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Measuring the effect of postal saving privatization on Japanese banking industry: Evidence from the 2005 general election*

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Abstract

In this study, we empirically investigate the effect of the privatization of Japan's postal savings system, the world's largest financial institution, on the country's banking industry on the basis of the general election to the House of Representatives on September 11, 2005—essentially a referendum on the privatization of the postal system. Econometric results show that the privatization of postal savings system significantly raised the wealth of mega banks but not that of regional banks. Furthermore, it increased the risk of all categories of banks, and the banks that were dependent on personal loans increased their risk in response to the privatization of postal savings. These results suggest that incumbent private banks might seek new business or give loans to riskier customers whom they had not entertained before the privatization, to gear up for the new entry of Japan Post Bank (JPB), the newly privatized institution, into the market for personal loans. Hence, privatization of postal savings system probably boosted competition in the Japanese banking sector.

JEL Classification: G14, G21, G28

Keywords: Bank privatization, Postal savings system, Rival's reaction, Japan

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1. Introduction

Government ownership of banks is pervasive around the world (La Porta et al., 2002). State-owned banks are generally less efficient than private banks because they do not always pursue profit maximization but, instead, frequently operate on political and social considerations[1]. To improve the efficiency of state-owned banks, governments have promoted their privatization in many developing and developed countries since the late 1980s[2]. Most studies on bank privatization have confirmed that bank performance improved after privatization, more or less (Clarke et al., 2005). Furthermore, some studies have found, through intra-industry analyses, that bank privatization can increase competition in the banking sector (Otchere and Chan, 2003; Otchere, 2005, 2009; Chen et al., 2005).

Furthermore, in Japan, state-owned financial institutions have played important roles as financial intermediates. The postal savings system, a government-owned depository institution, collected huge funds from households. Postal deposits peaked at 260 trillion yen (about $2.4 trillion) in 1999, which corresponded to 37% of Japan's total household deposits (Imai, 2009a). On the other hand, as a result of the strong backing by the then prime minister Junichiro Koizumi, privatization of the postal system was formally accepted in October 2005, when the postal privatization bills were passed in the Diet. In October 2007, according to the privatization bills, the independent public corporation Japan Post, which managed the postal system, was divided into four companies: a postal savings bank, an insurance company, a mail delivery company, and a post office network management company. The first two companies (the postal savings bank and the insurance

[1] Recent studies provide much evidence of political influence on lending behaviors of state-owned banks (Sapienza, 2004; Dinc, 2005; Khwaja and Mian, 2005; Imai, 2009a).

[2] Numerous studies have dealt with bank privatization in various countries—especially the special issue of the *Journal of banking and finance* (issue no. 29, 2005), which includes cross-country, regional, and individual country studies of developing countries. With respect to developed countries, Otchere (2009) conducts cross-country analyses.

company,) would be fully privatized by 2017[3].

In this paper, we empirically investigate how the privatization of Japan's postal savings system, the world largest financial institution, could affect the country's banking industry[4]. In particular, we estimate its wealth and risk effects on the incumbent private banks in Japan, using the event study method. In the analyses, we use the general election to the House of Representatives on September 11, 2005, as the event. This election is considered to be a very valuable opportunity to measure the effect of the privatization of postal savings because it was essentially a referendum on the privatization of the postal system, including postal savings (Imai, 2009a). Moreover, following the election, the ruling Liberal Democratic Party (LDP) and its coalition partners had more than a key two-thirds majority in the House of Representatives, which immediately indicated that postal savings would certainly be privatized. We can understand the effect of privatization of postal savings system on the Japanese banking sector by observing the reaction of the stock prices of the incumbent private banks to the election result.

Econometric results indicate that the privatization of postal savings significantly raised the wealth of mega banks but not that of regional banks, which suggests that the larger banks gained a competitive advantage over Japan Post Bank (JPB), the new financial institution established following the privatization of postal savings. We also find that the privatization significantly increased the risk of all categories of banks. In addition, multivariate analyses show that the banks which depended on personal loans increased their risk in response to the privatization of postal savings, which suggests that these banks might seek new business or give loans to riskier customers

[3] As stated below, in December 2009, the opposition Democratic Party of Japan and its coalition partners formed the new government following their overwhelming victory in the general election of September 2009. They froze the planned sale of the shares of Japan Post Bank and Japan Post Insurance, which had already been decided upon in the postal privatization bills.

[4] Vollmer et al. (2009) conduct a case study on the privatization of Japan Post Bank. The study investigates the details of the institutional background and recent transformation of the Japanese postal savings system. On the other hand, it does not empirically analyze the effect of postal saving privatization on the Japanese banking industry.

whom they had not entertained before the privatization, to gear up for the JPB's new entry into the market for personal loans.

The remainder of this paper is organized as follows. Section 2 discusses the institutional background of the Japanese postal savings system. Section 3 explains our hypotheses. Section 4 describes the empirical methodology. Section 5 presents the empirical results. Section 6 concludes the study.

2. Institutional Background

The Japanese postal savings system, which was founded by the government in 1875, had established a nationwide network of post offices in both cities and rural areas for the purpose of collecting small savings[5]. One of the most remarkable characteristics of Japan's postal savings system is its large size compared to that of other countries. At the beginning of fiscal year 2005, when the privatization of postal savings was decided upon in the Diet, the amount of postal savings was 214 trillion yen ($2.0 trillion) and the number of post offices, over 24 000, which indicates that the Japanese postal savings system was the largest financial institution in the world. Figure 1 shows the amount of postal savings and bank deposits at the end of fiscal year 2004. It can be confirmed that postal savings occupied an overwhelming share of the deposit market in Japan. Further, the amount of postal savings was three times as large as the deposits of the Mizuho Financial Group, the then largest banking group in Japan. Therefore, the incumbent private banks were exposed to a direct competition with the postal savings system in cities and rural areas (Kuwayama, 2000; Imai, 2009a). The other characteristics of the Japanese postal savings system concern its asset side. Postal savings had been compulsorily channeled, through the Ministry of Finance, to government-affiliated institutions, local governments, and public corporations under the Fiscal Investment and Loan

[5] See Kuwayama (2000), Campbell and Porges, (2008), Imai (2009a), and Vollmer et al. (2009) for a more detailed institutional background of the Japanese postal savings system.

