's eleven largest cities (Sapporo, Tokyo, Yokohama, Kawasaki, Nagoya, Kyoto, Osaka, Kobe, Hiroshima, Kita-Kyushu and Fukuoka) consisted of several wards in 1985. Regarding these cities, the Federation discloses the number of branches by ward. In this paper, we use the ward-based numbers for these cities, but, for simplicity, we mention 'city' instead of 'city and ward.'
2. The statistics before 1989 did not cover the mutual banks (i.e., "Sogo" banks), because the mutual banks were not the members of the Federation. So, for 1985, we add the number of branches of the mutual banks to the number that the Federation published.
3. Let the number of bank branches in city *j* in 1985 be N^{85}_{j}. N^{90}_{j} is defined in the same way. Then, $Dif9085= N^{90}_{j} - N^{85}_{j.}$
4. For example, these four wards were the first, second, third and fifth in the 1990 ranking regarding bank branches. Incidentally, Sendai was the fourth, but apparently it was not a national financial center.
5. Furthermore, a simple binary dependent model (increase=1, and decrease or unchanged =0) is estimated using a logit specification. This logit model estimation produces the qualitatively same results as (7), (8), and (9).
6. For example, when three cities recorded the same branch changes, we give them the same rank *R* and give the following cities the rank *R+3*.
7. All Japanese banks enjoyed 'too-big-to-fail' protection before 1995 and were immune from any market pressure and discipline. However, as the coverage of the protection became narrower during the financial crisis, banks were no longer exempt from market discipline. See Spiegel and Yamori (2000) for a more detailed discussion.

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