# SECTION 3
# CORPORATE
# GOVERNANCE IN JAPAN

# MERGERS DECISION IN JAPANESE SMALL MUTUAL BANKS: EFFICIENCY IMPROVEMENT OR EMPIRE BUILDINGS?[#]

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## Abstract

With the number of bank consolidations increasing around the world since the 1990s, several studies have examined what factors drive banks to consolidate, and some argue that bank managers who have a motive of empire buildings choose mergers. In this study, we deal with mergers among Japanese small mutual banks (credit associations or Shinkin banks) during the period 1996 to 2005. Japanese credit associations have been experiencing an unprecedented wave of consolidation, with their number decreasing from 410 (March 1996) to 292 (April 2006). Interestingly, unlike stock companies, mutual companies are often expected to be weak in terms of disciplining managers. If so, mutual banks tend to choose inefficient mergers at the expense of other stakeholders. Here, we use the stochastic frontier approach (SFA) to obtain "cost efficiency" proxy. We find that while the efficiency of acquiring credit associations decreases during the merger period, mergers do ultimately improve efficiency. Based on our results we find that raising efficiency, not for building empires, is an important goal for such credit association mergers.

**Keywords:** Corporate Governance, Efficiency, Mergers, Japanese credit associations

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## 1. Introduction

The financial services industry has been subject to consolidation around the world since the 1990s, and Japan has been no exception to these developments with megabank groups in particular having been established through mergers and acquisitions among city banks. Japan's 13 city banks of the early 1990s were gradually reduced to the present four city bank groups. In addition to these megabank mergers, the number of small and medium financial institutions such as credit associations (Shinkin banks) has also been decreasing through a rise in mergers and acquisitions in recent years (from 410 (March 1996) to 292 (April 2006)).

The underlying motivation for mergers of credit associations may be different from that of banks, however, given that credit associations are "mutual" organizations (Davis, 2001). More precisely, irrespective of the size of the individual member's deposits and loans, "one member, one vote" remains the basic principle guiding these institutions' actions. Furthermore, the fundamental objective of credit associations is maximization of members' benefits rather than institutional profits. Despite this, however, the managerial environment of Japanese financial institutions—including credit associations—has changed considerably in recent years. Credit associations have traditionally been classified as cooperative regional financial institutions serving small- and medium-sized enterprises (SMEs) and local residents, which were underserved by private stock banks. As large firms turn to the financial markets in recent years, banks are increasingly focusing on SMEs and the retail market. This has led to increasingly severe competitive pressure on credit associations to the extent that while mutuality remains a basic principle of such associations, the revenue structure of cooperative financial institutions has deteriorated. The recent increase in consolidation of credit associations might be a response to such environmental changes. If so, it is likely that seeking an improvement in efficiency is the main purpose behind this recent wave of consolidations among Japanese credit associations.

Studies that examine the causes and consequences of consolidation in the U.S. banking industry often highlight improvements in profit efficiency and risk diversification, although improvements in cost efficiency are harder to find (Berger *et al.*, 1999). In contrast to these findings, and while the evidence remains limited, studies dealing with "mutual" financial institutions obtain quite different results. A study of U.K. building societies found significant efficiency gains following acquisitions (Haynes and Thompson, 1999). A U.S. study of credit unions similarly found that mergers resulted in improved efficiency, whereas roughly half of acquiring credit unions and roughly 20% of acquired credit unions experienced a decline in efficiency after a merger (Fried *et al.*, 1999) Similarly, another study of Australian credit unions revealed that some mergers do produce efficiency benefits (Ralston *et al.*, 2001; Worthington, 1999, 2001). In contrast, a study of Japanese credit associations found that the cost efficiency of consolidated institutions was significantly lower than that of non-consolidated institutions shortly after the merger, while the cost efficiency of consolidated institutions improves over time (Yamori and Harimaya, 2008). These suggest that it is therefore premature to conclude that mutual institutions inevitably choose value-decreasing mergers.

This paper aims to provide new evidence by focusing on the efficiency effect of mergers of Japanese credit associations during the period 1996 to 2005 [50]. Specifically, we examine why credit associations choose consolidation and whether consolidation actually improves efficiency. If any efficiency improvements were not realized, the recent unprecedented wave of consolidation have been considered to be occurred by a sacrifice of member's interests. Thus, the motivation for empire buildings seems to be a critical factor.