Program (FILP) for a long time[6]. On the other hand, it had been pointed out that the FILP fund had been invested for inefficient projects and non-viable borrowers on political considerations (Doi and Hoshi, 2003; Imai, 2009a). Therefore, the FILP system was reformed in April 2001 to introduce market discipline in fund allocation. By the FILP reform, postal savings were to be discretionally invested on the financial markets. However, the channeling of funds from postal savings to government agencies did not greatly change even after this because the return on the FILP account was guaranteed by the Ministry of Finance to be higher than that on Japanese Government Bonds (Hirata et al., 2005).

A full-fledged debate on privatization of the postal savings system started in the Administrative Reform Council under the Hashimoto cabinet in the late 1990s, and Junichiro Koizumi earnestly undertook the privatization against the backdrop of his national popularity after he became prime minister in 2001 by winning a convincing victory in the LDP presidential election[7]. By spring 2005, the Koizumi cabinet framed the postal privatization bills through the Council on Economic and Fiscal Policy initiated by him. The postal privatization bills stipulated that the postal system would be split into four separate companies: a postal savings bank, an insurance company, a mail delivery company, and a post office network management company; the first two companies would be fully privatized by 2017[8]. The bills faced strong opposition from not only the opposition parties but also some of the LDP members, called the "postal lobby," who derived political and financial support from the postal bureaucracy and the association of postmen. Consequently, although the LDP and its coalition partner New Komeito held a majority in both House of Representatives and House of

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[6] See Iwamoto(2002), Cargill and Yoshino(2003) Kaneko and Moteki (2008) and Imai(2009b) for more detailed institutional background of the Fiscal Investment and Loan Program (FILP).

[7] Although the Administrative Reform Council released the reports to encourage postal privatization, the anti-privatization LDP members strongly opposed it (Amyx et al.(2005)).

[8] The content of the postal privatization bill had been watered down due to many compromises with anti-privatization LDP members, compared to the proposal released in September 2004 (Imai, 2009a).

Councillors, the postal privatization bills were voted down in the House of Councillors on August 8, 2005, due to opposing votes cast by the anti-privatization LDP members[9]. In response to the defeat of the bills in the House of Councillors (which could not be dissolved), Koizumi dissolved the House of Representatives and called for a snap election to seek the judgment of the Japanese people on postal privatization[10].

In the election campaign, since Koizumi did not give official party endorsement to the rebellious members who voted against the postal bills, he succeeded in making voters pay attention to the postal privatization issue. Therefore, the election to the House of Representatives held on September 11, 2005, was essentially a referendum on the postal privatization bills (Imai, 2009a)[11]. In the election, Koizumi's LDP won an overwhelming victory with the then largest share in postwar politics[12]. Furthermore, the LDP and its coalition partner New Komeito had a key two-thirds majority in the House of Representatives, which indicated that they could effectively pass legislative bills without the consent of the House of Councillors. Soon, the postal privatization bills were passed in both House of Representatives and House of Councillors in October 2005.

The postal privatization scheme began in October 2007. According to the postal privatization bills, the independent public corporation Japan Post, which managed the postal system, was divided into four stock companies, namely, Japan Post Network (post office network management), Japan Post Service (mail service), Japan Post Bank (depository service), and Japan Post Insurance (insurance service), which were subsidiary companies of the government-owned holding company

[9] On July 5, 2005, the House of Representatives passed the bills by a vote of 233 to 228, although 51 LDP members did not vote for the bills. Subsequently, in the House of Councillors, the bills were rejected by a vote of 125 to 108; 30 out of 114 LDP members opposed the bills.

[10] To put pressure on the anti-privatization LDP members before submitting the bills to the Diet, Koizumi pledged to dissolve the House of Representatives and call for a snap election if they were rejected. Furthermore, he vowed not to give party endorsement to the defeaters, in the subsequent election.

[11] New York Times, September 11, 2005. "Koizumi succeeded in framing the election simply as a referendum on selling part of the postal system and on domestic issues."

[12] LDP obtained 296 out of 480 seats, and New Komeito won 31 seats in the election.

Japan Post Holding[13]. Among them, Japan Post Bank and Japan Post Insurance will be completely privatized by 2017. The first sale of shares was planned for as early as fiscal year 2010. However, the movement of postal privatization underwent a major change in 2009. In the election to the House of Representatives in August 2009, the opposition DPJ defeated the then ruling coalition of LDP and New Komeito in a landslide victory that led to a regime change. Thus, DPJ became the new ruling party in a coalition with the Social Democratic Party (SDP) and the People's New Party (PNP)[14]. The new ruling parties adopted the policy of reexamining postal privatization. In an extraordinary session of the Diet in December 2009, DPJ and its coalition partners (SDP and PNP) used their majority to pass a law freezing the planned sale of the shares of Japan Post Bank and Japan Post Insurance, without specifying any explicit date to call it off.

