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# An Empirical Analysis of the Value Creation Mechanism of Private Equity Funds — Evidence from PE-Backed Companies in Japan —

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**Abstract:** In this paper, I analyze the post-buyout financial performance of companies acquired by PE funds in Japan between 2013 and 2015. The results reveal the following three points: (1) the existence of economic value of PE investment (e.g., value-up effects), (2) the possibility that management support through the network of the PE firm's parent company contributes to the improvement of performance, and (3) the possibility that PE investments with greater agency cost elimination effects achieve relatively better performance.

## 1. Introduction

Private equity investments have been used as a method of corporate restructuring since the late 1970s in the US and mid-1980s in the UK, and the market has expanded to date as a main asset for alternative investments, mainly by long-term investors such as pension funds. On the other hand, the PE market in Japan has only been in existence for a little over 20 years, since investing in companies by financial investors was practically prohibited in Japan until 1996. Despite the fact that Japan has the world's third largest economy, the Japanese PE market is currently only a few percent the size of the US market. However, in light of recent changes in the environment, such as growing demand for alternative investment under the negative interest rate environment in Japan, the worsening issue of business succession due to the aging of managers of owner companies, and the growing demand for business restructuring by large companies to improve their capital efficiency, the recognition and expectation of PE funds<sup>1</sup> in Japan has been increasing day by day. Against this backdrop, the Japanese PE market is expected to expand gradually going forward, but the track record of PE investments is still limited to date compared to the US and European markets, and there are very few prior academic studies analyzing the mechanisms and roles of PE funds. Therefore, for the future development of the market, it is important that such mechanisms and roles be clarified and recognized in industries and markets through further research on the academic side in addition to the accumulation of PE investments on the practical side. On the other hand, since PE investments are, in principle, investments in privately-held companies, it is significantly more difficult to obtain financial and other data on PE-backed companies than on listed ones. In this paper, I construct and analyze a data set from scratch, using not only Teikoku Databank's corporate profile information but also the websites and article searches of individual PE-backed companies. This paper is the very first study to analyze the mechanism of PE funds by measuring the post-buyout performance of PE-backed companies in Japan.

With regard to the structure of this paper, Chapter 2 surveys previous studies and systematizes the research themes and hypotheses. Chapter 3 formulates the hypotheses of this paper. Chapter 4 describes the research design and analytical methods. Chapter 5 summarizes the main empirical results and the interpretations suggested by the results. Chapter 6 concludes this research and lays out future challenges.

## 2. The Literature

### *2.1 Main hypotheses on economic value of PE investment*

There are four main hypotheses regarding the economic value of PE investment: (1) the free cash

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<sup>1</sup> The definition of PE fund in this report is an investment vehicle that raises funds mainly from outside investors, makes equity investments in multiple privately-held companies from a single fund, acquires more than the majority of shares of companies in principle, and then aims to achieve a return on investment that exceeds that of the publicly traded shares through value-added activities over the medium to long term.

flow hypothesis, (2) the agency cost reduction hypothesis, (3) the value transfer hypothesis, and (4) the value-up hypothesis.

In relation to hypothesis 1, Jensen (1986) shows that when a PE fund acquires a company, by conducting a leveraged buyout using debt in addition to its own equity investment, a PE-backed company will have to use the equivalent amount of cash flow from its business to repay debt after buyout. Such restriction discourages wasteful investments (investments with negative net present value) by management, and corporate value is enhanced. As for hypothesis 2, Jensen (1989) and Muscarella and Vetsuypens (1990) state that the design of pay-for-performance compensation for the management of PE-backed companies helps to align the interests of shareholders with those of management, which leads to more efficient business operations. In addition, the enhancement of governance systems by PE funds strengthens the monitoring of management and replaces low-performing managers, which significantly reduces agency costs between shareholders and management and increases corporate value. Regarding hypothesis 3, Lowenstein (1985) points out that wealth and economic value are transferred from stakeholders, such as employees, to shareholders through restructuring, such as reducing employment and compensation, after a PE fund acquires a company. For hypothesis 4, Meuleman *et al.* (2008) points out that a private equity firm that has a high level of knowledge of industries and markets contributes to corporate value enhancement through business growth by providing management support to PE-backed companies.