Our analysis proceeds in two stages. Cost efficiency scores were calculated by employing a stochastic frontier approach in the first stage, and regression analysis was then applied to investigate the efficiency effect in the second stage. The analytical method we employ in this study has been widely used in previous studies investigating efficiency gains of consolidation in the financial sector[51].

This paper is divided into six sections. Sections 2 and 3 describe the methodology and data used in this study. Section 4 outlines the efficiency scores, and Section 5 presents and interprets the estimation results. A summary and conclusions are given in Section 6.

## 2. Empirical methodology

Two main approaches have been adopted in the literature studying efficiency in the public and private sector - a parametric and non-parametric approach. In sharp contrast to the non-parametric Data

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[50] Credit associations are not marginal institutions: Their loans amounted to 63.5 trillion yen or about 12.6% of Japanese loan markets (as of March 2007).

[51] See Amel et al. (2004) for a more detailed survey of the available empirical evidence.

Envelopment Analysis (DEA) method, which does not require any statistical assumption, the Stochastic Frontier Approach (SFA) focuses on the distribution of the error term, a part of which is considered to be inefficiency. While no consensus has been reached on the best frontier approach for efficiency analysis, the SFA is consistent with production theory and is flexible[52]. In this paper, we therefore employ the parametric Stochastic Frontier Approach (SFA).

In an attempt to estimate the stochastic frontier model, we first need to assume a functional form. In this study, we employ the standard translog function in contrast to the Fouier-flexible functional form that has been employed in recent literature, which requires a large sample size to obtain accurate results and is more suitable when applied to large banks (McAllister and McManus, 1993; Mitchell and Onvural, 1996). In addition, although the mean difference in average efficiency is statistically significant, efficiency rankings are virtually identical to the results of the standard translog function (Berger and DeYoung, 1996).

We specify the frontier cost function as:

$$\ln C = \alpha_0 + \sum_{k=1}^{n} \alpha_k \ln Y_k + \sum_{l=1}^{m} \beta_l \ln P_l + \frac{1}{2} \sum_{k=1}^{n} \sum_{j=1}^{n} \alpha_{kj} \ln Y_k \ln Y_j$$
$$+ \frac{1}{2} \sum_{l=1}^{m} \sum_{h=1}^{m} \beta_{lh} \ln P_l \ln P_h + \sum_{k=1}^{n} \sum_{l=1}^{m} \delta_{lk} \ln Y_k \ln P_l + v + u \quad (1)$$

where $C$ is total costs, $Y_i$ are the outputs and $P_k$ are the input prices, $v$ is statistical noise, assumed to be distributed as a two-sided normal with zero mean and variance $\sigma^2$, $u$ is the inefficiency term, assumed to be distributed as a one-sided positive disturbance, and $\alpha$, $\beta$, and $\delta$ are coefficients to be estimated. The SFA requires *a priori* distributional assumptions regarding the inefficiency term, $u$. Following previous studies (Mester, 1996; Allen and Rai, 1996, Altunbas *et al.*, 2000), we specify the distribution to be half-normal. Furthermore, the usual symmetry and linear homogeneity restrictions are imposed *a priori*.

Estimates of this model can be carried out through the maximum likelihood procedure[53]. As Jondrow *et al.* (1982) pointed out, observation-specific estimates of inefficiency are obtained as the mean of the conditional distribution (i.e., $E[u_i|\varepsilon_i]$ ($\varepsilon_i = v_i + u_i$)). In this study, we employ the alternative point estimator proposed by Battese and Coelli (1988), which can be expressed as follows:

$$CE_i = E(\exp\{-u_i\} \mid \varepsilon_i) = [\frac{1 - \Phi(\sigma_* - \mu_{*i}/\sigma_*)}{1 - \Phi(-\mu_{*i}/\sigma_*)}] \cdot \exp\{-\mu_{*i} + \frac{1}{2}\sigma_*^2\} \quad (2)$$

where $\mu_{*i} = \varepsilon_i \sigma_u^2/\sigma^2$ and $\sigma_* = \sigma_u \sigma_v/\sigma$ ($\sigma^2 = \sigma_u^2 + \sigma_v^2$). The efficiency scores obtained from (2) have a value of between 0 and 1.