3. Hypothesis

In this section, we consider the effect of the privatization of postal savings system on the wealth and risk of incumbent private banks, referring to the extant literature investigating the intra-industry effect of bank privatization (Otchere and Chan, 2003; Otchere, 2005, 2009; Chen et al., 2005). With respect to the wealth effect, both of positive and negative interpretations are possible. As for the negative effect, privatization promotes competition because newly privatized firms are likely to operate more efficiently and aggressively than they did under government ownership. Consequently, privatization could hurt the wealth of rival banks' shareholders. Otchere (2005) calls this the "competitive effect." The competitive effect is generally confirmed in previous studies. Furthermore, in the case of postal privatization in Japan, the newly privatized institution (Japan Post Bank) would be gradually permitted to enter new businesses such as corporate loans or mortgages, which they

[13] Japan Post Holding was planned to go public as soon as possible. However, the Japanese government was obligated to hold not less than one-third of its share.
[14] DPJ obtained 308 out 480 seats in the election. Consequently, DPJ and its coalition partners (SDP and PNP) held a majority in both House of Representatives and House of Councillors.

were not allowed to undertake before privatization[15]. Therefore, if the newly privatized institution succeeds in entering new businesses, it will hurt the profit of incumbent private banks. On the other hand, several interpretations about the possible positive effects of privatization on rival banks are also offered[16]. In particular, the loss of non-competitive incentives such as tax cuts and subsidies is likely to have an important effect in our case, because Japan's postal savings system had enjoyed large tax cuts and subsidies before privatization. According to Hirata et al. (2005), postal savings enjoyed tax cuts and subsidies equivalent to 802.5 billion yen in fiscal year 2004, which corresponds to 66.3% of the net earnings from postal savings in that fiscal year[17]. JPB, the newly privatized institution, would lose these non-competitive incentives after privatization, which could hurt its competitive position. Thus, the privatization of postal savings could increase the wealth of rival banks' shareholders.

Both positive and negative interpretations are offered for the risk effect as well. Numerous theoretical literatures show that increased competition erodes the franchise value of banks, which encourages them to take riskier policies in order to maintain their rents (Chan, Greenbaum and Thakor,1986; Keeley,1990; Besanko and Thakor,1993; etc.)[18]. Therefore, if competition is more intense due to improved efficiency of JPB or its new entry into loan market after privatization, they may serve riskier customers or enter new high-risk and high-return business. In this case, their risk

[15] According to the postal privatization bills, JPB would be gradually allowed by the Japan Postal Privatization Committee to enter new businesses, depending on the extent to which privatization would progress.

[16] Otchere (2005) gives four possible explanations for the positive valuation of rival firms as *positive information effects*: (1) privatization leads to the deregulation of the banking industry, (2) the presence of a newly privatized bank attracts more analyst attention to the banking industry, (3) the positive gains of a privatized bank spread to rival banks (shot in the arm), and (4) the loss of non-competitive incentives has an effect, as explained above.

[17] According to table 1-42 of Hirata et al. (2005), the tax cuts and subsidies break down into an exemption of deposit insurance premium, an exemption of stamp tax, and a subsidy for FILP accounts.

[18] Also, there are many empirical studies which support the positive relation between bank competition and risk-taking (Demsetz, Saidenberg and Strahan,1996; Hellman, Murdock and Stiglitz, 2000; Salas and Saurina, 2003; etc.).

will increase. On the other hand, if the newly privatized institution (JPB) wins a significant share of loans from rival banks, the ratio of their risk assets to their portfolio will decrease, which implies the risk of private banks will decrease[19]. Therefore, the effect of privatization on the risk of rival banks is not clear a priori.

4. Empirical Methodology

4.1 Measuring the effect of postal saving privatization on private banks in Japan.

In this section, we consider the model to measure the effect of privatization of postal savings system on rival private banks in Japan. However, it is not always easy to measure the effect of regulatory events such as privatization because generally the legislative process of privatization or other regulatory events is complex and includes various events leading up to the final passage of the law. Therefore, previous research on bank privatization, such as Otchere and Chan (2003) and Chen et al. (2005), selected several key events considered to be potentially important, and estimated their effects on private banks. On the other hand, this paper focuses on the election to the House of Representatives on September 11, 2005. We consider this election as an ideal event to measure the effect of the privatization of postal savings on the Japanese banking sector for three reasons. First, as stated above, this election was carried out because the then prime minister Koizumi (the president of LDP) dissolved the House of Representatives in response to the rejection of his postal privatization bills in the House of Councillors on August 8, 2005, so postal privatization essentially became a central issue during this election. Second, the factors in the LDP manifesto, which could affect the banking sector directly, were limited to postal privatization[20]. Third, the LDP and its coalition

[19] In addition, a recent theoretical study also proposed a negative relation between bank competition and risk. Boyd and De Nicolo (2005) show that banks in less competitive market charge higher interest rates on loans, which encourages borrowers to choose riskier projects as a result of moral hazard.

[20] Although the LDP manifesto also included the reform of government financial institutions, its direction or detailed plan was not proposed in it.

partner New Komeito had a key two-thirds majority in the House of Representatives as a result of their overwhelming victory, which indicated that they could effectively pass the postal privatization bills without the consent of the House of Councillors. The media and experts could hardly predict such a landslide victory for the LDP, although some of them had predicted that the party was slightly ahead of the DPJ[21]. Therefore, we can grasp the effect of the privatization of postal savings on the Japanese banking sector by observing how stock prices of private banks reacted on the next day of the election (September 12, 2005)[22].

To measure the effect of postal privatization, this paper uses the event study method. As stated by Otchere and Chan (2003) and Chen et al. (2005), privatization is a regulatory event that could affect rival firms contemporaneously. Therefore, the event of the privatization of postal savings was likely to affect rival private banks contemporaneously. To control for such a contemporaneous shock, we use the following SUR (seemingly unrelated regression) model:

$$
\begin{aligned}
R_{1t} &= \alpha_1 + \beta_1 R_{mt} + \gamma_1 I_t + \lambda_{11} D_{1t} + \lambda_{12} D_{2t} R_{mt} + \lambda_{13} D_{2t} + u_{1t} \\
R_{2t} &= \alpha_2 + \beta_2 R_{mt} + \gamma_2 I_t + \lambda_{21} D_{1t} + \lambda_{22} D_{2t} R_{mt} + \lambda_{23} D_{2t} + u_{2t} \\
R_{3t} &= \alpha_3 + \beta_3 R_{mt} + \gamma_3 I_t + \lambda_{31} D_{1t} + \lambda_{32} D_{2t} R_{mt} + \lambda_{33} D_{2t} + u_{3t} \qquad (1) \\
&\vdots \quad \vdots \quad \vdots \quad \vdots \quad \vdots \quad \vdots \quad \vdots \\
R_{it} &= \alpha_i + \beta_i R_{mt} + \gamma_i I_t + \lambda_{i1} D_{1t} + \lambda_{i2} D_{2t} R_{mt} + \lambda_{i3} D_{2t} + u_{it}
\end{aligned}
$$

where R_{it} indicates the daily return of bank i in period t, and R_{mt} is the return on the market index in

[21] One reason is that in the election to the House of Representatives, 300 seats out of 480 were elected by the single-member constituency system, which probably causes the difference between the percentage of votes obtained by a certain party and the number of seats obtained by it. Actually, although LDP obtained 47.77% of the total votes in single-member constituencies, it obtained 219 seats out of 300.

