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The effect of investment funds on employment and wages¹

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Abstract

We study the effect of investment funds on wages and employment in Japan, with particular emphasis on the possible conflicts of interest between investment funds and the employees of target firms. Investment funds may try to gain profit by reducing wages and employee numbers. We contribute to the literature by analyzing the effect of investment fund on wages and employment in listed firms in Japan, using data from 2007 to 2017. Considering that the activity of investment funds varies across countries, we surmised that it would be interesting to examine Japan's data. We employ propensity score matching difference in difference method and a triple difference model to examine the impact of investment funds on employment conditions. It is shown that in general, there is a decrease in the number of employees in target firms.

Keywords: corporate governance, ownership structure, investment fund, employment, wages

JEL classification: G34, J23, J31, L22

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1. Introduction

We study the effect of investment funds¹ on wages and employment of target firms in Japan. Investment funds, such as activist hedge funds and private equity funds, began operating in the late 1990s (Buchanan et al., 2012; Hamao and Matos, 2018; Kubo, 2014). Several studies have shown that the funds' investments have yielded positive returns in Japan (Buchanan et al., 2012; Hamao and Matos, 2018; Inoue and Kato, 2007; Nose and Ito, 2009, 2011; Uchida and Xu, 2008). Such results are consistent with several studies in the US, which have observed short-term positive returns for funds (Brav et al., 2008; Clifford, 2008; Greenwood and Schor, 2009; Klein and Zur, 2009)².

However, sometimes a severe conflict of interest arises between an investment fund and the employees of the target firms. According to Buchanan et al. (2012), who describe an attempt by an activist hedge fund to acquire a Japanese firm, employees and other stakeholders strongly oppose their companies being acquired. Labor unions express concerns that investment funds may have a negative impact on employees (Japan Trade Union Confederation, 2007, 2009). As explained by the Japan Trade Union Confederation (2009), the largest trade union national center, "many workers employed by companies owned by investment funds remain under unstable circumstances, and these workers may find themselves in far harsher conditions if investment funds hard-pressed for capital resell their stock holdings." Shleifer and Summers (1988) show that it may be possible for outside investors to gain profits when the wages of some employees exceed their productivity through implicit contracts.

Several papers provide quantitative analyses of the effect of investment funds on employment in target firms (Amess and Wright, 2012; Antoni et al., 2019; Bernstein et al., 2017; Boucly et al., 2011; Davis et al., 2013; Goergen et al., 2011; Guery et al., 2017). The results of these papers are not conclusive. Some studies find that the impact

¹ In particular, we focus on investments of 5% or more by funds in all listed companies in Japan. Funds are defined as "investment companies (investment)" and "venture investment (operating companies) (CVC)" in the RECOF M&A Database. The events covered are capital participation and capital expansions. Among the investments in the sample, the highest stake was 38%.

² Brav et al. (2008) analyze the pre-and post-investment returns of hedge funds and observes abnormal returns of about 7%. Klein and Zur (2009) observe abnormal returns of about 10% for hedge funds and about 5% for other activists in a short-run analysis. Greenwood and Schor (2009) observe significant positive abnormal returns for targets invested by hedge funds and eventually acquired.

on employment is positive (Boucly et al., 2011; Bernstein et al., 2017), whereas others observe a decrease in employee numbers of target firms (Amess et al., 2014; Antoni et al., 2019; Davis et al., 2013; Goergen et al., 2011). Some papers report that wages decrease after being acquired by an investment fund, whereas others find insignificant results. Olsson and Tåg (2017) observe a significant decrease in wages for routine workers and outsourceable employees of low productivity target companies. Antoni et al. (2019) demonstrate that wages decline after private equity investments. Conversely, Amess et al. (2014) argue that the effect of leveraged buyouts (LBOs) on wages is not significant.

We contribute to the literature by analyzing the effect of investment funds on wages and employment in listed firms in Japan, using data for the period from 2007 to 2017. Our propensity score matching difference-in-difference estimation shows that, in general, both employment and wages decrease after acquisition by an investment fund.

Many previous studies implicitly assume that the effects of investment funds on employment and wages are similar across firms. However, it might be the case that effects differ according to the characteristics of the acquired firms. For example, investment funds may seek profits by reducing employee numbers only when an acquired firm has excess employees. One of our most important contributions is that we consider the possibility that the effect of investment funds varies according to the firm's characteristics. For example, it has been predicted that investment funds will reduce the number of employees in firms with many excess employees³. To examine this prediction, we employ a triple-difference model to investigate whether the impact on employees varies between firms with different characteristics. Our empirical analysis reveals that investment funds are more likely to decrease wages in firms with low productivity.

Our second contribution is that we classify investment funds according to their type and country of origin. Often, studies on investment funds focus on the effect of particular types of investment, such as LBOs or investment by private equity funds. Amess and Wright (2007) examine the impact of private equity LBOs on the number of employees in UK target firms and do not observe a significant effect. Bacon et al. (2013) provide a review of the literature and find that there is no systematic decrease in employment after investment by private equity funds. Amess and Wright (2007) show

³ Olsson and Tåg (2017) observed a significant reduction in the number of employees in firms with low productivity.

there is a negative relationship between buyouts and wage growth. To examine the effect of different types of investment funds, we classify investment funds into activist and nonactivist funds. Furthermore, we estimate the effect of the country of origin of the investment fund. Guery et al. (2017) compare the activity of French and foreign private equity funds in France and conclude that there is a strong country of origin effect in the activity of private equity funds.

Our empirical analysis shows that the impact of investment varies according to the types of investment funds. Firms acquired by both activist and nonactivist funds tend to reduce employment compared with other firms. In addition, the reduction in employment is larger in firms acquired by activist investment funds, and firms acquired by activist funds are more likely to reduce wages. Furthermore, we find that the behavior of the investment funds varies according to their country of origin. Firms acquired by domestic funds tend to reduce wages, whereas no such trend is observed for firms acquired by foreign funds.

