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# The Dynamic Impacts of M&A on Employment in Japan
## — Using Micro-data from the Financial Statements Statistics of Corporations by Industry —

Hiroyuki Taguchi
Vice President
Policy Research Institute, Ministry of Finance

Taichi Yanagawa
Researcher
Policy Research Institute, Ministry of Finance

Masashi Harita
Economist
Policy Research Institute, Ministry of Finance

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Research Department, Policy Research Institute, MOF
3-1-1 Kasumigaseki, Chiyoda-ku, Tokyo 100-8940, Japan
TEL 03-3581-4111

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Hiroyuki Taguchi, Taichi Yanagawa, and Masashi Harita
Policy Research Institute, Ministry of Finance

***Abstract***

*This paper provides empirical evidence on the effects of mergers and acquisitions (M&A) on employment in Japan. It contributes to the literature by capturing dynamic employment impacts of various types of M&A using the latest micro data of firms' financial statements. Our main findings are: the dynamic effect of "firm acquisitions" on a target firm's employment proved to be significantly positive mainly in the manufacturing sector, while the dynamic effect of "mergers" on a remaining firm's employment turned out to be significantly negative mainly in the non-manufacturing sector. The switching pattern from negative impact to positive impact on a target firm's employment in the dynamic post-acquisition process appeared more clearly in the domestic acquisition case than in the cross-border acquisition case for the manufacturing sector. We speculate that the dynamic positive employment effect of firm acquisitions reflects the efficiency' gains by a firm's management improvements in the post-acquisition process, whereas the dynamic negative employment effect of mergers implies organizational rationalization in the post-merger process.*

*Key words: M&A, firm acquisitions, mergers, dynamic employment effects*
*JEL Classification Codes: D21, M51*

## 1. Introduction

There has been a boom in recent decades at a global level of mergers and acquisitions (M&A) in firms' activities, under the background of the progress of technological innovation and deregulation. Japan has been not an exception to this boom, and experienced a rapid increase in its M&A activities since the later half of the 1990s. Although the global credit shrinkage caused by US subprime loan turmoil and the subsequent deterioration of the real economy impacted on global M&A trends, Japanese M&A activities have still held at a high level.

The impact of M&A on the value of both the acquiring and the acquired firm has been the subject of a large and growing body of research literature. As for the effects on labor, there is a popular perception that acquisition activity usually leads to, and indeed is often motivated by, the opportunity for substantial workforce reduction. This general interpretation was typically endorsed by the influential contribution of Shleifer and Summers (1988), which suggested that the control changes associated with acquisition activity offer an opportunity to firms to renege on implicit and explicit labor contracts, leading to a "breach of trust" with employees. On the other hand, acquisitions may occur because the firm believes it can manage the firm more efficiently than current management. Better management might lead to more and better jobs, particularly if the new management has better access to capital markets for expanding the operation. While there exists an abundance of anecdotal and general comments on the topic, there is very little systematic empirical evidence on the employment effects of M&A, and almost none in Japan. Furthermore, the limited existing literature– see Section 2 below– shows a variety of sampling procedures and methodologies, and is also ambiguous in its findings.

This paper provides a systematic empirical analysis of the effects of M&A on employment in Japan. It contributes to the Japanese literature by capturing dynamic employment impacts of various types of M&A using the latest micro data of firms' financial statements. The paper proceeds as follows. Section 2 describes the recent trends in M&A in Japan; Section 3 summarizes the empirical literature and makes clear our contribution; Section 4 represents the empirical framework and estimation results; and the last section offers our conclusions.

## 2. Recent Trends in M&A in Japan

Japan has experienced a so-called M&A boom since the later half of the 1990s.

Figure 1 indicates the remarkable increase in the number of M&A cases, from around 500 cases in the mid 1990s to around 2,000 cases in the 2000s, although showing a decline after 2007 due to the global credit shrinkage (see Figure 1).

Looking at their composition by the type of M&A in Table 1, we can find the following characteristics. First, the number of M&A cases in which a Japanese firm acquired a foreign firm (an "in-out" M&A) has shown rapid growth in the latter half of 1980s and a rather stable trend thereafter. The share of "in-out" M&A also climbs to about 60 percent until 1990, and then continues to decline toward around 15 percent in 2008. The background of the "in-out" M&A boom in the 1980s is nothing more than the robust economy in that period, which made Japanese companies go ahead into foreign markets, with the Sony Corporation's acquisitions of CBS Records Inc. and Columbia Pictures Entertainment a typical example.

Second, the main element in creating the 1990s-2000s M&A boom was "in-in" M&A cases, in which a Japanese company acquired another Japanese one. Its number as well as its share has gone up from around 200-300 cases (the share: around 50 percent) in the mid 1990s toward more than 2,000 cases (the share: about 80 percent) in the mid 2000s. The "in-in" M&A boom appears to have come mostly from the necessity for industry consolidation amid intensifying international competition. In the steel industry, for example, two of Japan's major steelmakers – Kawasaki Steel Corp. and NKK Corp. – were merged into JFE Holdings, inc. in 2002, in response to fierce competition with their South Korean and Chinese counterparts. The individual companies' efforts to reorganize group companies with the introduction of new accounting rules on a group-wide basis, may have contributed to the "in-in" M&A boom.

Lastly, another element for the 1990s-2000s M&A boom was "out-in" M&A cases, in which a Japanese company was acquired by a foreign one. The number increased from around 50-60 cases in the mid 1990s toward about 200 cases in the mid 2000s. "Out-in" M&A can often be seen as a case for strengthening the domestic presence of foreign companies, with the Citigroup's acquisition of the Nikko Cordial group in 2007 a typical example. The activated role of foreign investment funds seems to have contributed to the increase in "out-in" M&A.

In investigating the factors behind the 1990s-2000s M&A boom, Arikawa and Miyajima (2007) picked up two different hypotheses and examined which hypothesis was applicable to the Japanese M&A boom. The first hypothesis, which is often referred to as a neoclassical explanation, focuses on industry-level shocks to growth opportunities and profitability as a factor of M&A. Mitchell and Mulherin (1996), and Harford (2005), recognizing that M&A activities concentrate on specific industries,

argued that the occurrence of shocks to growth opportunities and/or profitability that require a large-scale intra- or inter-industry redistribution of resources leads to a boost in the number of M&A as an efficient means of reallocating resources. The other hypothesis is called "market-driven," based on the assumption of stock market mispricing. Shleifer and Vishny (2003) theoretically showed that managers of bidding companies, when they have information that the market valuation of their companies is higher than their fundamental value, have an incentive to seek profits by making acquisitions in stock-for-stock deals, and that myopic managers of target companies have an incentive to sell their companies, in disregard of the long-term profit prospects, by agreeing to favorable terms offered by bidders.

Arikawa and Miyajima (2007) examined the hypotheses above by using industry-by-industry data as well as individual companies' data. Their findings supported not the "market-driven" hypothesis but the neoclassical explanation: that the 1990s-2000s M&A boom in Japan came from some sort of shock that impacted on the growth opportunities and profitability of industry.[1] Miyajima et al. (2007) also stated that the recent, rapid increase in M&A in Japan has been driven by economic shocks - both positive and negative - such as technological innovation and sharp falls in demand, and that the increase in M&A have facilitated resource allocation in terms of downsizing less profitable divisions and expanding high-growth divisions, thereby contributing to the improvement of organizational efficiency through the transfer of management resources and know-how. These findings, that the M&A in Japan has been driven by real shocks, lead us to recognize the significance in examining the labor impact of the M&A in the latter section of this paper.