After obtaining a "cost efficiency" measurement, we then employ a multinomial logit regression to investigate whether the efficiency could be considered as a determinant of merger activity. We identify an acquiring credit association as a legally surviving institution and an acquired credit association as an institution that has legally disappeared. Accordingly, the dependent variable of the multinomial logit model is divided into the following three groups: Taking value zero if a credit association was not involved in a merger; value one if a credit association acquired another credit association (acquiring); and value two if a credit association was acquired by another credit association (acquired). In addition to the pre-merger investigations, we also empirically examine the post-merger efficiency gains. To avoid a shortage of degree of freedom, we pool our data from the period 1996 to 2005. Table 1 shows fluctuations in numbers of each group for the sample period. As shown in Table 1, there are 410 credit associations for the sample from 1996, while recent consolidation reduced the sample size to 292 credit associations by 2005[54].

## 3. Data

With regard to the input and output specification, we employ the intermediation approach commonly used in the literature on modeling bank behavior (e.g., Sealey and Lindley, 1977). We define three inputs and outputs, so that credit associations are viewed as financial intermediaries that use labor, capital, and funds as inputs and produce loans and securities services as outputs. Here, we use interest income on loans and discounts ($Y_1$), other interest income ($Y_2$), and fees and commissions ($Y_3$) as output variables. Three input prices are defined as follows: The labor price ($P_1$) is the ratio of personnel expenses to the number of employees, the price of capital ($P_2$) is the ratio of non-personnel expenses to the value of movable and immovable capital, and the price of funds ($P_3$) is the ratio of interest expense on deposits to the total amount of deposits. Total costs are defined as a sum of labor expenses, interest expenses, and capital expenses. All the data used in this study are taken from *The Analysis of Financial Statement of All*

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[52] Although several studies attempt to compare analytical techniques, the results differ with regard to efficiency scores and rank correlations (Berger and Mester, 1997; Bauer *et al.*1998; Weill 2004).

[53] See Kumbhakar and Lovell (2000) for more details.

[54] In this paper, all years are expressed in fiscal years. For example, the Japanese fiscal year 1999 runs from April 1, 1999 to March 31, 2000.

*Credit Associations* for the period 1996 to 2005. Table 2 provides descriptive statistics of the relevant variables for fiscal 1996 and 2005.

For the second stage multinomial logit regression, we chose financial health, market power, and profitability in addition to the cost efficiency discussed above as important independent variables. For the financial health variables, we use the capital ratio (*CPR*), which is defined as the ratio of total capital to total assets[55]. We expect that acquired credit associations are financially unhealthy and acquiring credit associations are financially healthy.

We use the share of loans of associations within each prefectural market (*LMS*) for the market power proxy. If size is an important factor in credit association mergers, a positive coefficient is expected in terms of regression in acquiring credit associations and a negative coefficient for acquired credit associations. For profitability variables, we use the following two variables: The loan-to-deposit ratio (*LDR*) and the general and administrative expenses ratio (*GAER*). The first measure (*LDR*) relates to differences in demand for loans, quality of borrower, and management skill in lending. A positive (negative) coefficient is thought to exist *ex-ante* for acquiring (acquired) credit associations. The second measure (*GAER*) is defined as the ratio of administrative expenses to total income. That is, it captures the possibility that an association's operating costs exceed its revenues. We expect that acquiring (acquired) credit associations have lower (higher) *GAER*. Moreover, for the variable reflecting mutual financial characteristics of credit associations, we have included the degree of dependence on interest on deposits with banks (*DDID*), which expresses dependency on the Shinkin Central Bank, which serves as the central bank for credit associations[56]. If a credit association with profitable loan opportunities does not make deposits to the Shinkin Central Bank, a higher *DDID* suggests lower profitability. We therefore expect that acquired (acquiring) credit associations are likely to have a higher (lower) *DDID*. Finally, as control variables, we use the logarithm of the number of cooperative members (*LCM*), and dummy variable (*DDM*), which takes one for the deficit credit association and zero otherwise.

## 4. Summary of cost efficiency scores

Due to space limitations, we do not include details of the parameters of the frontier cost function in this study[57]. The majority of the parameters, including those of dummy variables, are approximately estimated. The regularity conditions of the cost function evaluated for the mean values are also satisfied. Furthermore, results of the LR test for the presence of a stochastic element of inefficiency reject the null hypothesis of no inefficiency at the 1% significance level.