[22] Since the election day (September 11, 2005) was a Sunday, the stock market was closed. Further, the election result was known by early next morning (September 12, 2005).

period t. We use the Tokyo Stock Exchange Price Index (TOPIX) as the proxy for the market index[23]. I_t is the change of a default-free debt index on t[24]. The Nikkei JGB Index is used as the proxy for this variable. D_{1t} is a dummy, which equals one on the event day (September 12, 2005) and zero on other days. The coefficient of this variable (λ_{i1}) will capture the abnormal returns of incumbent private banks. D_{2t} is a dummy variable, which equals one on all post-event days. Therefore, the coefficient of the interaction term between D_{2t} and R_{mt} (λ_{i2}) is expected to capture the change of systematic risk during the post-event days. The coefficient of the dummy variable D_{2t} (λ_{i3}) is expected to capture the cumulative abnormal return during the post-event days.

We employ two estimation periods, namely, the period from t = −150 to t = 0 (151 trading days), and the period from t = −150 to t = +50 (201 trading days). In the second period, we lose most of the data of post-event day on the mega bank group UFJ because its stock was delisted on September 27, 2005, due to its consolidation with the Mitsubishi Tokyo Financial Group (MTFG). Then, we remove it from the sample banks in the second period. In the first period, we can include the UFJ group, but cannot estimate the change of systematic risk (λ_{i2})[25]. Therefore, we conduct regression in both the first and second periods.

In Eq. (1), we are especially interested in the parameters λ_{i1} and $\lambda_{i2,}$ which capture the abnormal return and the change in systematic risk, respectively. If the privatization of postal savings system has a negative effect on the future profitability of rival private banks, the parameter λ_{i1} is expected to be negative, which is consistent with the competitive effect hypothesis. With respect to the change in

[23] Otchere and Chan (2003) include the lead and lag variables of R_{mt} to correct non-synchronous trading because stocks of some banks might not be traded frequently. On the other hand, since the Tokyo Stock Exchange, where our sample banks were listed, was the second largest stock exchange in the world, such a problem does not matter at least during our sample period.

[24] If we use the change in interest rate orthogonalized with respect to the return on the market index, as is used in Otchere and Chan (2003) and Chen et al. (2005), the estimated results are not changed at all.

[25] The stock of UFJ Holdings was delisted due to its consolidation with the Mitsubishi Tokyo Financial Group on September 27, 2005, the eighth trading day from the event day. It is probably difficult to precisely estimate the effect of systematic change only during 8 days.

systematic risk, if the rival private banks become more competitive and increase their risks in response to the privatization of postal savings system, the parameter λ_{i2} is expected to be positive. On the other hand, if the private banks become less competitive and decrease their risks, it is expected to be negative.

Following Otchere and Chan (2003), we conduct a Wald test to investigate the effects of the privatization of postal savings system on the banking industry as a whole. That is, we examine whether the sum of abnormal returns of rival banks is significantly different from zero by testing whether $\sum_{i=1}^{N} \lambda_{i1} = 0$, where N is the number of rival banks (intra-industry wealth effect). On the other hand, the reaction of rival banks to the privatization of postal savings system may differ according to their competitive environment against postal savings. Therefore, we examine whether the abnormal returns are heterogeneous, which is defined as the *differential information effect* by Otchere and Chan (2003); that is, we test whether $\lambda_{11} = \lambda_{21} = \ldots\ldots\ldots = \lambda_{N1}$. In addition to the abnormal return (λ_{i1}), we conduct the same Wald tests with respect to the change in systematic risk (λ_{i2}). Furthermore, we conduct Wilcoxon signed rank test whether the median is different from zero.

4.2 Data and samples

Our estimation period is from February 3, 2005, to November 28, 2005, as stated above[26]. We select 83 sample banks, which had complete stock price data during the estimation period. These sample banks consist of 8 city and 75 regional banks. In the following analysis, the city banks are classified into two categories, the mega bank groups and other city banks. The mega bank groups have nationwide branch networks, principally in metropolitan and major cities, and consist of the Mizuho Financial Group (Mizuho), the Mitsubishi Tokyo Financial Group (MTFG), the Sumito Mitsui Financial Group (SMFG), and the UFJ Holdings (UFJ). Other city banks consist of three trust

[26] The estimation period is from February 3 to September 12, 2005, comprising 151 trading days.

banks (Chuo-Mitsui Trust, Sumitomo Trust, and Mizuho Trust) and the Shinsei Bank, which mainly have branch networks in metropolitan and major cities[27].

The main data for this paper is sourced from the Nikkei NEEDS–Financial Quest, which provides stock market and accounting data of banks. The outstanding balances of postal savings per prefecture are gathered from Japan Post's website[28]. Also, the outstanding deposits in each category of banks (city banks, regional banks, and shinkin banks) per prefecture are obtained from Finance Map 2005 (Monthly Finance Journal, special issue) issued by Nikkin Co.