Another contribution of this study is that we use Japanese data. Many previous studies on the effect of investment funds' activity on employment conditions use data from the US, UK, or Europe⁴. Japan is a unique testing ground for this topic because one of the main characteristics of its labor market is long-term employment (Kambayashi and Kato, 2017; Kawaguchi and Ueno, 2013; Ono, 2010; Suzuki et al. 2015). Therefore, there may be relatively more firms with excess employees in Japan. Investment funds may be able to gain profits by cutting jobs in these firms. Firms in Japan tend to keep the number of employees steady, even when they are not making profits, by hiring less or transferring employees to other divisions (Kato, 2001; Kester, 1991; Nakata and Takehiro, 2003; Noda, 2013; Suruga, 1998). Managers are reluctant to reduce the number of employees unless they face strong pressure from the financial market⁵.

The remainder of this paper is structured as follows. Section 2 describes the data and descriptive statistics. Section 3 analyzes the impact of investment funds on employment and wages. Section 4 presents the results when we classify investment funds by their types and nationalities. The results of the triple-difference model are presented

⁴ Boucly et al. (2011) and Guery et al. (2017) use data from France. Olsson and Tåg (2017) and Antoni et al. (2019) use data from Sweden and Germany, respectively.

⁵ Bertrand and Mullainathan (2003), Ikeda et al. (2018) suggest managers tend to avoid conflict with employees.

in Section 5. Section 6 concludes.

2. Data

Our sample consists of around 500 listed firms for the period 2007–2017 in Japan. The data on investment funds were obtained from the RECOF M&A database; financial and employment information (including the number of employees, average annual salary, average age, and average years of service) were obtained from the Corporate Financial Data Bank of the Development Bank of Japan. Financial information such as market capitalization and return on assets (ROA) was obtained from the Nikkei NEEDS Corporate Governance Evaluation System, and the information on firms' founding years was obtained from Nikkei NEEDS-FinancialQUEST. Our data are winsorized at the 1% and 99% levels.

There were around 1,000 investments by investment funds in listed companies in Japan during the sample period. We exclude cases for which we cannot obtain financial information. In cases where the same firms are acquired more than once by investment funds, we only use the first acquisition.

To observe the impact of investment funds on employees, we need to exclude changes in the number of employees caused by events unrelated to the funds, such as major mergers or transitions to a pure holding company. We excluded samples where we observed a change in the number of employees of more than 50% compared with the previous year's level. We also exclude relatively small companies with less than 50 employees because funds may not be able to make large reductions in the number of employees in these firms. In addition, companies related to finance were excluded from the sample⁶. After the exclusions, our final sample consisted of 253 events.

2.1. Investment funds

Table 1 presents the details on the investment funds in our study. Column 2 shows the number of investments; the funds were most active during 2007, but the number of investments declined sharply after the financial crisis in 2008. Column 4

⁶ Specifically, we have excluded companies whose industry codes in the TSE 33 classification are "7050," "7100," "7150," and "7200".

represents the average investment ratio, the proportion of shares owned by funds after investment. The investment ratio is highest in 2016, which is consistent with an increase in average transaction value in the same year, shown in Column 3. When we classify investment funds by their country of origin, it is evident that there are more foreign than domestic funds. In particular, the number of investments by US funds is larger than those of Japanese funds. After classifying investment funds as activist or nonactivist based on the RECOF database classification, Table 1 indicates that the number of activist funds is larger than that of nonactivist funds.

2.2. Matching

When analyzing the impact of funds' investments on employment conditions, it is important to consider possible biases. There may be differences in characteristics between the firms in which the funds choose to invest and those in which they do not invest. If this is the case, differences in employment and wages between the two groups may not be driven by the investment funds but by other factors. For example, firms are more likely to cut jobs when their performance is poor. If funds tend to target low-performing firms, and if the variable on performance is not controlled, we may observe a negative relationship between funds' investments and employment, but it would be inaccurate to attribute its cause to the funds.

We use propensity score matching to address the above endogeneity problem. Several other studies analyzing the impact of funds on employment and wages use this method (Guery et al., 2017; Olsson and Tåg, 2017)⁷. The propensity score is the potential probability of receiving treatment or the probability of being acquired by the investment funds. Firms are matched with each other based on this probability. Through this matching process, we can compare the change in employment and wages between firms in which funds invested (treatment firms) and other firms (control firms). When matching, we use the one-to-one nearest neighbor matching approach with replacement. This means that there is one control firm match for each firm in which funds invest, and the control firm

⁷ There are empirical studies that use instrumental variable methods to deal with endogeneity. However, to our knowledge, there are no such studies in the investment fund literature. All of the financial and equity variables that have been identified as potentially influencing target firm selection by investment funds also affect employment. Therefore, it is difficult to find appropriate instrumental variables that affect the explanatory variables but do not directly affect the explained variables.

may be matched with one or more treated firms.

The propensity score is calculated using a probit model, in which the dependent variable is a dummy variable that takes a value of one if a firm has been invested in by a fund, and the explanatory variables are the industry, number of employees, number of employees squared, firm age, average employee age, average years of service, and year of establishment, following Olsson and Tåg (2017). In addition, we include variables related to firm finances, following Hamao and Matos (2018), who suggest that funds consider the following variables when selecting target companies: equity market capitalization (log), Tobin's q , sales, sales change, ROA, the debt ratio, the cash-to-cash ratio, the ratio of dividends to net income, and the ratio of share buybacks to net income. All independent variables are lagged one year. We include the cash and deposit ratio because studies suggest that investment funds focus on the cash and deposits held by Japanese firms because they attempt to transfer cash and deposits to shareholders in the form of dividends and share buybacks (Hamao and Matos, 2018; Inoue and Kato, 2007;). By using propensity score matching, we can find control firms with similar characteristics.