While the traditional agency theory-based approach is based on the hypothesis for improving profitability and efficiency mainly through cost reduction, such as concentration of business areas and controlling over-investment, the value-up hypothesis<sup>2</sup> suggests that, in addition to cost reduction, PE investment contributes to corporate value enhancement through business growth (top-line growth) and recent studies are more likely to suggest the importance of such value-up function of PE investments (Ayash *et al.* [2017]).

## ***2.2 Empirical research through analysis of financial performance of acquired companies***

Kaplan (1989) was the very first to demonstrate the economic value of PE investment through an empirical analysis of the actual financial performance of PE-backed companies. The study analyzes 48 privatization deals of listed companies acquired by PE funds between 1980 and 1986 and points out that the difference in performance change such as EBITDA/Assets and EBITDA/Sales from two years before to three years after the acquisition is statistically significant while comparing the change with that of control companies in the same sector. The research also points out that the difference in the amount of change in capital expenditures of PE-backed companies is significantly decreased compared to that of control firms. Scellato and Ughetto (2013) analyzes a total of 241 investments in

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<sup>2</sup> Meuleman *et al.* (2008) defines it as a “Strategic entrepreneurship perspective,” grounded in the resource-based view of the company.

European countries between 1997 and 2004 while classifying the types of PE firms into independent PE firms and corporate-affiliated PE firms.<sup>3</sup> They test the hypothesis that "PE-backed companies of independent PE firms are more profitable than those of corporate-affiliated PE firms," from the perspective that independent PE firms need to continuously raise successor funds from external investors because their funds are not contributed by their parent companies, and they need to achieve higher investment performance for sustainable fund management compared to that of corporate affiliated firms. But no significant results are identified in that paper. Meuleman *et al.* (2008) points out that large companies do not have appropriate governance systems and incentive designs for multiple subsidiaries and business units, and that the separation of ownership and management tends to lead to conflict of interest between shareholders and management. Furthermore, they suggest that PE investment leads to the resolution of these problems and increases corporate value. The study attempts to prove the hypothesis that "Divestitures of subsidiaries and business units of large companies achieves superior performance in terms of profitability, efficiency, and growth compared to other deal types," and obtains statistically significant results in terms of growth in the number of employees. The types of PE investments can be broadly categorized into the following (Table 1), and the analysis in this paper is conducted based on these types.

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<sup>3</sup> A PE firm whose parent company is a specific financial institution or business company.

**Table 1: Types of investment by PE fund**

| Types of Investments                                                               | Contents                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sale of subsidiaries and business units of large companies (Carve-out investments) | A parent company (a large corporation) divests its non-core businesses and concentrates its management resources. The divested subsidiary breaks free from the various constraints it has faced as a group company and implements growth strategies with the support of PE firms.                                                |
| Business succession for owner-operated companies                                   | A PE fund takes over the shares of small and medium-sized companies (privately held companies) in the event of business succession due to the aging of their owners. A PE firm aims to improve the corporate value through various management supports.                                                                          |
| Secondary buyout                                                                   | Stock transfer between financial investors. There are many cases where PE funds acquire shares of companies that are moving from the growth stage to the mature stage from VCs, or where shares are traded between PE funds with different investment strategies.                                                                |
| Business restructuring support                                                     | This is a type of deal in which a PE fund acquires an ailing company and aims to revitalize it through a variety of management supports. In many cases, only the best businesses of the underperforming company are selected.                                                                                                    |
| Going private of listed companies                                                  | A type of transaction in which the management team of a listed company, together with a PE fund, aims to take the company private through a management buyout. In many cases, conflicts of interest such as information asymmetry between the management team aiming to go private and the general shareholders become an issue. |