5 Empirical Results

5.1 Event study results

In Table 1, we present the estimation results of abnormal returns and changes in risk. Panels A, B, and C report the results of city banks, regional banks, and all banks, respectively. Column 1 shows the results for the abnormal return of the event day (September 12, 2005) for the 151-day estimation period (−150, 0 window). From panel A, we can confirm that all mega banks respond positively to the results of the election to the House of Representatives. Mizuho (the then largest private bank) experienced a 2.7% daily gain, which is statistically significant at the 1% level. Further, the mean abnormal return of all mega banks is 1.94%, and the hypothesis that there is no intra-industry wealth effect is rejected at the 5% significance level ($\chi^2 = 4.90$) by the Wald test. These results indicate that the mega banks would benefit from the privatization of postal savings system. With respect to other city banks (the three trust banks and Shinsei Bank), the estimated mean abnormal return is also positive (0.75%). However, the hypothesis that there is no intra-industry wealth effect is not rejected by the Wald test. In addition, with respect to all city banks, the mean

[27] Shinsei Bank is the successor of the Long-Term Credit Bank of Japan, which specialized in long-term financing to various industries and was nationalized in 1998 due to bad loans.
[28] http://www.japanpost.jp/toukei/

abnormal return is positive and statistically significant by the Wald test. These results are not consistent with the competitive effect hypothesis. One interpretation of these results is that JPB, the newly privatized institution would be less competitive than the city banks, especially the mega banks, because after privatization it would lose the various advantages it enjoyed from the government.

In panel B, it can be confirmed that the mean abnormal return in all regional banks is negative (−0.22%), which is consistent with the competitive effect hypothesis. That is, the privatization hurt the wealth of regional banks because they would be exposed to fierce competition with JPB. However, the effect is not necessarily strong, because while the effect is statistically significant at 10% level, based on the Wilcoxon signed rank test, it is not significant based on the Wald test (χ^2 = 0.14). In the bottom of panel B, the abnormal returns for the three largest regional banks are presented. There, it can be confirmed that Chiba Bank (1.93%) and Shizuoka Bank (3.36%) had significantly positive abnormal returns. On the other hand, although not reported in panel B, we confirmed that the abnormal returns of 17 regional banks—22.6% of the total number—are less than −1%[29]. Therefore, the reaction of regional banks to the privatization of postal savings system is heterogeneous. Indeed, the hypothesis that the regional banks react homogenously to the privatization of postal savings ($\lambda_{11} = \lambda_{21} = \ldots\ldots = \lambda_{N1}$) is statistically rejected at the 1% significance level. With respect to all banks (see panel C) also the above hypothesis is statistically rejected.

Column 2 presents the estimated results of changes in systematic risk for the 201-day estimation period (−150, +50 window)[30]. We can confirm the positive change in risk for all categories of banks, namely, mega banks, other city banks, and regional banks. Furthermore, the hypothesis that that there is no intra-industry risk effect ($\sum_{i=1}^{N} \lambda_{i2} = 0$) is statistically rejected for all categories of banks. Therefore, the privatization of postal savings system had the effect of raising the

[29] Among these 17 banks, there were 5 whose abnormal returns are statistically significant at the 10% significance level.

[30] The estimated results of abnormal returns (λ_1) for 201-days are quite similar with those of column 1 (151-days estimation period), although not reported in the table.

risk of private banks. Furthermore, to check robustness, we further estimated Eq. (1) with respect to the contracted (−150, +30) and expanded (−150, +70) estimation periods. We confirmed that the estimated results are rarely changed, although not reported in Table 1.

Furthermore, we estimated the abnormal returns with respect to the expanded event windows. Column 3 presents the estimated results of cumulative abnormal returns for a 3-day event window (0, +2)[31]. We can also confirm that the abnormal returns are positive for city banks and negative for regional banks. However, the effect of privatization for all categories of banks became weaker than the event day effect (column 1). Further, similar results were confirmed when the 2-day event window (0, +1) was used (not reported in the table). Therefore, it is inferred that the effect of privatization is strongly reflected in the stock market on the event day (September 12, 2005)[32].

In summary, the privatization of postal savings system significantly raised the wealth of mega banks, which is contrary to the hypothesis of competitive effect observed in most of the previous research. One of interpretations for this result is that JPB would be less competitive than the city banks, especially the mega banks, because it would lose various advantages from the government after its privatization. On the other hand, with respect to the regional banks, the privatization of postal savings did not have a strong effect on their wealth, which suggests that regional banks did not obtain stronger competitive advantage against JPB than mega banks did. It may reflect the difference in the competitive environment against the postal savings system between the city banks and the regional banks. That is, regional banks were more exposed to competition with the postal saving system in the regional markets than were the city banks. In addition, the abnormal returns of regional banks are significantly heterogeneous. Hence, we need to investigate the details about the determinants of abnormal returns by cross-sectional analysis (we conduct it in the next sub-section).

[31] In the regression, the estimation periods was 153 trading days during the period from t = −150 to t = +2.

[32] Furthermore, we estimated the abnormal returns on the pre-event day. They were not significant even in the sample of the mega bank groups.

Furthermore, the privatization significantly increased the risk of all categories of banks, which indicates that privatization of postal savings system was likely to boost competition in the Japanese banking sector. One interpretation for this result is that the rival banks might increase their risk by seeking new business opportunities because after the privatization the newly privatized institution (JPB) would be admitted to new business, for instance, corporate loans, personal loans, or mortgages, which were not allowed before privatization[33].