2.3. Basic statistics

Table 2 shows the descriptive statistics for the sample firms. Panel A shows the basic statistics before matching, whereas Panel B shows the results after matching. These panels show the results for the tests of the difference between the means and medians of the two groups. Panel A shows that there are significant differences in employment and financial variables between firms that are targets of investment funds and other firms. It is evident that there are many differences between the two groups. First, the target companies are larger in terms of sales and number of employees, as shown by previous studies (Olsson and Tåg, 2017). Second, target firms are more likely to achieve higher performance in terms of stock market capitalization, Tobin's q , and price to book value ratios (PBRs)⁸. Third, the foreign shareholding ratio of the target firms is significantly higher. Again, this is consistent with the results of previous studies (Hamao and Matos, 2018). This suggests that the investment funds have low shareholdings and require additional shareholders who are in favor of making changes. In addition, there are

⁸ Our result is not consistent with previous studies, which report that target firms have lower PBRs (Inoue and Kato, 2007).

differences in employee-related variables, such as the average wage, the average age, and the length of service of employees.

The most important message from Panel A of Table 2 is that the characteristics of the target and other firms differ significantly. This makes it difficult to determine whether the differences between the target and other firms are due to acquisition by investment funds or other factors. To overcome this problem, we need a control group that adjusts for characteristics. Therefore, we use the propensity matching method to create a control group. Panel B of Table 2 compares the treatment and control groups and indicates that the characteristics of the target and control firms are similar. There are many variables with significant differences in Panel A, but the differences are not significant in Panel B. Therefore, we can use the matching sample to investigate the effect of investment funds.

2.4. Comparison of changes in employment and wage variables

Table 3 shows the change in the number of employees and wages in the three years before and after acquisition by investment funds for treated and control firms. The purpose of the table is to examine whether firms in which investment funds invest (treated firms) are more likely to reduce the number of employees and cut wages compared with other firms. If the investment funds attempt to increase profits by reducing the number of employees and cutting wages, then a reduction in employee numbers and wages should be evident in treated firms. In addition, we provide the results of t tests on the mean differences in each year.

Panel A shows that the number of employees increases in both treatment and control group firms. Typically, the number of employees in treated firms is 1,518 three years before treatment, and 1,566 three years after treatment. In other words, there is little change in the number of employees in firms in which funds invest. Similarly, among control group firms, in which funds do not invest, the number of employees increases over the same period from 1,376 to 1,612. In other words, the increase in the number of employees is much smaller in treated firms.

Panel B shows the change in wages. In treated firms, there is little change in wages around investment fund acquisitions; the average wage is around 6.28 million yen three years before the investment and 6.32 million yen three years after. For the same time period, wages increase in control firms from around 6.33 million yen to 6.52 million

yen. The differences between the two groups are not significant before investment funds invest, but are significant afterward. In summary, the growth of employment and wages is smaller in firms in which investment funds invest.

3. Regression analysis of the impact of the fund investments on employment and wages

In this section, we report the results of regression analyses with employee numbers and wages as the dependent variables to investigate the impact of investment funds.

3.1. Employee numbers and wages

First, we run a regression analysis on the number of employees as the dependent variable, with the following difference-in-difference model:

$$\begin{aligned} &\text{The number of employees} \\ &= \alpha_1 + \alpha_2 \text{ Post} + \alpha_3 \text{ investment} + \alpha_4 \text{ Post} \times \text{investment} + \alpha_7 \text{ year} + \varepsilon_1 \end{aligned}$$

The dependent variable is the number of employees and year denotes the year dummies. Investment is a dummy variable that takes a value of one for target firms. Post is a dummy variable that takes a value of one for target firms after investment. For control firms, this variable takes a value of one after the year of the match. Using these two variables, we can obtain a coefficient that shows the difference in the change in employee numbers between target and control firms. We focus on $\text{Post} \times \text{investment}$ which is the interaction term of the two variables above. The coefficient of this variable, α_4 , indicates the difference in the change in employee numbers. The sign of the coefficient α_4 is expected to be negative if firms reduce employee numbers after the investment by the fund. We use observations from three years before to three years after the investment⁹. We use ordinary least squares, with robust standard errors clustered at the firm level.

Columns 1 and 3 of Table 4 show the results for employee numbers with and

⁹ We excluded an observation for the investment year because it is not clear whether the values are recorded before or after the investment.

without year dummies, respectively. One of the most important results in this table is that employee numbers decrease after the investment by funds. The coefficients for $\text{Post} \times \text{Investments}$ are negative and significant in both equations¹⁰. In other words, the change in employee numbers in the firms in which investment funds invest is significantly smaller than is the case for control group firms. The coefficient for the variable $\text{Post} \times \text{investment}$ is around -226 and significant. In other words, the number of employees in target firms declines by an extra 226 persons compared with control firms. This result is consistent with the idea that investment funds reduce the number of employees after investment.

We estimate the effect of investment funds on wages using a similar equation. Columns 2 and 4 show the results for wages. It is clear that the wages in target firms are lower after these firms are acquired by investment funds compared with other firms. In Column 2, the coefficient for the variable $\text{Post} \times \text{investment}$ is $-201,132$ and significant. In other words, after investment, the average wage in target firms is 201,132 yen less than in the control group firms. These results are consistent with the idea that employment conditions become worse when firms are acquired by investment funds.

4 Different types of investment funds

In this section, we classify investment funds into various categories. First, we classify investment funds into activist and nonactivist funds to test whether the former tend to reduce employment and wages more than the latter. Often, activist funds are considered, by definition, to more actively monitor the firm in which they invest, and they are more likely to try to influence important decisions. They may send outside directors to the board of directors or replace chief executive officers. To examine whether the effect of activist funds is different from that of nonactivist funds, we divide the fund dummy

¹⁰ We do not include other control variables in our main analysis because they are controlled when we create the matching sample. As a robustness check, we estimate the regression including more control variables, namely, average annual salary, average employee age, average years of service, firm age, log (tangible assets), total sales, total number of segments, log (market capitalization), Tobin's q, PBR, total sales growth, ROA, debt ratio, cash to cash ratio, dividends as a percentage of net income, share buybacks as a percentage of net income, and foreign ownership ratios. The results are qualitatively similar to the results presented above.

into an activist fund dummy and a nonactivist fund dummy. If activist funds try to improve profits by reducing employee numbers or wages, the coefficient for the interaction term between Post (post-acquisition dummy) and Activist would be larger than that for the variable $\text{Post} \times \text{nonactivist}$.