## 3. Previous Studies and Our contribution

Evidence on the overall employment impact of M&A has been very limited. In addition, the limited evidence has been based on a variety of sampling procedures and methodologies, and has reported mixed findings. We first present theoretical considerations, and then pick up several representative studies on the United States of America (USA), European countries including the United Kingdom (UK), and Japan.

It seems to be difficult to extract strong predictions about the employment consequences of M&A activities from the extensive literature of theories about M&A.

[1] As well as testing the two hypotheses, they described the impact of legal reform on promoting M&A: the lifting of the ban on holding companies (1997), the introduction of stock transfer system (1999), tax incentive measures for revitalizing industry (1999), etc.

This is because the employment outcomes may differ depending on the motive type of the M&A. Mueller (2003), for instance, picked up the following as important motives for M&A: 1) obtaining genuine synergy gains, 2) utilizing economies of scale in various forms, 3) strengthening the market power in pricing, 4) revising implicit agreements related to the firm's personnel and other stakeholders, and 5) promoting the manager's own deviating interests. Of these, a synergy-promoting M&A may create employment by improving productivity and expanding market share, whereas the new management team which reneges on implicit labor contracts may provably reduce the amount of workforce. The difference in the types of the M&A, such as horizontal or vertical cases, and related or unrelated cases, may also influence the employment effects (e.g. Dutz, 1989). All in all, the theory does not seem to give a clear prediction about the employment effects of the M&A. The net employment effect is, thus, nothing more than an empirical matter.

As for the empirics in the USA, Brown and Medoff (1988) examined the effects of firm's control changes with a large sample of firms in the state of Michigan. Their results suggested that the employment consequences depend upon the type of control change: asset disposals were followed by a decrease in employment, while true mergers produced a small increase. The generality of the results is open to question, because their data set was numerically dominated by very small firms and excluded interstate acquisitions, where large-scale takeovers predominated. McGuckin et al. (1995), in a study using US plant-level data, reported that employment in acquired plants increased relative to that in non-acquiring firms, but suggested this was accompanied by improved operating efficiency, particularly in the smaller plants in their sample. However, when the authors used firm-level data they found no significant employment consequences. In a more recent study, McGuckin and Nguyen (2001) argued that ownership changes are not a primary vehicle for cuts in employment and wages, or closing plants, and instead, ownership changes are associated with increases in employment for the entire US manufacturing sector.

Concerning the literature in European countries, Conyon et al. (2002) provided a systematic empirical analysis of the effects of take-over and merger activity on firm employment in the UK using a specially constructed database. They indicated that significant rationalizations in the use of labor occur as firms reduce joint output and increase efficiency in post-merger process, and that these effects are particularly pronounced in the case of related and especially hostile mergers. On the other hand, Amess and Wright (2007), using a unique hand-collected dataset, examined the effects of leveraged buyouts on wages and employment in the UK. They found that all

leveraged buyouts taken together have an insignificant effect on employment growth but have significantly lower wage growth than non leveraged buyouts. Lehto and Böckerman (2008) examined the employment effects of M&A by using establishment-level data from Finland, and found that the cross-border M&A leads to downsizing in manufacturing employment as well as the changes in ownership associated with domestic M&A also causing employment losses.

As long as we see the previous works above, the evidence of labor losses by M&A appear more often in European countries than in the USA. Here comes Gugler and Yurtoglu (2004), which compared the effect of mergers and acquisitions on employment in Europe and the USA. While they did not find adverse effects of mergers on labor demand in the USA, they did find negative effects in Europe of the order of minus 10% compared to pre-merger levels. They attributed this significant difference to more rigid labor markets in Europe than in the USA.

Evidence on the employment impact of mergers and acquisitions has been extremely limited in Japanese literature. To our knowledge, the only systematic empirical study is found in Kubo and Saito (2007). They focused their analysis on the impact of mergers on employment, and examined 114 cases of mergers during the period from 1990 to 2003 among companies whose stock is listed on the Stock Exchange Market. They found that during the post-1999 period, mergers brought about an effect on employees' reduction by ten percent on average, and that the effect varied depending on the purpose of the mergers as well as pre-merger firm's performance: mergers within related industries and mergers intended for firm relief produced more curtailment of employees than the average.

This paper tries to extend the afore-mentioned research literature, and mainly the work of Kubo and Saito (2007), in the following directions. First, we target various types of M&A, i.e. firm acquisitions, capital participation, capital increase, and merges, in examining the employment impacts whereas Kubo and Saito (2007) concentrate only on the effect of *mergers* on employment. This enables us to compare the employment impacts among the types of the M&A. Second, our observation covers not only the firms listed in the Stock Exchange Market but also unlisted firms by using the specific micro data, while Kubo and Saito's (2007) estimation covers only listed firm. Thus, our estimation includes the behavior of medium-size companies. Thirdly, and more importantly, our estimation captures the *dynamic* employment effects of M&A as well as the *immediate* effects, while most earlier studies, including Kubo and Saito (2007), estimated only the *immediate* effects. It seems to take some years for M&A activities to finalize a company's resource allocation in terms of downsizing less profitable sections

and expanding high-growth sections, or in terms of rationalizing the backward offices as a whole. It is thus indispensable to count on dynamic aspects in examining the employment effects of M&A.

## 4. Empirical Studies

We now turn to empirical studies of the effects of M&A on firms' employment in Japan. Before launching into the analysis, we first clarify the methodology and data used, and then exhibit the estimation results and their interpretations.

### 4.1 Methodology

An ordinary dynamic labor demand function, assuming that output-constrained firms face continuous quadratic adjustment costs and use a Cobb–Douglas technology, takes the following form of equation. Nickell (1984) and Bresson et al. (1996) derived the equation, and such subsequent studies as Conyon et al. (2002), Gugler and Yurtoglu (2004), and Kubo and Saito (2007), have employed the equation for estimating the effect of M&A on employment:

$$E_{it} = \alpha E_{it-1} + \beta_1 Q_{it} + \beta_2 Q_{it-1} + \gamma_1 W_{it} + \gamma_2 W_{it-1} + \delta_1 C_{it} + \delta_2 C_{it-1} + \eta_t D_t + \theta_j ID_j + f_i + \varepsilon_{it} \quad (1)$$

where $E_{it}$, $Q_{it}$, $W_{it}$ and $C_{it}$ denote the logarithms of employment, real output, real wage, and user cost of capital regarding firm i in period t. $D$t are a set of time dummies to account for technical progress and business cycle effects, $ID_j$ is a set of industry dummies to signify the specific effect of the industry that a firm belongs to[2], and $f_i$ is firm-specific fixed effects that reflects intra-firm differences in technology and management. $\varepsilon_{it}$ is an equation disturbance term.