5.2. Multivariate analyses

Next, we investigate the determinants of the rival banks' abnormal returns and the change in risk by using several explanatory variables. The following equation is estimated for the incumbent private banks.

$$\lambda_{ij} = \beta_0 + \beta_1 PS\_Share_i + \beta_2 P\_Loan_i + \beta_3 Size_i + \beta_4 F\_Ratio_i + u_i \quad (j=1,2) \qquad (2)$$

where the dependent variable indicates the abnormal return on the event day (λ_{i1}) and the change in risk (λ_{i2}) of bank i. With respect to the explanatory variables, PS_Share_i is the ratio of postal savings deposits to total deposits (postal savings deposits + private banks deposits) in the prefecture where bank i operates[34]. This variable is used as a proxy for the dominance of postal savings in the prefecture. The extent of dominance of postal savings is quite different among prefectures[35]. Therefore, the effect of privatization on the wealth and risk of private banks also could be different among the prefectures. P_Loan_i is the ratio of personal loans to total loans, which is used as a proxy

[33] Small personal loans collateralized by government bonds or postal saving were partially allowed before the privatization.
[34] Private bank deposits include deposits of shinkin banks. The average across prefectures is used as the value of PS_share_i of city banks.
[35] While the highest value of PS_share_i is 0.3790 (in Kagoshima), the lowest is 0.1084 (in Tokyo).

for similarity in the type of business[36]. Since the postal savings system had specialized in serving individual deposit customers before the privatization, the newly privatized firm (JPB) is expected to immediately enter the business of personal loans after the privatization.[37] Therefore, the privatization is expected to significantly affect the banks that were heavily involved in personal loans. *Size* is the natural log of total assets considered to serve as a proxy for management resources in the competition against the newly privatized institution JPB. Since JPB will be the largest bank in term of deposits, it is likely to enjoy more economies of scale after privatization. Therefore, small banks with poor management resources might lose their customers. F_Ratio_i indicates the financial performance of each bank. We use the returns on equity (*ROE)* and the debt to equity ratio (*DE_Ratio*), following Chen et al. (2005). The basic statistics and correlation matrix are reported in Appendix Tables 1 and 2.

Table 2 presents the results of regression of abnormal returns with respect to all private banks. In column 1, the coefficient of bank size is positive and statistically significant at the 1% level, which indicates that larger banks experienced higher abnormal returns just after postal privatization was formally decided. Column 2 confirms the negative coefficient of PS_Share_i, indicating that banks operating in the prefectures where the postal savings system was dominant experienced lower abnormal returns, which is consistent with the competitive effect hypothesis. In column 3, the coefficient of P_Loan_i is positive, but not statistically significant. In column 4, the coefficient of PS_Share_i is still negative and statistically significant after controlling for bank size. Column 5, where all variables are included, shows that while the statistical significance of the coefficient of PS_Share_i disappears, the coefficient of *Size* is still positive and statistically significant at 1%.

[36] Personal loans consist mostly of mortgages.

[37] Actually, JPB immediately applied for entry to the business of mortgages as soon as the scheme of postal privatization started in October 2007. However, it has not been allowed yet because the process of privatization was stopped by the new ruling parties (DPJ, SDP, and PNP) in December 2009, as stated in section 2.

Therefore, this evidence indicates that bank size is very important in competing with the postal savings system after its privatization.

The result of Table 2 may principally reflect the difference of institutional structures between the city banks and the regional banks. Therefore, it deserves exploring how the abnormal returns are determined among the regional banks, which would compete with JPB more intensely. Table 3 shows the results of abnormal returns with respect to the regional banks. We can confirm that the results are similar to those of Table 2. That is, the coefficient of *PS_Share* is still negative and statistically significant in columns 2 and 4, which suggests that banks operating in the areas where the postal savings system had been dominant would face a threat to their future profits after its privatization. Further, bank size has a strong positive effect in all regressions, indicating that large regional banks would have a greater advantage than small regional banks in their competition with JPB.

The estimated results of the change in risk (λ_{i2}) for all banks are reported in Table 4. Compared with the results of abnormal returns (Tables 2 and 3), PS_Share_i no longer has strong effects. On the other hand, the coefficient of P_Loan_i is positive and statistically significant, which indicates that the banks that were dependent on personal loans increased their risk in response to the privatization of the postal savings system. One interpretation of this result is that those banks might seek new business or give loans to riskier customers whom they had not entertained before privatization to gear up for the competition with JPB in the market for personal loans. In other words, the decline of franchise value accompanied by the entry of JPB into personal loan market was likely to encourage them to pursue riskier policies. This result is consistent with Konishi and Yasuda (2004) which empirically examine the determinants of risk taking at Japanese banks during the 1990-1999 period. They find a negative correlation between several factors of bank risk and franchise value measured

by Keeley's Q (Keeley, 1990)[38]. Table 5 shows the results of the change in risk for regional banks. It generally confirms that the results are similar to those of Table 4. That is, the coefficient of P_Loan_i is positive and statistically significant, which indicates that the regional banks that were dependent on personal loans increased their risk more than those that were less dependent on personal loans.

6. Conclusion

In this study, we empirically investigate the effect of the privatization of postal savings on the Japanese banking industry, using the event study methodology. In the analyses, we focus on the general election to the House of Representatives on September 11, 2005, which was essentially a referendum on the privatization of the postal system. Econometric results show that the privatization of postal savings system significantly raised the wealth of mega banks but did not have a strong effect on the wealth of regional banks, which suggests that larger banks relatively gain competitive advantages against a newly privatized institution (JPB). We also find that the privatization significantly increased the risk of all categories of banks. Furthermore, multivariate analyses show that banks that were dependent on personal loans increased their risk in response to the privatization of the postal savings system. Hence, it seems that those banks might seek new business or give loans to riskier customers whom they had not entertained before the privatization as they prepare to compete with JPB in the market for personal loans. In this sense, the privatization of postal savings is likely to boost competition in the Japanese banking sector.

Finally, it should be noted that this paper examines the short-term effect of the privatization of postal savings. On the other hand, it is also important to investigate its longer-term effects because privatization will be a long-standing process. Unfortunately, it is difficult to investigate this at the moment because, as stated above, in December 2009, the new ruling DPJ and its coalition partners

[38] They use the sum of market value equity and the book value of liabilities divided by the book value of assets as Keeley's Q.

froze the planned sale of shares in Japan Post Bank; the shares have not been sold in the stock market yet. Therefore, the analysis of the longer-term effects of postal privatization remains an objective of future research.