### 3. Hypotheses

With regard to the economic value of PE investment, this paper attempts to prove, using a sample of PE-backed companies in Japan, the effects of management support to PE-backed companies based on industry knowledge, know-how of management support, and networks of PE firms (value-up hypothesis), in addition to the traditional agency cost theory, which emphasizes the improvement of profitability and efficiency through the alignment of interests between shareholders and management. In other words, in addition to the aspect of whether PE-backed companies are consistently posting high profits through efficient business operations, I focus on whether PE-backed companies are achieving business growth (top-line growth) through the implementation of various growth strategies with the support of the PE firms after buyout.

#### Hypothesis 1:

**PE-backed companies achieve higher business growth and profitability than those of control companies.**

For investors (limited partners) who invest in PE funds, there are advantages and disadvantages in investing in either of the two types of funds. One of the advantages of funds managed by corporate-affiliated PE firms is that fund managers can use the name recognition and network of the parent company for sourcing deals, and the resources of the parent company can be used for post-buyout management support for value enhancement activities (Manigart *et al.* [2002]). On the other hand, the parent company often has the right to receive some portion of management fees and success fees

(carried interest), and such fees paid to fund managers are relatively lower than those of independent PE firms. Thus, the disadvantage of corporate-affiliated PE firms that they might not be able to provide sufficient incentives to their fund managers may cause talented managers to leave the company. In addition, the merits and demerits of independent PE firms are the opposite of those of corporate-affiliated PE firms. Based on the above, this paper attempts to prove the following hypothesis using a sample of PE-backed companies in Japan. In consideration of the fact that a certain percentage of management fees and carried interest are paid to the parent company outside Japan, and the similarity in the ability to provide management support (e.g., support for the overseas development of the PE-backed companies) utilizing the overseas network of the parent company, this paper treats foreign-affiliated firms as non-independent PE firms in the same way as corporate-affiliated PE firms.

#### **Hypothesis 2:**

**The performance of PE-backed companies of independent PE firms is better than that of corporate and foreign affiliated PE firms (and vice versa).**

In carve-out transactions of listed subsidiaries (sale of subsidiaries and business units of large companies), incentives such as stock options are provided to management to increase corporate value while aligning the interests of the fund as a shareholder with those of the company's management after buyout. On the other hand, in many cases, ownership and management of privately-held companies are basically aligned, and, in this sense, they do not have much of an agency problem to begin with, so even after a PE fund acquires a company, the impact of eliminating agency costs is minimal or limited. Therefore, corporate carve-out deals are expected to be superior than other types of deals in performance improvement after buyout (Meuleman *et al.* [2008]). Based on the above, I will attempt to test the following hypothesis using a sample of PE-backed companies in Japan.

#### **Hypothesis 3:**

**The performance of corporate carve-out deals is superior to that of PE-backed companies in other types of deals.**

## **4. Research Design**

### **4.1 Dataset**

As the first step, I use RECOF's M&A database to extract buyout investments in Japanese companies by PE funds that took place during the four-year period from April 2012 to March 2016 and compile a list in chronological order. The two reasons for selecting deals from this period are:

(1) the financial data of corporate information disclosed in Teikoku Databank is only for the most recent six fiscal years, and (2) at least four fiscal years of financial data (the period to be acquired and the subsequent three fiscal years after buyout) are required to measure the financial performance of PE-backed companies. Accordingly, transactions that meet these two criteria are those that were implemented between April 2012 and March 2016<sup>4</sup>. After sorting by the following three criteria: (1) "Buyout" as the form of share acquisition, (2) "Other Financial Institution" as the industry classification of the buyer, and 3) "In-In" or "Out-In" as type of M&A transaction, I exclude transactions where a buyer is not considered to be a PE fund, such as non-banks such as leasing companies, hedge funds and activist funds. In this analysis, I also exclude government-related entities such as Innovation Network Corporation of Japan (INCJ) because their roles and objectives are different from those of PE funds that are privately managed. Next, from *Japan Buy-out Market Review*, I extract buyout deals conducted between April 2012 and March 2016 from the list of major deals in each yearbook between the first half of 2012 and the first half of 2016 and compile a list of deals in chronological order. After integrating the list created based on RECOF's M&A database and the list created based on the *Japan Buy-out Market Review*, I combine the overlapping deals into one, and finally extract 151 buyout deals by PE funds.