Table 3 shows the time-varying average cost efficiency scores. In addition to the results of pre-merger credit associations, the table also displays those of the just-merged credit associations in each year. Results from the full sample indicate that cost efficiency scores vary only very slightly around the 90% mark. With regard to a comparison between pre- and post-merger values, average cost efficiency is generally higher in pre-merger credit associations, whereas that for post-merger credit associations is usually lower. The latter results are highly consistent with the findings of Yamori and Harimaya (2008) that institutions subject to merger experience significant declines in their DEA efficiency scores in the year of amalgamation. In contrast, however, the yearly average measures of acquiring credit associations are more efficient than those of acquired credit associations in 7 out of 10 years, while these differences between average efficiencies are statistically insignificant[58].

## 5. Empirical results of credit association mergers

The estimated coefficients for the multinomial logit regressions are presented in Table 4. In these regressions, credit associations that have not been subject to any consolidation are provided as a reference group. We initially pay attention to the coefficient of the cost efficiency (*CE*), which is considered an important determinant of credit association consolidation. In an attempt to verify the consistency of the results, we also estimate a reduced model formed by omitting the *CE* variable. As shown in the results of the full model, our findings reveal that the estimated coefficient of the cost efficiency (*CE*) is significant with the hypothesized sign only for acquiring credit associations. It should

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[55] As credit associations were not obligated to disclose the amount of non-performing loans until recently, we were unable to take the bad loan ratio into account.

[56] The main role of the Shinkin Central Bank lies in the effective investment of the credit associations' surplus funds, adjusting supply and demand for funds among the credit associations, and functioning as a clearing bank for credit associations.

[57] Estimation results are available from the authors upon request. While not shown in (1), annual dummy variables (reference year: 1996) are employed.

[58] A study of Australian credit unions found that acquired credit unions are less efficient than acquiring credit unions (Worthington, 2004). A study of U.S. credit unions, in contrast, found the exact opposite result (Fried *et al.*, 1999).

therefore be noted that more cost efficient credit associations are more likely to acquire other credit associations. This suggests that credit associations under good management tend to improve the efficiency of their acquired institutions by using their inherent management skills. Expected efficiency-gains can therefore be seen as an important motive behind credit association mergers; thus, empire buildings motives are not revealed. These results are consistent with the findings of a study of Australian credit union mergers (Worthington, 2004).

Turning to the other results regarding the full model, in the case of the probability of acquiring credit associations, the coefficients relating to the loan-to-deposit ratio (*LDR*), the general and administrative expenses ratio (*GAER*), and the number of cooperative members (*LCM*) are significant with positive signs. The fact that the capital ratio (*CPR*) and the share of loans within each prefectural market (*LMS*) are insignificant, however, indicate that both financial health and market power are not relevant determinants for credit associations in deciding whether to acquire other institutions. We observed an interesting result in terms of the coefficient of the *GAER* variable; its sign is opposite to the *ex-ante* prediction. The results for the *LCM* variable indicate that larger credit associations are more likely to acquire other credit associations.

In looking at acquired credit associations, we find that the estimated coefficients are significant for all factors but the *LDR* variable. In particular, and in sharp contrast to the results from acquiring credit associations, the variables for financial health and market power conform to the hypothesized sign. These results suggest that credit associations in a relatively weak financial condition and with a small market share are more likely to be acquired compared to a credit association that does not involve consolidation. Furthermore, the positive coefficient of the *GAER* is identical to the results provided by acquiring credit associations. We found it noteworthy that the coefficient of the degree of dependence on the Shinkin Central Bank (*DDID*) is negative - its sign is also the reverse of the *ex-ante* prediction. The results for the *LCM* and the *DDM* variables are consistent with our general expectations - the smaller and less profitable the credit association, the more likely it is to be acquired.

Finally but equally importantly, we investigate the post-merger performance of the acquiring credit associations. In order to examine the post-merger efficiency improvement, we use a simple OLS regression analysis method with cost efficiency scores as the dependent variable and the time dummy variables indicating the years after the merger as independent variables. As part of the regression analysis we also use the cost efficiency rank as the dependent variable on the basis that the efficiency scores obtained from SFA are not statistically consistent. By using the cost efficiency scores for each year, the ranks are converted to a uniform scale over the [0, 1] interval using the formula $(order_{it}-1)/(n_t-1)$, where $order_{it}$ is the order rank of the $i^{th}$ credit association in the $t^{th}$ year evaluated from the cost efficiency scores, and $n_t$ is the number of credit associations in year t. The credit association with the lowest cost efficiency score therefore has the worst rank of 0, and the credit association with the highest cost efficiency score has the best rank of 1 in each year.

Results of the regression analysis are presented in Table 5. As the table shows, we consider a set of dummy variables for years t, t+1, t+2, t+3 and t+4 – namely, from the year of merger to four years after the merger. Despite the low explanatory power and insignificant estimates, some interesting results can clearly be observed.