The results are shown in Table 5. Columns 1 and 3 show the impact on employment, whereas Columns 2 and 4 show the results for wages. One of the most important results is that the impact of activist funds is stronger than that of nonactivist funds. In Column 1, the coefficient for the interaction term $\text{Post} \times \text{Activist}$ is -261.5 and significant, showing that employee numbers decrease in the firms acquired by activist funds. The coefficient for the interaction term between Post and nonactivist is smaller and not significant.

The effect on wages is shown in Columns 2 and 4. The coefficient for the interaction term between Post and Activist is negative and significant, whereas this is not the case for the coefficient for $\text{Post} \times \text{nonactivist}$. In other words, wages are more likely to decrease in the firms acquired by activist funds. These results indicate that activist and nonactivist funds behave in different ways.

Next, we categorize investment funds by their country of origin. According to previous studies, the behavior of funds may differ depending on their origin. For example, in France, Guery et al. (2017), found that firms acquired by private equity funds outside France reduced employee numbers more than did firms acquired by French private equity funds. We classified the origins of funds into five categories: the US (USA), the United Kingdom (GBR), Japan (JPN), Singapore (SIN) and other countries (Others).

The results are shown in Table 6. In this section, we focus on the interaction term of the post-acquisition dummy (Post) and the fund's country of origin. One of the most important features of Table 6 is that the impact on employment and wages is not identical across countries, although employment tends to decline in companies acquired by funds of all nationalities. According to Column 1, the decline in employment is similar between firms acquired by US funds and those acquired by Japanese funds. However, the coefficient of the interaction term is not significant for funds in the UK.

One of the most important results in the table is that the impact on wages differs between firms acquired by Japanese funds and those acquired by funds of other countries. The coefficient for the interaction term between Post and the Japanese fund dummy is negative and significant at the 1% level, whereas coefficients for other interaction terms

are not significant. In other words, wages decline in firms acquired by Japanese funds but do not decline in firms acquired by funds of other countries.

5. Triple-difference model

In this section, we use the triple-difference approach to conduct additional regression analyses on the effect of investment funds on employment and wages.

5.1. Differences in the effects of the investment funds due to excess employees

The behavior of the funds might vary according to the characteristics of the firm in which they invest. They may reduce the employee numbers only when there are excess employees, for example. If this is the case, we may not be able to observe the effect of investment funds correctly because the regression analyses in Table 4 do not take into account the financial condition of the target firms. First, we calculate whether the firm has excess employees. We create an excess employee dummy, which takes a value of one if the firm has excess employees. Then, we examine whether the impacts of the investment fund on employment and wages vary according to the excess-employee dummy.

To calculate excess employees, we estimate the following regression:

$$\text{Employee} = \alpha_1 + \alpha_2 \text{industry} + \alpha_3 \text{sales} + \varepsilon_1$$

We calculate the predicted value of the number of employees after estimating the above equation. The variable excess employees is calculated by subtracting this predicted value from the actual number of employees. Next, we use the following triple-difference model to examine the difference in the impact of the funds on employment and wages depending on the number of excess employees. We use similar regression for wages.

The number of employees

$$\begin{aligned} &= \alpha_1 + \alpha_2 \text{Post} + \alpha_3 \text{investment} + \alpha_4 \text{excess employee} + \alpha_5 \text{Post} \times \text{investment} + \\ &\alpha_6 \text{Post} \times \text{excess employee} + \alpha_7 \text{investment} \times \text{excess employee} + \alpha_8 \text{Post} \times \text{investment} \times \\ &\text{excess employee} + \varepsilon_1 \end{aligned}$$

The dependent variables are the number of employees and wages. The period, Post, investment, firm, year, and industry are the same as in the previous sections. Excess employee is a dummy variable that takes a value of one if the number of excess employees one period before the investment is greater than zero (positive). We focus on the coefficient of $\text{Post} \times \text{investment} \times \text{excess employee}$, α_8 , which shows the impact of the fund on the employee numbers and wages in a portfolio company with excess employees. If the number of employees or wages are more likely to be reduced in firms with excess employees, the coefficient would be negative and significant.

The results of this analysis are presented in Table 7, Panel A. In the analysis of employee numbers, the coefficients for triple differences are negative but not significant. The coefficients are not significant in regressions in which the dependent variables are wages. In other words, we do not observe any evidence that excess employees influence the effect of the funds in this analysis.

5.2. Differences in the effects of investment funds by firm productivity

In this subsection, we conduct another triple-difference model by classifying firms according to their productivity. It is possible that investment funds reduce employment and wages if the target firm's productivity is low. This is consistent with previous studies showing that firms reduce employee numbers when firm performance is not satisfactory (Noda, 2013). We use the following triple-difference model to examine the difference in the impact of the funds on employment depending on the productivity of the firm.

The number of employees

$$= \alpha_1 + \alpha_2 \text{Post} + \alpha_3 \text{investment} + \alpha_4 \text{low productivity} + \alpha_5 \text{Post} \times \text{investment} + \alpha_6 \text{Post} \times \text{low productivity} + \alpha_7 \text{investment} \times \text{low productivity} + \alpha_8 \text{Post} \times \text{investment} \times \text{low productivity} + \alpha_9 \text{employment} + \alpha_{10} \text{firm} + \alpha_{11} \text{year} + \alpha_{12} \text{industry} + \varepsilon_1$$

Low productivity is a dummy variable that takes a value of one if operating income per capita one period before investment fund investment is lower than the industry median. The results for the number of employees are presented in Panel B of Table 7. The most important result is that the coefficient for triple difference $\text{Post} \times \text{investment} \times \text{low}$

productivity is negative and significant for wages. In other words, firms with lower productivity are more likely to decrease wages when acquired by investment funds.