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Table1 Private banks' share price response to postal saving privatization

	[1] AR[0] λ1		[2] Change in risk λ2		[3] CAR[0, +2] λ1	
	AR(%)/Stat	P-value	Δβ/Stat	P-value	CAR(%)/Stat	P-value
Panel A: City banks						
Mega bank (4)						
MTFG	1.18%	(0.225)	0.725	(0.004)***	0.04%	(0.946)
Mizuho	2.74%	(0.009)***	0.848	(0.000)***	0.64%	(0.298)
SMBC	2.33%	(0.039)**	0.629	(0.009)***	0.83%	(0.204)
UFJ	1.52%	(0.202)	-		0.45%	(0.365)
Mean (All mega banks)	1.94%		0.734		0.49%	
Positive/Negative	4/0		3/0		4/0	
$\chi 2$ statistics $\Sigma \lambda = 0$	4.90	(0.027)**	13.740	(0.000)***	0.92	(0.338)
$\chi 2$ statistics $\lambda = \lambda = \cdots = \lambda$	3.52	(0.319)	1.050	(0.590)	2.77	(0.428)
Wilcoxon	1.83	(0.068)*	1.604	(0.109)	1.83	(0.068)*
Other city bank(4) (Trust banks and Shinsei banks)						
Mean (Other city banks)	0.75%		0.4727		0.04%	
Positive/Negative	3/1		4/0		1/3	
$\chi 2$ statistics $\Sigma \lambda = 0$	0.85	(0.356)	6.350	(0.007)***	0.01	(0.928)
$\chi 2$ statistics $\lambda = \lambda = \cdots = \lambda$	1.46	(0.691)	7.570	(0.055)*	1.51	(0.680)
Wilcoxon	1.46	(0.144)	1.826	(0.068)*	-0.37	(0.715)
All city banks (8)						
Mean (All large banks)	1.35%		0.5847		0.27%	
Positive/Negative	7/1		7/0		5/3	
$\chi 2$ statistics $\Sigma \lambda = 0$	3.02	(0.082)*	11.760	(0.000)***	0.35	(0.554)
$\chi 2$ statistics $\lambda = \lambda = \cdots = \lambda$	9.16	(0.241)	10.390	(0.010)***	5.53	(0.595)
Wilcoxon	2.83	(0.017)*	2.366	(0.018)**	1.26	(0.207)
Panel B Regional banks						
All regional banks (75)						
Mean (All regional banks)	-0.22%		0.558		-0.11%	
Positive/Negative	29/46		71/4		24/51	
$\chi 2$ statistics $\Sigma \lambda = 0$	0.14	(0.706)	16.400	(0.000)***	0.11	(0.741)
$\chi 2$ statistics $\lambda = \lambda = \cdots = \lambda$	130.15	(0.000)***	380.430	(0.000)***	201.29	(0.000)***
Wilcoxon	-1.93	(0.054)*	7.129	(0.000)***	-3.14	(0.001)***
Large Regional banks (3)						
Yokohama Bank	-0.02%	(0.983)	0.784	(0.001)***	-0.20%	(0.752)
Chiba Bank	1.93%	(0.097)*	0.783	(0.003)***	-0.18%	(0.790)
Sizuoka Bank	3.36%	(0.000)***	0.444	(0.013)**	-0.07%	(0.900)
Panel C All banks						
All banks(83)						
Mean (All banks)	-0.07%		0.560		-0.07%	
Positive/Negative	36/47		78/4		29/54	
$\chi 2$ statistics $\Sigma \lambda = 0$	0.02	(0.900)	19.450	(0.000)***	0.06	(0.809)
$\chi 2$ statistics $\lambda = \lambda = \cdots = \lambda$	156.77	(0.000)***	443.030	(0.000)***	226.94	(0.000)***
Wilcoxon	-0.85	(0.396)	7.496	(0.000)***	-2.60	(0.009)***

Significance at 1%,5% and 10% level are denoted by "***" "**" and "*".

Table2 Cross sectional regressions of private banks' returns (All banks)

	Dependent Variables Abnormal Returns (**AR[0]**): λ 1				
	[1]	[2]	[3]	[4]	[5]
Size	0.0060***			0.0054***	0.0056***
	(0.0009)			(0.0010)	(0.0012)
PS_share		−0.0800***		−0.0496**	−0.0409
		(0.0219)		(0.0231)	(0.0261)
P_Loans			0.0256		0.0255
			(0.0165)		(0.0177)
ROE					0.0032
					(0.0151)
DE_ Ratio					−0.0000
					(0.0002)
Intercept	−0.0905***	0.0230***	−0.0080*	−0.0672***	−0.0807***
	(0.0143)	(0.0069)	(0.0047)	(0.0184)	(0.0224)
NOB	83	83	83	83	83
R2	0.273	0.101	0.026	0.310	0.336

Significance at 1%,5% and 10% level are denoted by "***" "**" and "*".
The figures in parentheses are heteroskedasticity-robust standard errors.

Table3 Cross sectional regressions of private banks' returns (Regional banks)

	Dependent Variables Abnormal Returns (**AR[0]**): λ 1				
	[1]	[2]	[3]	[4]	[5]
SIZE	0.0059***			0.0058***	0.0063***
	(0.0021)			(0.0021)	(0.0022)
PS_share		−0.0531**		−0.0514**	−0.0438
		(0.0243)		(0.0243)	(0.0291)
P_Loans			0.0282		0.0297
			(0.0182)		(0.0190)
ROE					−0.0078
					(0.0191)
DE_ Ratio					−0.0000
					(0.0002)
Intercept	−0.0897***	0.0138*	−0.0104**	−0.0731**	−0.0898**
	(0.0304)	(0.0077)	(0.0052)	(0.0312)	(0.0346)
NOB	75	75	75	75	75
R2	0.121	0.050	0.035	0.168	0.202

Significance at 1%,5% and 10% level are denoted by "***" "**" and "*".
The figures in parentheses are heteroskedasticity-robust standard errors.