In the second step, from the list of deals created in the first step, I narrow down the list to buyout investments acquired between March 2013 and April 2015 for which I can obtain financial data for the year to be acquired and the three years after buyout. I then access Teikoku Databank and download company profiles one by one. Then, while referring to the profiles, I manually enter information such as net sales, net income, shareholders' equity ratio, and year of establishment one by one to construct the dataset. Of the total 77 companies whose company profiles I downloaded, a total of 60 companies that had no defect in sales and net income for the three fiscal years after buyout were selected as the final samples for analysis.

As the third step, I select control firms using two criteria that have been widely used, including in previous studies: industry and size (sales). First, I identify "SPEEDA minor industry categories<sup>5</sup>" for PE-backed companies (60 companies in total) from the "Company Search" menu of SPEEDA which is a corporate database managed by Uzabase, Inc. Then, from the approximately 353,000 privately-held companies registered in the "Create Target List" menu of SPEEDA, I search for companies that belong to the same minor industry categories as the PE-backed companies and whose sales for the most recent fiscal year (e.g., sales for the fiscal year ended March 2019) differed from those of the

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<sup>4</sup> Although the period for which data analysis is possible is a little shorter, I intentionally set a longer period for the first step and extract all investments without omission.

<sup>5</sup> As of June 17, 2020, there were three levels of classification: major (19 categories), medium (83 categories), and minor (553 categories). For a PE-backed company for which SPEEDA industry classification data is not available, the SPEEDA industry category is inferred from the business category of the company in Teikoku Databank and business content on its website.

PE-backed companies within a range of  $\pm 50\%$ <sup>6</sup>. If there is a company which meets the criteria, it is selected as the control company (if there are multiple companies, the company with the closest sales to the PE-backed company is selected), and if there is no company which meets the criteria, one control company is selected for each PE-backed company from the SPEEDA industry medium category based on the same criteria (within  $\pm 50\%$  in sales). Finally, as control company Group A (private company group), 60 companies in total are selected. The background for the selection of private companies as the control companies is that, in principle, PE funds invest in private companies, which differ from listed companies in terms of governance mechanism and financing structure (private companies rely more on bank lending).

On the other hand, privately-held companies tend to suppress their net income by setting higher remuneration for their owners as a way to reduce tax, and this may have a certain impact on the analysis when setting the net income margin as the dependent variable. Therefore, to confirm the robustness of the results, this paper also analyzes another sample constructed with control companies, which are mainly listed companies (Control Group B, 114 companies in total<sup>7</sup>).

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<sup>6</sup> Since SPEEDA can only view the most recent sales figures of private companies (it is not possible to check any financial results for previous fiscal years when selecting control companies themselves in SPEEDA), after obtaining actual Teikoku Databank corporate information for the control companies selected by SPEEDA, sales for the first fiscal year after buyout (e.g., sales for the fiscal year ended March 2016) were not within  $\pm 50\%$  of the sales of PE-backed companies for 16 out of 60 control companies.