6. Conclusion

This study analyzes the impact of investment funds on the employees of the portfolio companies in terms of employment and wages. We summarize our results as follows. The most important result is that both employment and wages decrease after acquisition by investment funds. The reduction in the number of employees is larger in firms that are acquired by activist funds than in those acquired by nonactivist funds. Moreover, activist funds are more likely to decrease employees' wages. In addition, we find that the funds' country of origin matters. In particular, firms acquired by domestic funds are more likely to reduce wages and to make larger reductions in employee numbers. We also find that firms with lower productivity are more likely to decrease employees' wages after the investment by funds.

There are several limitations in this paper that should be considered in the future. First, we have not examined the interaction between firm performance and employment conditions. Second, we have not assessed whether there is a trade union in the target firm.

References

Amess, K., Girma, S., Wright, M. 2014. “The wage and employment consequences of ownership change.” *Managerial and Decision Economics*, Vol. 35(2), pp. 161–71.

Amess, K., Wright, M., 2007. “The wage and employment effects of leveraged buyouts in the UK.” *International Journal of the Economics of Business*, Vol. 14(2) (July 2007), pp. 179–95.

Amess, K., Wright, M. 2012. “Leveraged buyouts, private equity, and jobs.” *Small Business Economics*, Vol. 38(4), pp. 419–30.

Antoni, M., Maug, E., Obernberger, S. 2019. “Private equity and human capital risk.” *Journal of Financial Economics*, Vol. 133(3), pp. 634–57.

Bacon, Nick, Mike Wright, Rod Ball, and Miguel Meuleman. 2013 “Private Equity, HRM, and Employment.” *Academy of Management Perspectives* , Vol. 27(1), pp7-21

Bernstein, S., Lerner, J. Sorensen, M. Strömberg, P. 2017. “Private equity and industry performance.” *Management Science*, Vol. 63(4), pp. 1198–213.

Bertrand, M., Mullainathan, S. 2003. “Enjoying the quiet life? Corporate governance and managerial preferences.” *Journal of Political Economy*, Vol. 111(5), pp. 1043–75.

Boucly, Q., Sraer, D.A., Thesmar, D. 2011. “Growth LBOs.” *Journal of Financial Economics*, Vol. 102(2), pp. 432–53.

Brav, A., Jiang, W., Partnoy, F., Thomas, R. 2008. “Hedge fund activism, corporate governance, and firm performance.” *The Journal of Finance*, Vol. 63(4), pp. 1729–75.

Buchanan, J., Chai, D., Deakin, S. 2012. *Hedge Fund Activism in Japan: The Limits of Shareholder Primacy*. Cambridge: Cambridge University Press.

Clifford, C. 2008. "Value creation or destruction? Hedge funds as shareholder activists." *Journal of Corporate Finance*, Vol. 14(4), pp. 323–36.

Davis, S., Haltiwanger, J., Handley, K., Jarmin, R., Lerner, J., Miranda, J.. 2013. "Private equity, jobs, and productivity." *The American Economic Review*, Vol. 104(12), pp. 3956–90.

Goergen, M., O'Sullivan, N., Wood, G. 2011. "Private equity takeovers and employment in the UK: Some empirical evidence." *Corporate Governance: An International Review*, Vol. 19(3), pp. 259–75.

Goergen, M., O'Sullivan, N., Wood, G. 2014. "The employment consequences of private equity acquisitions: The case of institutional buy outs." *European Economic Review*, Vol. 71, pp. 67–79.

Greenwood, R., Schor, M. 2009. "Investor activism and takeovers." *Journal of Financial Economics*, Vol. 92(3), pp. 362–75.

Guery, L., Stevenot, A., Wood, G. 2017. "The impact of private equity on employment: the consequences of fund country of origin—New evidence from France." *Industrial Relations: A Journal of Economy and Society*, Vol. 56(4), pp. 723–50.

Hamao, Y., Matos, P. 2018. "US-style investor activism in Japan: The first ten years?" *Journal of the Japanese and International Economies*, Vol. 48(C), pp. 29–54.

Ikeda, N., Inoue, K., Watanabe, S. 2018. "Enjoying the quiet life: Corporate decision-making by entrenched managers." *Journal of the Japanese and International Economies*, Vol. 47, pp. 55–69.

Inoue, K., Kato, H. 2007. “*Akuthibisutofandono kozai*”(The merits and demerits of activist funds) *Keizai kenkyu*, Vol. 58(3), pp. 203–16.

Japan Trade Union Confederation. 2007. A RENGO Perspective—Approaches and policy issues concerning hedge and private equity funds, retrieved from <http://www.jtuc-rengo.org/specialtopics/data/hedgeandpefunds.pdf> on Dec. 5, 2020.

Japan Trade Union Confederation. 2009. A RENGO Perspective on the corporate legal framework and investment-fund regulations, retrieved from <http://www.jtuc-rengo.org/specialtopics/20090122.html> on Dec. 5, 2020.

Kambayashi, R., Kato, T. 2017. “Long-term employment and job security over the past 25 years: A comparative study of Japan and the United States.” *Industrial and Labor Relations Review*, Vol. 70(2), pp. 359–94.

Kato, T. 2001. “The end of lifetime employment in Japan?: Evidence from national surveys and field research.” *Journal of the Japanese and International Economies*, Vol. 15(4), pp. 489–514.

Kawaguchi, D., Ueno, Y. 2013. “Declining long-term employment in Japan.” *Journal of the Japanese and International Economies*, Vol. 28(C), pp. 19–36.

Kester, C. 1991. *Japanese Takeovers: The Global Contest For Corporate Control*. Harvard Business School Press: Boston, MA.

Klein, A., Zur, E. 2009. “Entrepreneurial shareholder activism: hedge funds and other private investors.” *The Journal of Finance*, Vol. 92(3), pp. 362–75.