Our method of estimating the impact of M&A on employment is to introduce the dummy variables that signify the actions of various types of M&A carried out by a specific firm in a specific time. Our estimation does not include time dummies, since the estimation period is limited to thirteen years, and since time dummies may have multicollinearity with the M&A dummies in the sense that the M&A activities can be influenced by business cycle. It also has to be noted that, due to data constraints, our

[2] The industry classification (j = 43) follows that of the data source, the "Financial Statements Statistics of Corporations by Industry".

estimation focuses only on the employment effects of not the acquirer but the *target* firm in the cases of firm acquisitions, capital participation and capital increase, and the *remaining* firm in the case of mergers. For the purpose of capturing the *dynamic* employment effects of the M&A, we specify the equations for the baseline estimation in the following ways.

$$
\begin{aligned}
E_{it} = \text{const.} + \alpha E_{it-1} + \beta_1 Q_{it} + \beta_2 Q_{it-1} + \gamma_1 W_{it} + \gamma_2 W_{it-1} + \delta_1 C_{it} + \delta_2 C_{it-1} + \theta_j ID_j + f_i + \varepsilon_{it} \\
+ \lambda_{a0} DA_{it} + \lambda_{b0} DCP_{it} + \lambda_{c0} DCI_{it} + \lambda_{d0} DM_{it} \\
+ \lambda_{a1} DA_{it-1} + \lambda_{b1} DCP_{it-1} + \lambda_{c1} DCI_{it-1} + \lambda_{d1} DM_{it-1} \\
+ \lambda_{a2} DA_{it-2} + \lambda_{b2} DCP_{it-2} + \lambda_{c2} DCI_{it-2} + \lambda_{d2} DM_{it-2} \\
\cdots \\
+ \lambda_{a10} DA_{it-10} + \lambda_{b10} DCP_{it-10} + \lambda_{c10} DCI_{it-10} + \lambda_{d10} DM_{it-10} \qquad (2)
\end{aligned}
$$

where *DA*, *DCP*, *DCI* and *DM* are the M&A dummies: "firm acquisitions", "capital participation", "capital increase", and "mergers", respectively.[3] For instance, $DA_{it} = 1$ if the firm i is acquired by another firm in the period of t, and zero elsewhere. The key statistics of interest, $\lambda_0$, measures the *immediate* impact of the M&A on labor demand in percentage terms relative to the non-M&A labor trends, and $\lambda_1$, $\lambda_2$,$\cdots$ represent the *dynamic* impact on post-M&A employment. We examine the dynamic impact until ten years later due to data constraints. The ordinary labor demand function expects positive sign of sale's coefficient $\beta$, negative sign of wage's coefficient $\gamma$, and positive sign of the coefficient of user cost of capital $\delta$.

Our analysis further extends the baseline estimation above in the following directions. First, we examine the employment impacts of M&A by sector: the manufacturing and non-manufacturing sectors. To be specific, we divide the M&A dummies into two sectors –the dummy for firm acquisitions, *DA*, for instance, is divided into *DA*_m for the manufacturing sector and *DA*_nm for the non-manufacturing sector. Second, we investigate the differences in the employment impact between the cases of a cross-border acquisitions (in which the purchaser is a foreign company that is located abroad) called an "out-in acquisitions", and a domestic acquisition called an "in-in acquisitions", and further examine the two sector's effects in the in-in and out-in

[3] The definition of each case is as follows; "firm acquisitions" is a case where more than 50 percent of the target firm's equity is acquired by another firm; "capital increase" is a case in which acquired equity is increased but up to less than 50 percent; "capital participation" is a case where the target firm's equity is acquired newly but up to less than 50 percent; and "mergers" is a case in which the firm is merged.

classification. Since the classification causes a lack of data necessary for estimation in the specific M&A dummy case, we create the combined dummy for *DA*, *DCP*, *DCI*, as *DACPCI* (we exclude *DM* from the combination to avoid the complexity of interpretation), and divide it into *DACPCI*_in for the in-in case sector and *DA*_out for the out-in case, and further partition them into the two sectors.

Another focus of our analysis is concerned with estimation techniques. Equation (2) contains a lagged dependent variable among the explanatory variables, and thereby the Ordinary Least Squares (OLS) estimator is inconsistent. Obtaining consistent estimates requires the application of an instrumental variables estimator or Generalized Method of Moments (GMM). We herein adopt the system GMM estimator (two-step, robust) developed by Arellano and Bover (1995), and Blundell and Bond (1998), who argue that additional instruments can be obtained in a dynamic model from panel data if we utilize the orthogonality conditions between lagged values of the dependent and the disturbances. We present the test results for autocorrelations in the table that follows.

### 4.2 Database

The database used in this study is constructed from two sources. The primary source of information relating to M&A comes from the MARR M&A Database presented by the RECOF Corporation. This database allows us to identify each type of M&A: “firm acquisitions”, “capital participation”, “capital increase”, and “mergers” (see footnote 3 for their definition).

The micro-data for firm’s behaviors, i.e. employment, output, wage and user cost of capital is collected by the Financial Statements Statistics of Corporations by Industry, made by the Policy Research Institute of the Ministry of Finance in Japan. Our estimation targets the firms whose capital is 600 million yen and over, and whose sectors exclude those of finance and insurance, due to the data availability of statistics. The sample firms, however, have wide coverage in that they include not only firms listed on the Japanese Stock Exchange Market, but also unlisted firm. The data for employment is derived from the item of “Number of employees” in the statistics, which includes part-time job workers. The data for output is from the “Sales” in the profit and loss statements. The data for wage is calculated by dividing the “Personnel expenses” by the “Number of employees”. The data for user cost of capital is from the “Interest expenses” in the profit and loss statements. We herein use nominal data, not real data, because our estimation period within thirteen years indicates price stability.

We combine the data from two sources above, and construct panel data with 9,880

sample firms for the period from 1995 to 2008 after checking the data availability of both data sources. Table 2 shows that the total number of the M&A cases between 1996 and 2008 is 3,697, including 626 cases of "firm acquisitions", 744 of "capital participation", 423 of "capital increase", and 1,904 of "mergers". The observed firms, whose number amounts to a total of 9,880, have average statistics of 1,165 employees, 86,887 million yen of sales, and 5,939 thousand yen of wages.

### 4.3 Estimation Results and Interpretations

Table 3a represents the results of the baseline estimation. The test results for autocorrelations indicates the validity of all the estimations from Equation (a) to (e), since all the AR(2) statistics reveal the absence of second-order serial correlation in the first-differenced errors. All the estimations represent that the inclusion of the lagged dependent variable of employment is positively discernable, thus implying inertia in firm employment and justifying forming the dynamic panel model; the coefficients of output, wage, and user cost of capital in the period t have expected signs at the significant level, whereas those in the period t-1 have opposite signs– especially the wage has larger degree of coefficient in the period t-1 than that in the period t, which may come from the problem of data source.[4]

As for the coefficients of the M&A dummy, the one of "firm acquisitions" is negative (though not significant) in the period of t to t-1 in Equation (a) and (e); it shifts to become significantly positive in the period of t-5 to t-7 in Equation (a), and in the period of t-4 to t-7 in Equation (e). The dummies for "capital participation" and "capital increase" do not have any significant coefficient. The coefficient of "mergers" is significantly positive in the period of t in Equation (d) and (e); It turns to be negative in the period of t-2, t-3, t-4, t-5, and t-7 (significant in the period of t-3, t-4, t-7) in Equation (d) and (e). Since Equation (a) to (d) with only one type of the M&A dummy indicate almost the same outcomes as Equation (e) with all types of the M&A dummy, we focus on the results of Equation (e) and describe the trend in the coefficients of each M&A dummy based on Equation (e) in Figure 2a. We can characterize the outcomes considering confidential interval of 90 percent, by dynamic positive effect of "firm acquisitions" on target firm's employment, and immediate positive but dynamic negative effects of "mergers" on the remaining firm's employment.

[4] The data of the Financial Statements Statistics of Corporations by Industry is based on each firm's financial statements. Each firm's financial statement differs in the starting month of fiscal year. The data may, therefore, include lagged figures in case that a firm adopts a fiscal year with an earlier starting month.

Table 3b reports the outcomes of two-sector estimation. Regarding the dummies for "firm acquisitions", the manufacturing sector has significantly positive coefficients in the period of t-2 to t-7, while the non-manufacturing sector does only in the period of t-5 and t-6. On the other hand, in the dummies for "mergers", significantly negative coefficients appear only in the t-2 period for the manufacturing sector, but in the period of t-1 to t-10 except t-8 for the non-manufacturing sector. The trends in the coefficients by sector are shown in Figure 2b. Some significant coefficients with mixed signs are found in the dummies for "capital participation" and "capital increase" by sector. Its interpretation, which seems to be rather difficult, needs further investigation. As for the estimate for in-in and out-in cases, Table 3c indicates that the significant coefficients concentrate on the manufacturing sector. It should further be noted that the coefficient of the in-in dummy for the manufacturing sector is significantly negative in the period of t-1. Figure 2c represents the trends in the coefficients for in-in and out-in cases.