First, in terms of the results of cost efficiency scores, the estimated coefficients are clearly negative in the period t to t+2 but positive in the periods t+3 and t+4. This indicates that mergers experience efficiency declines over periods of up to two years following a merger, and become relatively efficient as time passes. The former findings are in contrast to the findings of Fried *et al.* (1999) regarding U.S. credit unions. Such differences may be caused by different adjustment speeds between Japan and the U.S. It generally takes longer to rebuild and reallocate management resources such as branch offices and employees in Japan than in the U.S. Indeed, it is extremely rare to observe any substantial reduction in management resources following mergers between Japanese financial institutions, so it should be noted that efficiencies are temporarily reduced due to the small cost reduction at the initial stage of the merger process[59]. However, as shown in the coefficients on the year dummy variables for t+3 and t+4, we find that there is a tendency for such institutions to increase in efficiency over time. Although it may take several years to realize the benefits of mergers, these results are consistent with our previous findings that most Japanese credit associations chose mergers to enhance their efficiency. The results of cost efficiency ranks also present the same findings - the efficiency effect of credit association mergers is apparent several years later.

In sum, although mutual companies are said to be weak in corporate governance, managers in Japanese

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[59] Some U.S. banking studies also found that acquirers failed to improve efficiency after the merger (Rhoades, 1993; DeYoung, 1997; Peristiani, 1997; Berger, 1998).

mutual banks are actually well disciplined. One of reasons is that recent severer market competition in Japan does not allow managers to choose inefficient mergers. Another interesting finding is that Japanese mutual bank managers can implement mergers from the long-term perspective. If stakeholders has short-term horizon, they may make an objection of managers' merger decisions, which erode short-term profitability. We need further research on whether stakeholders have similar long-horizon or managers have strong discretion power.

## 6. Concluding remarks

In this present study we set out to investigate the underlying motives of mergers by Japanese credit associations during the period 1996-2005 and also consider the consequences of these mergers. Our findings can be summarized as follows.

First, the cost efficiency obtained from SFA is an important factor on mergers between credit associations, and cost efficient credit associations tend to be acquirers of other associations. Second, the cost efficiency of acquiring credit associations declines over a period of up to two years following a merger, and become relatively efficient as time passes.

These results suggest that efficiency improvement is one of the important motives for credit associations in undertaking mergers. In other words, as sound corporate governance in mutual institutions in Japan is confirmed, our results supports that empire building of bank managers is limited regarding Japanese small banks. Also, we find that it may take several years to achieve an improvement in efficiency. This means that Japanese mutual banks managers are allowed to have a long-term perspective, while managers in stock companies are under strong pressure of short-term profits maximization. We need further research on these interesting facts.

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**Appendices**
**Table 1.**

Database Sample Size of Credit Association Merger Study, 1996-2005

| Year | Total | Pre-merger | |
| --- | --- | --- | --- |
| | | Acquiring | Acquired |
| 1996 | 410 | 8 | 9 |
| 1997 | 401 | 3 | 5 |
| 1998 | 395 | 5 | 9 |
| 1999 | 386 | 7 | 7 |
| 2000 | 370 | 11 | 16 |
| 2001 | 343 | 14 | 17 |
| 2002 | 326 | 14 | 20 |
| 2003 | 306 | 7 | 7 |
| 2004 | 298 | 5 | 6 |
| 2005 | 292 | 3 | 5 |

**Table 2**

Descriptive Statistics of Relevant Variables used for DEA to Measure Efficiency (millions of yen)

| Variable | | 1996 | | 2005 | |
| --- | --- | --- | --- | --- | --- |
| | | Mean | Std. dev. | Mean | Std. dev. |
| $Y_1$ | Interest income on loans and discounts | 5,901 | 7,429 | 5,300 | 6,764 |
| $Y_2$ | Other interest income | 2,209 | 3,223 | 1,653 | 1,971 |
| $Y_3$ | Fees and commissions | 420 | 527 | 755 | 976 |
| $P_1$ | Labor price | 6.6384 | 0.7731 | 0.0006 | 0.0004 |
| $P_2$ | Physical capital price | 0.4514 | 0.1596 | 7.1657 | 0.8996 |
| $P_3$ | Deposit interest price | 0.0067 | 0.0010 | 0.3756 | 0.1492 |
| $C$ | Total costs | 5,944 | 7,793 | 5,105 | 6,064 |
| | Number of observations | 410 | | 292 | |