Table4 Cross sectional regressions of changes in risk (All banks)

	Dependent Variables Changes in risk (λ 2)				
	[1]	[2]	[3]	[4]	[5]
SIZE	0.0728**			0.0792**	0.0601*
	(0.0333)			(0.0358)	(0.0360)
PS_share		−1.4058			−0.5347
		(0.8529)			(0.9467)
P_Loans			1.0903**	1.1642***	0.9016**
			(0.4453)	(0.4302)	(0.4364)
ROE					0.7395
					(0.9636)
DE_ Ratio					0.0037
					(0.0062)
Intercept	−0.5304	0.9760***	0.2460*	−0.9627*	−0.5759
	(0.5204)	(0.2451)	(0.1280)	(0.5420)	(0.6726)
NOB	82	82	82	82	82
R2	0.036	0.031	0.048	0.090	0.118

Significance at 1%,5% and 10% level are denoted by "***" "**" and "*".
The figures in parentheses are heteroskedasticity-robust standard errors.

Table5 Cross sectional regressions of changes in risk (Regional banks)

	Dependent Variables Changes in risk (λ 2)				
	[1]	[2]	[3]	[4]	[5]
SIZE	0.1317*			0.1468**	0.1454*
	(0.0676)			(0.0685)	(0.0750)
PS_share		−1.5120*			−0.8434
		(0.9063)			(1.0241)
P_Loans			1.1238**	1.2609***	0.8615*
			(0.4808)	(0.4353)	(0.4738)
ROE					0.7938
					(1.0476)
DE_ Ratio					0.0068
					(0.0076)
Intercept	−1.3887	1.0122***	0.2307	−1.9789*	−1.7866
	(1.0161)	(0.2663)	(0.1387)	(1.0138)	(1.1618)
NOB	75	75	75	75	75
R2	0.049	0.033	0.046	0.106	0.146

Significance at 1%,5% and 10% level are denoted by "***" "**" and "*".
The figures in parentheses are heteroskedasticity-robust standard errors.

Appendix Table1 Basic Statistics

Panel A: All banks

Variable	Obs	Mean	Std. Dev.	Min	Max
Size	83	15.024	1.049	13.323	18.779
PS_Share	83	0.295	0.048	0.108	0.379
P_Loans	83	0.288	0.076	0.119	0.689
ROE	83	0.071	0.093	−0.421	0.259
DE_ Ratio	83	21.334	8.258	9.834	67.673

Panel B: Regional banks

Variable	Obs	Mean	Std. Dev.	Min	Max
Size	75	14.779	0.658	13.323	16.185
PS_Share	75	0.300	0.047	0.108	0.379
P_Loans	75	0.291	0.074	0.148	0.689
ROE	75	0.072	0.073	−0.264	0.193
DE_ Ratio	75	20.644	6.204	12.493	42.903

Appendix Table2 Correlation matrix of the main variable

Panel A: All banks

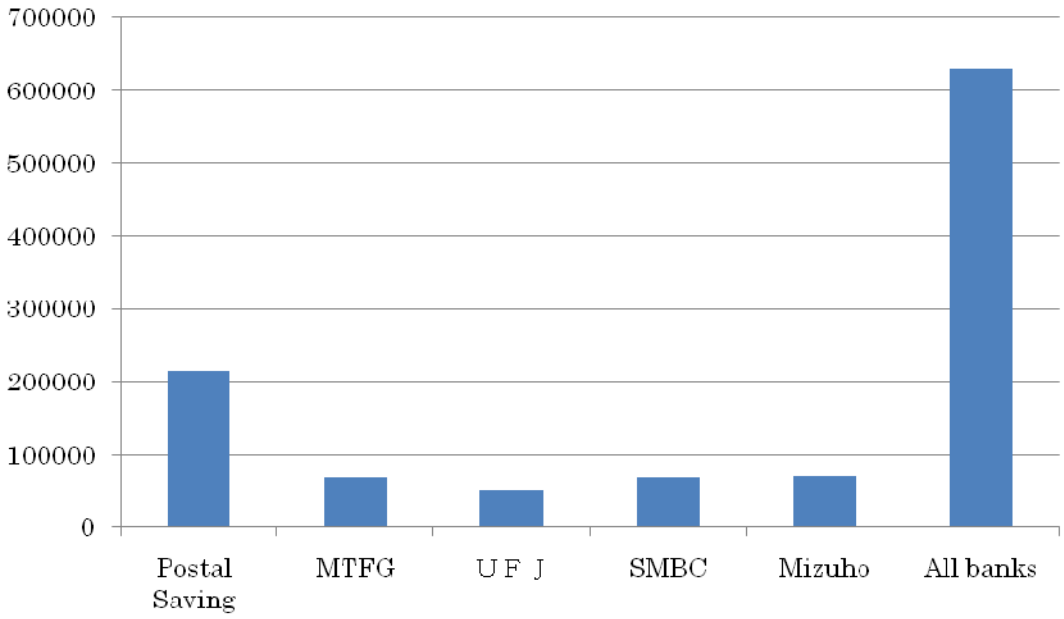
	Size	PS_share	P_Loans	ROE	DE_ Ratio
Size	1				
PS_Share	−0.2555**	1			
P_Loans	−0.0575	−0.1599	1		
ROE	−0.0393	−0.1665	0.1142	1	
DE_ Ratio	0.2069*	−0.0902	0.202*	−0.4884***	1

Panel B: Regional banks

	Size	PS_share	P_Loans	ROE	DE_ Ratio
Size	1				
PS_share	−0.0198	1			
P_Loans	−0.1057	−0.2264*	1		
ROE	0.1686	−0.2576**	0.2065*	1	
DE_ Ratio	−0.3027***	−0.004	0.2034*	−0.2176*	1

Significance at 1%,5% and 10% level are denoted by "***" "**" and "*".

Figure1. Amount of Deposits at the end of FY 2004



Source: Financial and economic statistics monthly (Bank of Japan), Nikkei NEEDS-Financial Quest and Japan Post's website(http://www.japanpost.jp/toukei/)

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