We summarize and interpret the estimation results above as follows. First, the dynamic positive effect of "firm acquisitions" on a target firm's employment, which mainly appears in the manufacturing sector, may imply the firm's management improvements in the post-acquisition process. Operating efficiency can be realized often in terms of the firm's resource allocation by downsizing less profitable sections and expanding high-growth sections. The firm acquisitions may provide target firms with the opportunity to trigger and promote the firm's resource allocation, and may finally realize labor demand expansion of target firms as a result of so-called "efficiency gains" through the transfer of the firm's resources and know-how. And it seems to take some years for the target firm to finalize its resource allocation and step into the aggressive stage to expand employment in the post-acquisition process. In the context of the motives of the M&A suggested by Mueller (2003), the positive effect of on the target firm's employment may reflect such outcomes as synergy gains, economies of scale and so forth, obtained by the target firm. The case of Japan does not appear to be compatible with the "breach of trust" hypothesis suggested by Shleifer and Summers (1988), who argued that corporate takeover is nothing more than the transfer of wealth from shareholders to stakeholders such as suppliers and employees.

Second, the immediate positive effect of "mergers" on the remaining firm's employment turned to be negative in dynamic post-merger process mainly in the non-manufacturing sector. The immediate positive effect is a natural result because our analysis traces only the employment of the remaining firm among plural pre-merged companies.[5] The interesting finding, if anything, lies in the dynamic negative effect of

[5] In contrast with to our estimating result, Kubo and Saito (2007) represented a negative impact as an

"mergers". It may reflect organizational rationalization in the post-merger process, such as curtailing the excess labor in the backward and branch offices overlapped by the mergers. Especially, the gradual rationalization of branch offices in the post-merger process would be often found in the non-manufacturing sector.

Third, the difference in the employment impact between in-in cases and out-in cases lies in the existence of a significantly negative impact in in-in cases at an early stage of post-acquisition process for the manufacturing sector. Domestic acquisitions for the manufacturing sector may form a switching pattern from a negative impact to a positive impact on the target firm's employment in the dynamic post-acquisition process. This implies that domestic acquisitions often include cases whose purpose is to revitalize the target firms, in which the acquiring firms execute labor restructuring at an early stage of the firm acquisitions to downsize less profitable sections, and expand employment as a result of so-called "efficiency gains" at a later stage of the post-acquisition process. Lehto and Böckerman (2008) presented two contrasting hypotheses on domestic and cross-border M&A. One hypothesis was that radical structural reforms with considerable negative effects on employment are more often characterized by domestic M&As than cross-border ones, because the better touch of the local markets has enabled profound rationalization. The other was that cross-border M&As may cause greater employment losses than domestic ones since for foreign owners it may be easier to loosen themselves from implicit contracts that preserve employment. Our estimation outcomes seem to be consistent with the former hypothesis, whereas Lehto and Böckerman (2008)'s empirical study in Finland appears to support the latter hypothesis.

Fourth, "capital participation" and "capital increase" do not seem to produce any specific employment effect. This is probably because their activities are not accompanied with ownership change, thereby not exposing the firm to a change in organizational structure.

## 5. Concluding Remarks

This paper provides empirical evidence on the effects of M&A on employment in Japan. It contributes to the literature by capturing dynamic employment impacts of various types of M&A using the latest micro data of firms' financial statements. Our main findings are as follows: The dynamic effect of "firm acquisitions" on a target firm's employment proved to be significantly positive mainly in the manufacturing

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immediate employment effect of "merger". This is because they trace the employment of all pre-merged companies, thereby being able to estimate a net effect of "mergers".

sector, while the dynamic effect of “mergers” on the remaining firm’s employment turned out to be significantly negative mainly in the non-manufacturing sector. The switching pattern from negative impact to positive impact on a target firm’s employment in the dynamic post-acquisition process appeared more clearly in the domestic acquisition case than in the cross-border acquisition case for the manufacturing sector. We speculate that the dynamic positive employment effect of firm acquisitions reflects the efficiency gains by a firm’s management improvements in the post-acquisition process, whereas the dynamic negative employment effect of mergers implies organizational rationalization in the post-merger process.

This study is an initial step for a systematic empirical analysis of the employment effects of M&A in Japan. There seem to be several remaining issues to be addressed further. First, it might be preferable that the estimation reflects more various aspects of M&A activities. For instance, different aspects of the M&A, such as whether it is related or unrelated, friendly or hostile, etc. might produce different employment impacts. Second, analysis of M&A can take the next step by examining its wage impact as well as its employment impact, and comparing these impacts. It seems to be usual that company behaviors such as rationalization and restructuring accompany wage adjustments, as well as employment ones.