**Table 3**

Time-Varying Average Cost Efficiency

| Year | Total | Pre-merger | | Merged |
| --- | --- | --- | --- | --- |
| | | Acquiring | Acquired | |
| 1996 | 0.9002 | 0.9087 | 0.9233 | 0.8010 |
| 1997 | 0.9000 | 0.9075 | 0.8959 | 0.7724 |
| 1998 | 0.8997 | 0.9089 | 0.8625 | 0.7970 |
| 1999 | 0.8977 | 0.9116 | 0.8824 | 0.7195 |
| 2000 | 0.8976 | 0.9216 | 0.8953 | 0.8612 |
| 2001 | 0.8961 | 0.9035 | 0.8991 | 0.7952 |
| 2002 | 0.8942 | 0.9034 | 0.8893 | 0.7679 |
| 2003 | 0.8931 | 0.9065 | 0.9097 | 0.7661 |
| 2004 | 0.8957 | 0.9119 | 0.9099 | 0.7603 |
| 2005 | 0.8963 | 0.8792 | 0.8989 | 0.8455 |

**Table 4**

Multinomial Logit Regressions Results

| | Full model | | | | | | Reduced model | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Acquiring | | | Acquired | | | Acquiring | | | Acquired | | |
| Variable | Coefficient | | Std. error | Coefficient | | Std. error | Coefficient | | Std. error | Coefficient | | Std. error |
| CONS. | -20.8832 | *** | 3.9666 | 3.3187 | | 2.9585 | -14.0595 | *** | 2.4811 | 5.9807 | *** | 1.8842 |
| CE | 7.0100 | ** | 3.1674 | 2.8163 | | 2.4230 | | | | | | |
| CPR | -0.7819 | | 6.0270 | -21.2692 | *** | 4.2955 | 2.3410 | | 6.1480 | -20.0980 | *** | 4.2057 |
| LMS | -0.0436 | | 0.0454 | -0.7764 | *** | 0.1745 | -0.0494 | | 0.0465 | -0.7829 | *** | 0.1738 |
| LDR | 2.7897 | ** | 1.3494 | -0.7058 | | 1.0270 | 3.2217 | ** | 1.3258 | -0.4102 | | 0.9872 |
| GAER | 3.3379 | ** | 1.5394 | 2.4135 | * | 1.2523 | 2.2704 | | 1.4644 | 1.9429 | | 1.1871 |
| DDID | -5.5851 | | 5.6530 | -18.9671 | *** | 6.1745 | -7.2935 | | 5.6718 | -19.8826 | *** | 6.1218 |
| LCM | 0.7341 | *** | 0.1553 | -0.8893 | *** | 0.1702 | 0.7095 | *** | 0.1565 | -0.8955 | *** | 0.1692 |
| DDM | -0.3563 | | 0.4179 | 1.2686 | *** | 0.2398 | -0.3493 | | 0.4160 | 1.2837 | *** | 0.2387 |

**Table 5**

OLS Regressions
Results

| Variable | Coefficient | | Std. error | Coefficient | | Std. error | Coefficient | | Std. error | Coefficient | | Std. error |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Const. | 0.8989 | *** | 0.0030 | 0.8974 | *** | 0.0031 | 0.5145 | *** | 0.0176 | 0.5045 | *** | 0.0182 |
| $Year_t$ | -0.0533 | | 0.0510 | -0.0518 | | 0.0510 | -0.1104 | | 0.1679 | -0.1004 | | 0.1680 |
| $Year_{t+1}$ | -0.0045 | | 0.0203 | -0.0030 | | 0.0204 | -0.0383 | | 0.1405 | -0.0283 | | 0.1405 |
| $Year_{t+2}$ | -0.0330 | *** | 0.0096 | -0.0315 | *** | 0.0097 | -0.2445 | *** | 0.0537 | -0.2345 | *** | 0.0539 |
| $Year_{t+3}$ | | | | 0.0137 | | 0.0134 | | | | 0.1008 | | 0.0890 |
| $Year_{t+4}$ | | | | 0.0270 | ** | 0.0107 | | | | 0.1690 | ** | 0.0860 |
| Adj. $R^2$ | 0.0280 | | | 0.0320 | | | 0.0245 | | | 0.0316 | | |

\*\* Significance level at the 5% l
\*\*\* Significance level at
the 1% level.