Kubo, K. 2014 “Japan: Limits to investment fund activity.” In: H. Gospel, A. Pendleton, and S. Vitols (eds), *Financialization, New Investment Funds, and Labor: An International Comparison*. Oxford: Oxford University Press. pp. 290–312.

Nakata, Y., Takehiro, R. 2003. "Total labor costs and employment adjustment behavior". In: S. Ogura, T. Tachibanaki, and D. A. Wise (eds.), *Labor Markets and Firm Benefit Policies in Japan and the United States*. Chicago: University of Chicago Press, pp. 135–55.

Noda, T. 2013. "Determinants of the timing of downsizing among large Japanese firms: Long-term employment practices and corporate governance." *The Japanese Economic Review*, Vol. 64(3), pp. 363–98.

Nose, Y., Ito, A. 2009 "*Baiauto fandoniyoru baisyuno inpakutoni kansuru bunseki*" (The impact of the buyout fund) (in Japanese). *Gendai Finance*, Vol. 26, pp. 49–66.

Nose, Y., Ito, A. 2011 "*Kokai Izigata Biauto Zisshi Kigyo no Choki Pafomansu*" (The long-term performance of PIPEs in Japan) (in Japanese), Hitotsubashi IS-FS Working Paper Series FS-2011-J-002, Hitotsubashi University.

Olsson, M., Tåg, J. 2017. "Private equity, layoffs, and job polarization" *Journal of Labor Economics*, Vol. 35(3), pp. 697–754.

Ono, H., 2010. "Lifetime employment in Japan: Concepts and measurements." *Journal of the Japanese and International Economies*, Vol. 24(1), pp. 1–27.

Shleifer, A., Summers, L. 1988. "Breach of trust in takeovers." In: A. Auerbach (ed.), *Corporate Takeovers: Causes and Consequences*. University of Chicago Press, Chicago, pp. 33–56.

Suruga T. 1998 "Employment adjustment in Japanese firms: Negative profits and dismissals". In: I. Ohashi and T. Tachibanaki (eds.), *Internal Labor Markets, Incentives and Employment*. London: Macmillan Press.

Suzuki, H., Kubo, K., Ogura, K., 2015. "Employment relations in Japan". In: G.J. Bamber, R.D. Lansbury, N. Wailes, C.F. Wright (eds). *International and Comparative Employment Relations* (Sixth edition). SAGE Publications Ltd. pp. 237–65.

Uchida, K., P. Xu. 2008. "US barbarians at the Japan gate: Cross border hedge fund activism," Bank of Japan Working Paper Series No. 08-E-3, February.

Table 1 Investment funds

	Number	Value(million yen)	Investment ratio(%)	USA	JPN	SIN	GBR	other	activist	Non activist
2007	51	8230.50	11.60	32	9	1	6	3	27	24
2008	25	2463.67	8.59	7	5	5	8	2	20	5
2009	4	4256.50	13.66	1	1	1	1	1	2	2
2010	5	5601.67	12.86	1	2	4	6	1	11	5
2011	19	5668.17	13.99	4	5	1	2	1	7	8
2012	14	9970.86	11.17	5	6	3	2	4	8	7
2013	10	7624.80	8.39	4	4	4	3	0	13	2
2014	19	4644.82	10.37	5	7	8	5	0	17	6
2015	38	3813.14	9.53	17	11	1	1	0	13	21
2016	20	12210.08	19.79	3	7	4	3	0	17	7
2017	23	6672.47	10.49	4	11	0	2	0	21	6
2018	25	8979.13	12.18	5	14	0	0	0	0	4
Total	253			88	82	32	39	12	156	97

Table 2 Basic statistics

Panel A Basic statistics before matching

	treated				Others							
	mean	median	SD	N	mean	median	SD	N	t-test	ranksum test		
Employee(person)	1570.38	762.00	2399.22	253	1249.08	501.00	2255.18	27944	-2.25	**	-4.33	***
Employee squared(person)	8199601.21	580644.00	30469713.34	253	6645861.66	251001.00	28570123.92	27944	-0.86		-4.33	***
Employee Growth	0.00	0.00	0.07	253	0.01	0.00	0.07	25136	1.42		1.12	
Average annual wage(yen)	6324140.81	6261928.00	1236049.38	253	5925675.69	5828000.00	1289007.38	25293	-4.89	***	-5.84	***
Average employee age(year)	40.06	40.40	3.26	253	39.34	39.90	3.73	27943	-3.07	***	-2.79	***
Average tenure(year)	14.35	15.08	4.54	253	13.67	14.60	5.02	27942	-2.15	**	-2.08	**
Firm age(year)	61.20	63.00	22.95	253	56.85	60.00	22.24	24285	-3.10	***	-3.13	***
log(Tangible Fixed Assets)	77142777.31	20889384.00	172039468.37	253	66965937.55	9623998.00	211089018.59	28322	-0.76		-5.59	***
Sales(1,000yen)	234532403.34	93707000.00	489329191.86	253	185465554.64	38098610.00	486271780.53	28322	-1.60		-6.12	***
Segments	2.92	3.00	1.57	253	2.71	3.00	1.51	28322	-2.21	**	-2.22	**
log(Market value of shares)	10.76	10.79	1.57	253	9.86	9.60	1.74	25821	-8.24	***	-9.28	***
Tobin's Q	1.17	1.02	0.52	253	1.09	0.95	0.54	23745	-2.58	***	-4.29	***
Book-to-market ratio (PBR)	1.44	1.04	1.18	253	1.23	0.89	1.12	23753	-3.10	***	-4.71	***
Sales Growth(percent)	0.03	0.02	0.13	253	0.03	0.03	0.13	25469	0.81		0.60	
ROA(percent)	5.20	4.61	5.87	253	5.77	4.76	5.69	23817	1.58		1.11	
Debt ratio(percent)	0.46	0.44	0.22	253	0.51	0.52	0.20	28322	3.92	***	4.01	***
Cash and deposit ratio(percent)	0.19	0.17	0.12	253	0.17	0.14	0.13	28322	-2.62	***	-3.67	***
Dividends ratio(percent)	0.04	0.00	0.13	253	0.03	0.00	0.11	28322	-1.56		-2.09	**
Share buyback ratio(percent)	0.01	0.00	0.07	253	0.01	0.00	0.05	28322	-2.23	**	-2.07	**
Foreign ownership rate(percent)	15.29	13.92	12.90	253	7.25	2.65	10.05	23903	-12.61	***	-9.23	***