**Figure 1. M&A Developments in Number**

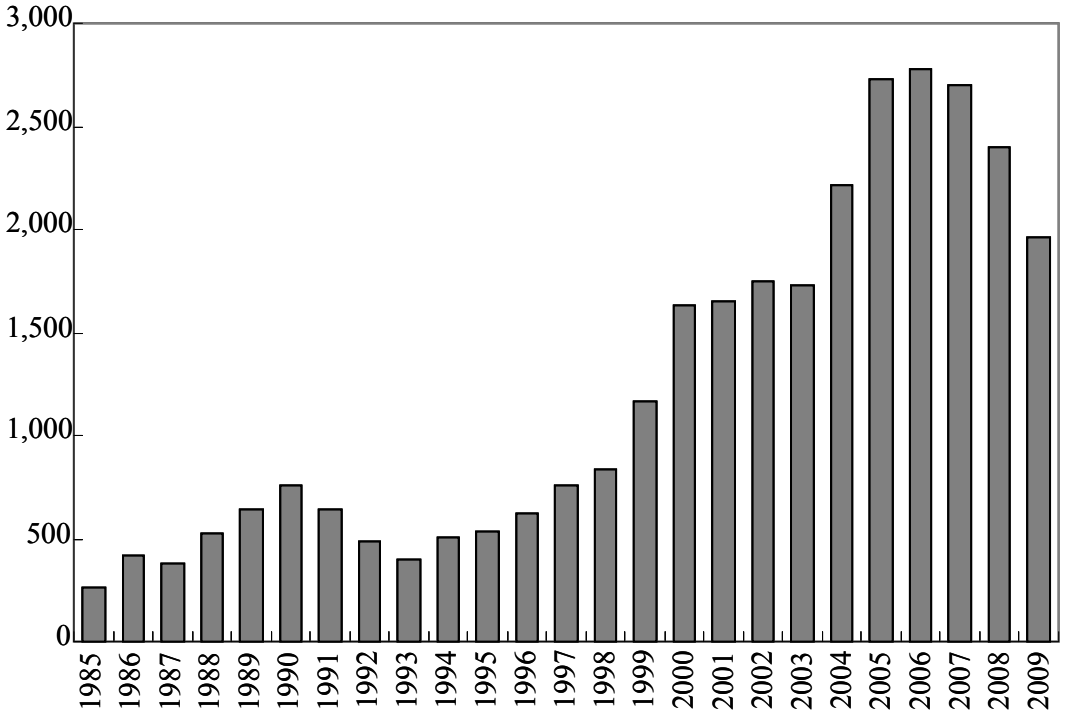



**Table 1. M&A Developments in Number Classified into Market Entry Style**

| | IN-IN | | IN-OUT | | OUT-IN | | Total |
|---|---|---|---|---|---|---|---|
| | Number | Portion % | Number | Portion % | Number | Portion % | Number |
| 1985 | 161 | 61.9 | 78 | 30.0 | 21 | 8.1 | 260 |
| 1986 | 223 | 53.3 | 181 | 43.3 | 14 | 3.3 | 418 |
| 1987 | 206 | 53.9 | 158 | 41.4 | 18 | 4.7 | 382 |
| 1988 | 218 | 41.7 | 291 | 55.6 | 14 | 2.7 | 523 |
| 1989 | 245 | 38.0 | 388 | 60.2 | 12 | 1.9 | 645 |
| 1990 | 268 | 35.5 | 463 | 61.4 | 23 | 3.1 | 754 |
| 1991 | 309 | 48.4 | 301 | 47.2 | 28 | 4.4 | 638 |
| 1992 | 253 | 52.4 | 186 | 38.5 | 44 | 9.1 | 483 |
| 1993 | 234 | 58.9 | 120 | 30.2 | 43 | 10.8 | 397 |
| 1994 | 249 | 49.3 | 196 | 38.8 | 60 | 11.9 | 505 |
| 1995 | 255 | 48.0 | 222 | 41.8 | 54 | 10.2 | 531 |
| 1996 | 320 | 51.5 | 239 | 38.5 | 62 | 10.0 | 621 |
| 1997 | 453 | 60.2 | 224 | 29.7 | 76 | 10.1 | 753 |
| 1998 | 488 | 58.5 | 236 | 28.3 | 110 | 13.2 | 834 |
| 1999 | 721 | 61.7 | 266 | 22.8 | 182 | 15.6 | 1,169 |
| 2000 | 1,066 | 65.2 | 368 | 22.5 | 201 | 12.3 | 1,635 |
| 2001 | 1,190 | 72.0 | 289 | 17.5 | 174 | 10.5 | 1,653 |
| 2002 | 1,352 | 77.2 | 264 | 15.1 | 136 | 7.8 | 1,752 |
| 2003 | 1,352 | 78.2 | 213 | 12.3 | 163 | 9.4 | 1,728 |
| 2004 | 1,680 | 76.0 | 320 | 14.5 | 211 | 9.5 | 2,211 |
| 2005 | 2,129 | 78.1 | 411 | 15.1 | 185 | 6.8 | 2,725 |
| 2006 | 2,174 | 78.3 | 421 | 15.2 | 180 | 6.5 | 2,775 |
| 2007 | 2,020 | 74.9 | 367 | 13.6 | 309 | 11.5 | 2,696 |
| 2008 | 1,824 | 76.0 | 377 | 15.7 | 198 | 8.3 | 2,399 |
| 2009 | 1,520 | 77.7 | 299 | 15.3 | 138 | 7.1 | 1,957 |

Note) M&A inside the same group is excluded.
Source) MARR M&A Database presented by the RECOF.

**Table 2. Number of the cases of M&A and observed firms**

| | Firm Acquisitions ① | | | Capital Particip. ② | | | Capital Increase ③ | | | Mergers ④ | | | ①+②+③ | | | | ①+②+③+④ | Observed Firms |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | In-in | | Out-in | | M&A Total | |
| | M. | Non-M. | Total | M. | Non-M. | Total | M. | Non-M. | Total | M. | Non-M. | Total | M. | Non-M. | M. | Non-M. | | |
| 1995 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 5,936 |
| 1996 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 9 | 23 | 32 | 0 | 0 | 1 | 0 | 35 | 6,135 |
| 1997 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 16 | 22 | 38 | 1 | 0 | 0 | 0 | 40 | 6,293 |
| 1998 | 3 | 1 | 4 | 0 | 1 | 1 | 0 | 0 | 0 | 29 | 34 | 63 | 3 | 2 | 0 | 0 | 68 | 6,300 |
| 1999 | 0 | 2 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 50 | 62 | 112 | 1 | 1 | 0 | 0 | 115 | 6,342 |
| 2000 | 8 | 4 | 12 | 8 | 15 | 23 | 4 | 3 | 7 | 44 | 71 | 115 | 14 | 10 | 2 | 1 | 157 | 6,372 |
| 2001 | 16 | 21 | 37 | 13 | 18 | 31 | 5 | 8 | 13 | 53 | 85 | 138 | 24 | 20 | 5 | 2 | 219 | 6,407 |
| 2002 | 18 | 27 | 45 | 15 | 33 | 48 | 13 | 9 | 22 | 65 | 88 | 153 | 38 | 40 | 4 | 1 | 268 | 6,551 |
| 2003 | 22 | 21 | 43 | 18 | 47 | 65 | 15 | 13 | 28 | 69 | 107 | 176 | 34 | 41 | 1 | 6 | 312 | 6,424 |
| 2004 | 13 | 66 | 79 | 25 | 79 | 104 | 25 | 26 | 51 | 81 | 102 | 183 | 49 | 99 | 3 | 11 | 417 | 6,370 |
| 2005 | 24 | 70 | 94 | 34 | 106 | 140 | 23 | 29 | 52 | 91 | 127 | 218 | 57 | 138 | 10 | 15 | 505 | 6,370 |
| 2006 | 35 | 82 | 117 | 27 | 102 | 129 | 30 | 54 | 84 | 69 | 139 | 208 | 65 | 119 | 5 | 11 | 538 | 6,175 |
| 2007 | 34 | 68 | 102 | 41 | 80 | 121 | 26 | 59 | 85 | 87 | 153 | 240 | 33 | 97 | 11 | 11 | 548 | 5,949 |
| 2008 | 19 | 71 | 90 | 21 | 57 | 78 | 24 | 55 | 79 | 89 | 139 | 228 | 47 | 83 | 8 | 4 | 475 | 5,697 |
| Total | 192 | 434 | 626 | 205 | 538 | 743 | 166 | 257 | 423 | 752 | 1,152 | 1,904 | 366 | 650 | 50 | 62 | 3,697 | 9,880[2)] |

Note: 1) M: Manufacturing sector, Non-M. Non-Manufacturing sector

2) The toal number is the one of firms observed between 1995 and 2008.