Table 2 Basic statistics**Panel B Basic statistics after matching**

	treated				control						
	mean	median	SD	N	mean	median	SD	N	t-test	ranksum test	
Employee(person)	1570.38	762.00	2399.22	253	1376.92	619.00	2066.27	245	-0.96	-1.50	
Employee squared(person)	8199601.21	580644.00	30469713.34	253	6147954.64	383161.00	20751075.89	245	-0.88	-1.50	
Employee Growth	0.00	0.00	0.07	253	0.01	0.01	0.07	245	1.22	1.80	*
Average annual wage(yen)	6324140.81	6261928.00	1236049.38	253	6483884.12	6388508.00	1423531.41	245	1.34	0.96	
Average employee age(year)	40.06	40.40	3.26	253	39.96	40.30	3.39	245	-0.34	-0.28	
Average tenure(year)	14.35	15.08	4.54	253	14.08	14.60	4.77	245	-0.65	-0.76	
Firm age(year)	61.20	63.00	22.95	253	61.11	63.00	23.17	245	-0.04	-0.35	
log(Tangible Fixed Assets)	77142777.31	20889384.00	172039468.37	253	70338790.07	19893568.00	143657053.35	245	-0.48	-0.01	
Sales(1,000yen)	234532403.34	93707000.00	489329191.86	253	211763155.82	63685668.00	396274624.61	245	-0.57	-0.77	
Segments	2.92	3.00	1.57	253	2.78	3.00	1.48	245	-0.97	-0.81	
log(Market value of shares)	10.76	10.79	1.57	253	10.84	10.80	1.68	245	0.49	0.09	
Tobin's Q	1.17	1.02	0.52	253	1.26	1.10	0.61	245	1.63	1.58	
Book-to-market ratio (PBR)	1.44	1.04	1.18	253	1.59	1.22	1.37	245	1.27	1.26	
Sales Growth(percent)	0.03	0.02	0.13	253	0.03	0.04	0.12	245	0.57	1.01	
ROA(percent)	5.20	4.61	5.87	253	5.89	5.01	5.23	245	1.38	1.77	*
Debt ratio(percent)	0.46	0.44	0.22	253	0.45	0.46	0.20	245	-0.31	0.01	
Cash and deposit ratio(percent)	0.19	0.17	0.12	253	0.19	0.16	0.13	245	-0.50	-1.19	
Dividends ratio(percent)	0.04	0.00	0.13	253	0.06	0.00	0.15	245	1.15	0.91	
Share buyback ratio(percent)	0.01	0.00	0.07	253	0.01	0.00	0.06	245	-0.18	0.34	
Foreign ownership rate(percent)	15.29	13.92	12.90	253	14.70	11.65	14.12	245	-0.49	-0.90	

Table 3 Change in employment and wages around investment by funds

Panel A Change in employment

Year		-3	-2	-1	0	1	2	3
Treated mean		1518.76	1561.57	1570.38	1568.49	1507.07	1525.81	1566.72
Control mean		1376.96	1379.69	1376.92	1385.06	1549.92	1669.95	1612.66
mean_differences		141.80	181.88	193.46	183.43	-42.84	-144.14	-45.94
t		-0.71	-0.92	-0.96	-0.91	0.20	0.61	0.18
obs		486	498	498	498	424	379	341

Table 3 Change in employment and wages around investment

Panel B Change in wages

Year		-3	-2	-1	0	1	2	3
Treated mean		6278914.30	6296591.00	6324140.80	6345398.10	6304151.20	6271588.00	6321647.80
Control mean		6325525.40	6405383.80	6483884.10	6534006.00	6589956.00	6620173.00	6524173.80
mean_differences		-46611.06	-108792.75	-159743.31	-188607.98	-285804.85	-348585.06	-202525.99
t		0.39	0.93	1.34	1.57	2.14**	2.44**	1.32
obs		479	493	498	498	424	379	341

Table 4 The effect of investment funds on employment and wages

	(1)		(2)		(3)		(4)	
VARIABLES	employee		wage		employee		wage	
Post	288.30	**	129904.00		230.20	***	174307.00	***
	(113.00)		(81593.00)		(71.34)		(66677.00)	
Investment	161.20		-93573.00		172.80		-105612.00	
	(218.90)		(131712.00)		(218.10)		(131380.00)	
Post × Investment	-226.80	**	-201132.00	**	-249.80	**	-176060.00	**
	(113.00)		(78562.00)		(111.70)		(81657.00)	
Constant	1512.00	***	6232000.00	***	1378.00	***	6406000.00	***
	-249.5		-149,851		-142.4		-96,941	
Year effect	Yes		Yes		No		No	
Observations	2,626		2,614		2,626		2,614	
R-squared	0.01		0.02		0.00		0.01	
Robust standard errors in parentheses								
*** p<0.01, ** p<0.05, * p<0.1								

Table 5 The effect of activist funds on employment and wages

VARIABLES	(3) employee		(4) wage		(5) employee		(6) wage	
Post	292.90 *** (112.90)		131652.00 (81581.00)		230.20 *** (71.37)		174307.00 (66703.00)	***
Activist	452.10 * (270.90)	*	45640.00 (136138.00)		446.70 (271.50)		45123.00 (135559.00)	
Post × Activist	-261.50 (154.30)	*	-217854.00 (89012.00)	**	-268.30 (153.40)	*	-206315.00 (93562.00)	**
Non-activist	-313.50 (246.00)		-320817.00 (187638.00)	*	-269.20 (242.00)		-348581.00 (187792.00)	*
Post × Non-activist	-111.50 (83.71)		-145800.00 (94066.00)		-166.60 (89.60)	*	-102246.00 (94751.00)	
Constant	1545.00 *** (249.00)	***	6246000.00 *** (150435.00)	***	1378.00 *** (142.50)	***	6406000.00 *** (96978.00)	***
Year effect	Yes		Yes		No		No	
Industry effect	No		No		No		No	
Prob > F	0.29		0.46		0.49		0.29	
Observations	2,626		2,614		2,626		2,614	
R-squared	0.02		0.03		0.01		0.02	
Robust standard errors in parentheses								
*** p<0.01, ** p<0.05, * p<0.1								