## Table 3a. Results of Baseline Estimations

| $E$ t | (a) | (b) | (c) | (d) | (e) |
|---|---|---|---|---|---|
| Const. | -1.014 *** | -1.161 *** | -1.029 *** | -1.161 *** | -1.140 *** |
| $E$ t-1 | 0.966 *** | 0.965 *** | 0.967 *** | 0.965 *** | 0.968 *** |
| $Q$ t | 0.257 *** | 0.256 *** | 0.258 *** | 0.262 *** | 0.258 *** |
| $Q$ t-1 | -0.134 *** | -0.133 *** | -0.134 *** | -0.134 *** | -0.136 *** |
| $W$ t | -0.208 *** | -0.202 *** | -0.204 *** | -0.205 *** | -0.204 *** |
| $W$ t-1 | 0.207 *** | 0.209 *** | 0.209 *** | 0.209 *** | 0.210 *** |
| $C$ t | 0.011 *** | 0.011 *** | 0.011 *** | 0.010 *** | 0.010 *** |
| $C$ t-1 | -0.004 | -0.005 * | -0.005 | -0.004 | -0.005 |
| DAt | -0.022 | | | | -0.019 |
| DAt-1 | -0.190 | | | | -0.019 |
| DAt-2 | 0.021 | | | | 0.023 |
| DAt-3 | 0.049 | | | | 0.048 |
| DAt-4 | 0.063 | | | | 0.067 * |
| DAt-5 | 0.098 ** | | | | 0.106 ** |
| DAt-6 | 0.130 *** | | | | 0.131 *** |
| DAt-7 | 0.126 ** | | | | 0.129 ** |
| DAt-8 | 0.020 | | | | 0.047 |
| DAt-9 | 0.501 | | | | 0.076 |
| DAt-10 | 0.038 | | | | 0.065 |
| DCPt | | -0.014 | | | -0.018 |
| DCPt-1 | | -0.017 | | | -0.020 |
| DCPt-2 | | 0.020 | | | 0.017 |
| DCPt-3 | | -0.009 | | | -0.015 |
| DCPt-4 | | 0.014 | | | 0.015 |
| DCPt-5 | | 0.035 | | | 0.035 |
| DCPt-6 | | -0.042 | | | -0.044 |
| DCPt-7 | | -0.057 | | | -0.058 |
| DCPt-8 | | -0.006 | | | -0.024 |
| DCPt-9 | | 0.024 | | | 0.028 |
| DCPt-10 | | -0.056 | | | -0.056 |
| DCIt | | | 0.021 | | 0.022 |
| DCIt-1 | | | -0.030 | | -0.022 |
| DCIt-2 | | | 0.010 | | 0.019 |
| DCIt-3 | | | 0.013 | | 0.026 |
| DCIt-4 | | | -0.018 | | -0.014 |
| DCIt-5 | | | 0.019 | | 0.018 |
| DCIt-6 | | | -0.062 | | -0.060 |
| DCIt-7 | | | 0.009 | | 0.022 |
| DCIt-8 | | | 0.104 | | 0.097 |
| DCIt-9 | | | collinearity | | collinearity |
| DCIt-10 | | | collinearity | | collinearity |
| DMt | | | | 0.056 *** | 0.055 *** |
| DMt-1 | | | | 0.003 | 0.002 |
| DMt-2 | | | | -0.013 | -0.015 |
| DMt-3 | | | | -0.022 * | -0.024 ** |
| DMt-4 | | | | -0.021 * | -0.022 * |
| DMt-5 | | | | -0.020 | -0.020 |
| DMt-6 | | | | 0.003 | 0.003 |
| DMt-7 | | | | -0.030 * | -0.031 * |
| DMt-8 | | | | 0.020 | 0.020 |
| DMt-9 | | | | 0.031 | 0.000 |
| DMt-10 | | | | 0.008 | 0.005 |
| Industry D. | Yes | Yes | Yes | Yes | Yes |
| AR(1) | -14.432 *** | -14.396 *** | -14.408 *** | -14.403 *** | -14.357 *** |
| AR(2) | 0.334 | 0.339 | 0.325 | 0.365 | 0.348 |

(Notes)
i) ***, **, and * indicate rejection at the 1 percent, 5 percent, and 10 percent significant levels.
ii) AR(k) signify the coefficients in the test that the average autocovariance in residuals of order k is zero.