Table 6 The effect of country of origin of the investment funds

VARIABLES	(3) employee		(4) wage		(5) employee		(6) wage	
Post	264.30 (112.90)	**	120315.00 (82608.00)		230.20 (71.42)	***	174307.00 (66754.00)	***
USA fund	142.90 (312.30)		37870.00 (170782.00)		189.10 (304.10)		-10597.00 (166733.00)	
Post × USA fund	-215.00 (112.30)	*	-65664.00 (87012.00)		-244.50 (111.60)	**	-19676.00 (92449.00)	
GBR fund	1229.00 (477.80)	**	212778.00 (215140.00)		1270.00 (478.50)	***	178745.00 (217465.00)	
Post × GBR fund	-98.91 (160.40)		-189959.00 (104040.00)	*	-140.60 (158.60)		-176972.00 (108771.00)	
JPN fund	-571.50 (178.40)	***	-347589.00 (184049.00)	*	-604.90 (183.00)	***	-330039.00 (185431.00)	*
Post × JPN fund	-216.30 (90.73)	**	-465187.00 (117935.00)	***	-219.60 (88.94)	**	-435925.00 (119957.00)	***
Others	628.50 (563.60)		-151788.00 (245561.00)		612.00 (560.50)		-136222.00 (244779.00)	
Post × Others	-734.30 (386.50)	*	-255653.00 (138828.00)	*	-750.20 (384.20)	*	-229829.00 (141416.00)	
Constant	1507.00 (254.20)	***	6196000.00 (154179.00)	***	1378.00 (142.60)	***	6406000.00 (97053.00)	***
Year effect	Yes		Yes		No		No	
Industry effect	No		No		No		No	
Prob > F								
USA vs GBR	0.49		0.23		0.53		0.14	
USA vs JPN	0.99		0.00	***	0.81		0.00	***
USA vs SIN+other	0.18		0.16		0.19		0.13	
GBR vs JPN	0.46		0.00	**	0.60		0.05	**
GBR vs SIN+other	0.12		0.65		0.13		0.73	
JPN vs SIN+other	0.18		0.17		0.16		0.19	
Observations	2,626		2,614		2,626		2,614	
R-squared	0.047		0.042		0.043		0.025	
Robust standard errors in parentheses								
*** p<0.01, ** p<0.05, * p<0.1								

Table 7 Triple-difference model

Panel A The effect of excess employees

VARIABLES	(5) employee		(6) wage		(7) employee		(8) wage	
Post	94.37 (79.87)		205295.00 (109927.00)	*	81.45 (52.75)		258790.00 (98959.00)	***
Investment	23.50 (147.80)		-72103.00 (171326.00)		46.11 (143.10)		-99505.00 (170100.00)	
Post × Investment	-144.70 (86.40)	*	-264407.00 (116492.00)	**	-159.80 (82.60)	*	-248283.00 (120238.00)	**
Excess employee	1820.00 (324.50)	***	63543.00 (198263.00)		1858.00 (328.00)	***	23091.00 (195617.00)	
Post × Excess employee	135.30 (142.20)		-191140.00 (128647.00)		127.90 (135.90)		-205662.00 (131926.00)	
Investment × Excess employee	35.50 (458.90)		-59453.00 (259281.00)		-7.43 (460.00)		-17584.00 (257478.00)	
Post × Investment × Excess employ	-31.32 (212.50)		161831.00 (162461.00)		-20.87 (213.90)		177768.00 (167766.00)	
Constant	674.40 (215.80)	***	6204000.00 (175176.00)	***	700.30 (75.01)	***	6397000.00 (125889.00)	***
	Yes		Yes		No		No	
Observations	2,626		2,614		2,626		2,614	
R-squared	0.18		0.02		0.17		0.01	
Robust standard errors in parentheses								
*** p<0.01, ** p<0.05, * p<0.1								

Table 7 Triple-difference model

Panel B The effect of productivity

VARIABLES	(1) employee		(2) wage		(3) employee		(4) wage	
Post	281.40 (137.50)	**	87653.00 (85171.00)		226.10 (91.65)	**	161479.00 (74541.00)	**
Investment	-191.80 (271.60)		-287413.00 (146175.00)	**	-199.50 (271.90)		-280523.00 (145265.00)	*
Post × Investment	-293.00 (126.30)	**	-78175.00 (87791.00)		-296.20 (126.30)	**	-76275.00 (92154.00)	
Low productivity	-856.90 (213.90)	***	-1384000.00 (166232.00)	***	-886.80 (220.40)	***	-1348000.00 (161524.00)	***
Post × Low productivity	-86.34 (123.80)		19230.00 (118727.00)		-57.04 (115.20)		-38501.00 (119301.00)	
Investment × Low productivity	1079.00 (426.80)	**	720410.00 (245810.00)	***	1134.00 (425.10)	***	666196.00 (241902.00)	***
Post × Investment × Low productivity	254.60 (248.30)		-273941.00 (158313.00)	*	198.90 (235.60)		-203051.00 (161273.00)	
Constant	1754.00 (281.90)		6640000.00 (156795.00)		1660.00 (200.90)		6827000.00 (110877.00)	
	Yes		Yes		No		No	
Observations	2,626		2,614		2,626		2,614	
R-squared	0.03		0.17		0.02		0.15	
Robust standard errors in parentheses								
*** p<0.01, ** p<0.05, * p<0.1								