**Figure 2a. Trends in Coefficients: Baseline Estimation**

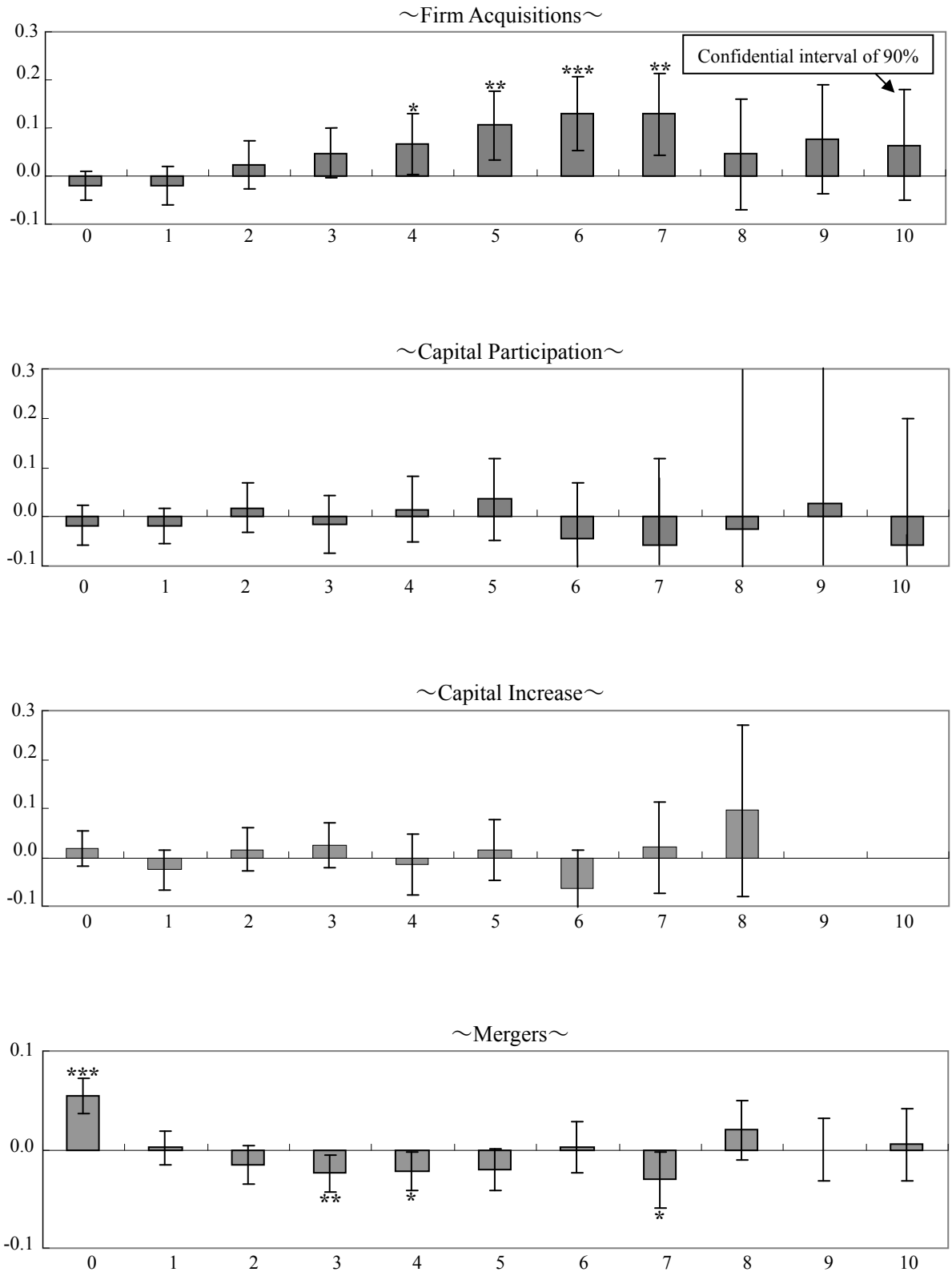


**Table 3b. Results of Estimations by Sector**

| *E* t | | | | | |
|---|---|---|---|---|---|
| Const. | -0.890 | *** | | | |
| *E* t-1 | 0.968 | *** | | | |
| *Q* t | 0.266 | *** | | | |
| *Q* t-1 | -0.155 | *** | | | |
| *W* t | -0.238 | *** | | | |
| *W* t-1 | 0.200 | *** | | | |
| *C* t | 0.010 | *** | | | |
| *C* t-1 | -0.003 | | | | |
| DA m t | -0.013 | | DA nm t | -0.006 | |
| DA m t-1 | -0.029 | | DA nm t-1 | 0.035 | |
| DA m t-2 | 0.126 | *** | DA nm t-2 | 0.020 | |
| DA m t-3 | 0.150 | *** | DA nm t-3 | 0.081 | |
| DA m t-4 | 0.156 | *** | DA nm t-4 | 0.166 | |
| DA m t-5 | 0.173 | *** | DA nm t-5 | 0.383 | ** |
| DA m t-6 | 0.228 | *** | DA nm t-6 | 0.548 | * |
| DA m t-7 | 0.169 | ** | DA nm t-7 | 0.904 | |
| DA m t-8 | 0.086 | | DA nm t-8 | 2.812 | |
| DA m t-9 | collinearity | | DA nm t-9 | 4.814 | |
| DA m t-10 | collinearity | | DA nm t-10 | 6.774 | |
| DCP m t | -0.001 | | DCP nm t | 0.000 | |
| DCP m t-1 | 0.008 | | DCP nm t-1 | 0.024 | |
| DCP m t-2 | 0.075 | * | DCP nm t-2 | 0.062 | |
| DCP m t-3 | 0.071 | ** | DCP nm t-3 | 0.043 | |
| DCP m t-4 | 0.022 | | DCP nm t-4 | 0.205 | ** |
| DCP m t-5 | 0.030 | | DCP nm t-5 | 0.342 | ** |
| DCP m t-6 | -0.116 | | DCP nm t-6 | 0.489 | ** |
| DCP m t-7 | -0.051 | | DCP nm t-7 | 1.018 | ** |
| DCP m t-8 | -0.085 | | DCP nm t-8 | 2.029 | ** |
| DCP m t-9 | 0.157 | | DCP nm t-9 | 9.102 | * |
| DCP m t-10 | 0.005 | | DCP nm t-10 | 17.299 | * |
| DCI m t | 0.006 | | DCI nm t | 0.010 | |
| DCI m t-1 | -0.007 | | DCI nm t-1 | -0.104 | ** |
| DCI m t-2 | 0.031 | | DCI nm t-2 | -0.071 | |
| DCI m t-3 | 0.046 | | DCI nm t-3 | -0.102 | * |
| DCI m t-4 | 0.039 | | DCI nm t-4 | -0.196 | *** |
| DCI m t-5 | 0.048 | | DCI nm t-5 | -0.121 | |
| DCI m t-6 | -0.013 | | DCI nm t-6 | -0.241 | *** |
| DCI m t-7 | 0.069 | | DCI nm t-7 | -0.215 | ** |
| DCI m t-8 | 0.100 | | DCI nm t-8 | -0.689 | ** |
| DCI m t-9 | collinearity | | DCI nm t-9 | collinearity | |
| DCI m t-10 | collinearity | | DCI nm t-10 | collinearity | |
| DM m t | 0.079 | *** | DM nm t | 0.031 | * |
| DM m t-1 | 0.014 | | DM nm t-1 | -0.038 | ** |
| DM m t-2 | -0.026 | * | DM nm t-2 | -0.060 | *** |
| DM m t-3 | 0.000 | | DM nm t-3 | -0.102 | *** |
| DM m t-4 | 0.005 | | DM nm t-4 | -0.099 | *** |
| DM m t-5 | 0.002 | | DM nm t-5 | -0.084 | *** |
| DM m t-6 | 0.033 | ** | DM nm t-6 | -0.078 | *** |
| DM m t-7 | 0.009 | | DM nm t-7 | -0.101 | *** |
| DM m t-8 | 0.034 | | DM nm t-8 | -0.044 | |
| DM m t-9 | 0.034 | | DM nm t-9 | -0.075 | *** |
| DM m t-10 | 0.041 | | DM nm t-10 | -0.075 | ** |
| AR(1) | -15.269 | *** | | | |
| AR(2) | 0.675 | | | | |

**Figure 2b. Trends in Coefficients: Estimation by Sector**

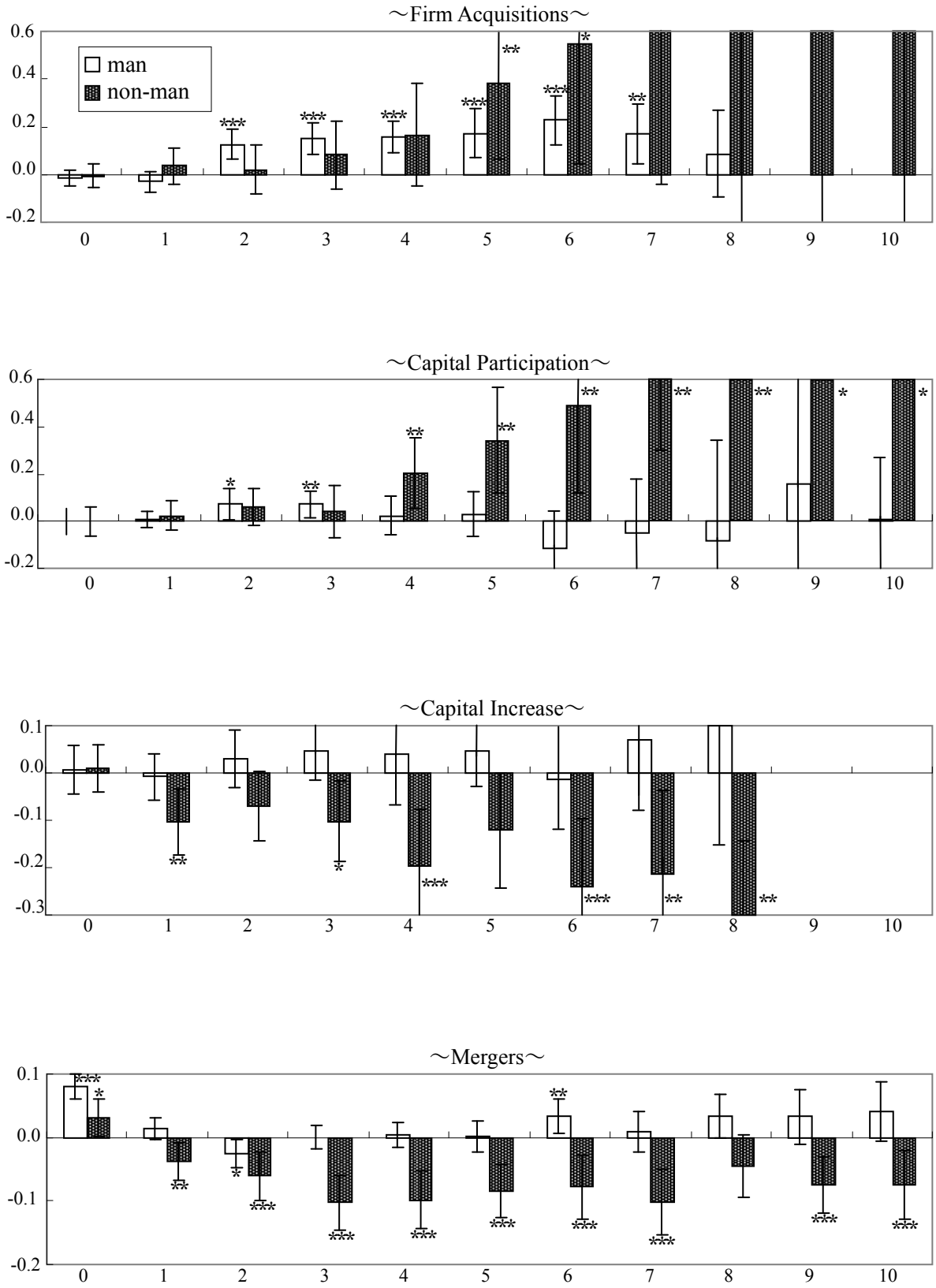
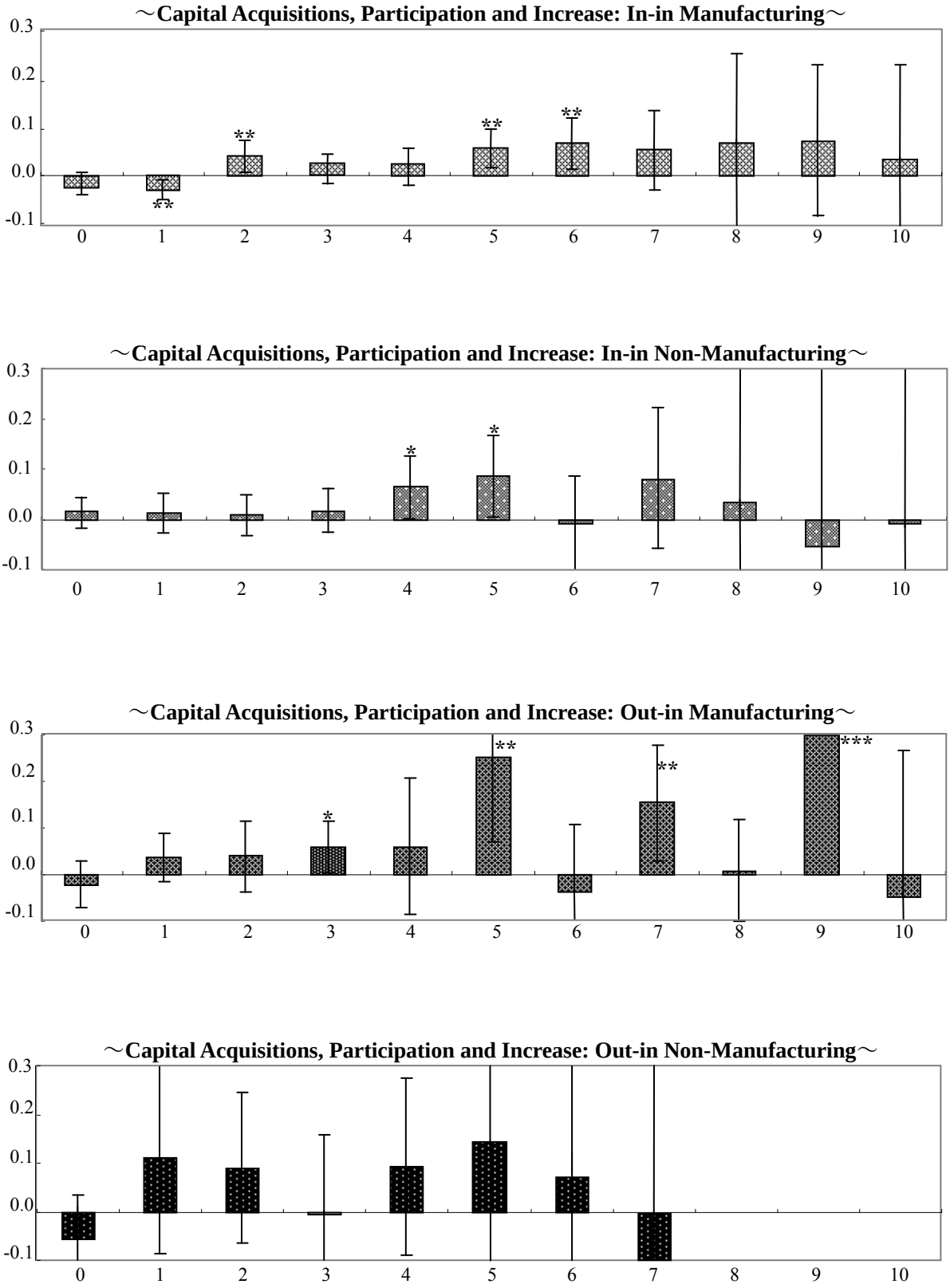


**Table 3c. Results of Estimations of In-in and Out-in Cases**

| *E* t | | | | |
|---|---|---|---|---|
| Const. | -1.019 | *** | | |
| *E* t-1 | 0.988 | *** | | |
| *Q* t | 0.265 | *** | | |
| *Q* t-1 | -0.153 | *** | | |
| *W* t | -0.190 | *** | | |
| *W* t-1 | 0.194 | *** | | |
| DACPCI_in_m t | -0.017 | | DACPCI_in_nm t | 0.015 |
| DACPCI_in_m t-1 | -0.030 | ** | DACPCI_in_nm t-1 | 0.012 |
| DACPCI_in_m t-2 | 0.042 | ** | DACPCI_in_nm t-2 | 0.009 |
| DACPCI_in_m t-3 | 0.013 | | DACPCI_in_nm t-3 | 0.017 |
| DACPCI_in_m t-4 | 0.019 | | DACPCI_in_nm t-4 | 0.064 * |
| DACPCI_in_m t-5 | 0.058 | ** | DACPCI_in_nm t-5 | 0.087 * |
| DACPCI_in_m t-6 | 0.069 | ** | DACPCI_in_nm t-6 | -0.009 |
| DACPCI_in_m t-7 | 0.054 | | DACPCI_in_nm t-7 | 0.080 |
| DACPCI_in_m t-8 | 0.069 | | DACPCI_in_nm t-8 | 0.033 |
| DACPCI_in_m t-9 | 0.073 | | DACPCI_in_nm t-9 | -0.054 |
| DACPCI_in_m t-10 | 0.035 | | DACPCI_in_nm t-10 | -0.008 |
| DACPCI_out_m t | -0.021 | | DACPCI_out_nm t | -0.055 |
| DACPCI_out_m t-1 | 0.037 | | DACPCI_out_nm t-1 | 0.109 |
| DACPCI_out_m t-2 | 0.039 | | DACPCI_out_nm t-2 | 0.090 |
| DACPCI_out_m t-3 | 0.059 | * | DACPCI_out_nm t-3 | -0.005 |
| DACPCI_out_m t-4 | 0.060 | | DACPCI_out_nm t-4 | 0.092 |
| DACPCI_out_m t-5 | 0.251 | ** | DACPCI_out_nm t-5 | 0.144 |
| DACPCI_out_m t-6 | -0.035 | | DACPCI_out_nm t-6 | 0.072 |
| DACPCI_out_m t-7 | 0.155 | ** | DACPCI_out_nm t-7 | -0.353 |
| DACPCI_out_m t-8 | 0.009 | | DACPCI_out_nm t-8 | collinearity |
| DACPCI_out_m t-9 | 0.814 | *** | DACPCI_out_nm t-9 | collinearity |
| DACPCI_out_m t-10 | -0.047 | | DACPCI_out_nm t-10 | collinearity |
| DM_m t | 0.073 | *** | DM_nm t | 0.036 ** |
| DM_m t-1 | 0.017 | | DM_nm t-1 | -0.020 |
| DM_m t-2 | -0.030 | ** | DM_nm t-2 | -0.048 ** |
| DM_m t-3 | -0.015 | | DM_nm t-3 | -0.075 *** |
| DM_m t-4 | 0.005 | | DM_nm t-4 | -0.071 *** |
| DM_m t-5 | 0.004 | | DM_nm t-5 | -0.060 ** |
| DM_m t-6 | 0.026 | * | DM_nm t-6 | -0.084 *** |
| DM_m t-7 | -0.043 | ** | DM_nm t-7 | -0.088 *** |
| DM_m t-8 | 0.002 | | DM_nm t-8 | -0.023 |
| DM_m t-9 | -0.004 | | DM_nm t-9 | -0.050 * |
| DM_m t-10 | 0.024 | | DM_nm t-10 | -0.014 |
| AR(1) | -15.137 | *** | | |
| AR(2) | 0.080 | | | |

**Figure 2c. Trends in Coefficients: Estimation of In-in and Out-in Cases**



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