<sup>7</sup> Based on the sales of a PE-backed company's first fiscal year after buyout, two listed companies per one PE-backed company whose sales for the same period fell within  $+20\%$  or  $-20\%$  of the sales of the PE-backed companies were obtained from the SPEEDA industry minor category. If there was a company which met the criteria, that company was selected as the control company (if there were multiple companies, the company with the closest sales to the PE-backed company was selected), if there was no company which met the criteria, the company was selected from the SPEEDA industry medium category, and if there was no company in the medium category, the company was selected from the major category. As a result, a total of 114 companies were selected as control companies (112 listed companies and 2 private companies), including two cases in which there was no listed company which met the criteria (in which case, the two private companies selected in Control Group A were retained) and four cases in which there was only one listed company which met the criteria.

## 4.2 Definitions of variables used in the empirical analysis

**Table 2: Definitions of variables**

| Variables                    | Definitions                                                                                                |
|------------------------------|------------------------------------------------------------------------------------------------------------|
| <b>Dependent Variables</b>   |                                                                                                            |
| <i>Turnover Growth</i>       | Net sales in the third fiscal year divided by net sales in the first fiscal year after buyout              |
| <i>Mean Profitability</i>    | The average net income margin for the three fiscal years after buyout                                      |
| <i>Profitability_3</i>       | Net income margin in the third fiscal year after buyout                                                    |
| <b>Independent Variables</b> |                                                                                                            |
| <i>PE Backed Buyouts</i>     | Dummy variable taking 1 for PE-backed companies                                                            |
| <i>Independent</i>           | Dummy variable taking 1 for PE-backed companies of independent PE firms                                    |
| <i>Corporate/Foreign</i>     | Dummy variable taking 1 for PE-backed companies of corporate-affiliated firms and foreign-affiliated firms |
| <i>GP Age</i>                | Number of years from establishment of PE firm's first fund to time of buyout                               |
| <i>Carveout</i>              | Dummy variable taking 1 for carve-out deals of large companies                                             |
| <i>Business Succession</i>   | Dummy variable taking 1 for business succession deals (owner company deals)                                |
| <i>Secondary</i>             | Dummy variable taking 1 for deals among financial investors                                                |
| <i>Revival Support</i>       | Dummy variable taking 1 for turnaround type deals                                                          |
| <i>Going Private</i>         | Dummy variable taking 1 for privatization deals of listed companies                                        |
| <b>Control Variables</b>     |                                                                                                            |
| <i>ln Turnover_1</i>         | Logarithm of net sales in the first fiscal year after buyout                                               |
| <i>Profitability_1</i>       | Net income margin in the first fiscal year after buyout                                                    |
| <i>DE Ratio_1</i>            | DE ratio including accounts payable in the first fiscal year after buyout                                  |
| <i>Company Age</i>           | Number of years from year of establishment of company to buyout                                            |
| <i>TOPIX</i>                 | TOPIX index at time of buyout (as of end of the month)                                                     |

### **Dependent variables**

First, as an indicator of the long-term performance of PE-backed companies after buyout, this paper uses Turnover Growth as the main dependent variable. Turnover Growth has been widely used in previous studies such as Meuleman *et al.* (2008) and is appropriate as a variable to be used in this paper. The period to be analyzed is the three fiscal years after buyout (Cressy *et al.* [2007] and Meuleman *et al.* [2008]), which is an appropriate period considering that the typical investment period of PE funds is about 3-5 years and the main growth strategy is usually implemented about 1-3 years after buyout toward exit.

As for the variables of profit items, EBITDA/Sales and EBITDA/Assets are generally used because EBITDA is a well-established indicator to measure the cash flow generated by a company. These are mainly used to demonstrate the agency cost reduction hypothesis, which states that PE investment reduces wasteful investment and leads to more efficient business operations. In the case of Japanese companies, when a PE fund acquires a company, the difference between the acquisition price and net assets is newly recorded as goodwill on the balance sheet of PE-backed companies, and this goodwill

is amortized on a straight-line basis in SG&A over a period of up to 20 years<sup>8</sup>, hence use of EBITDA is appropriate for comparing the profit levels of PE-backed companies and control companies.

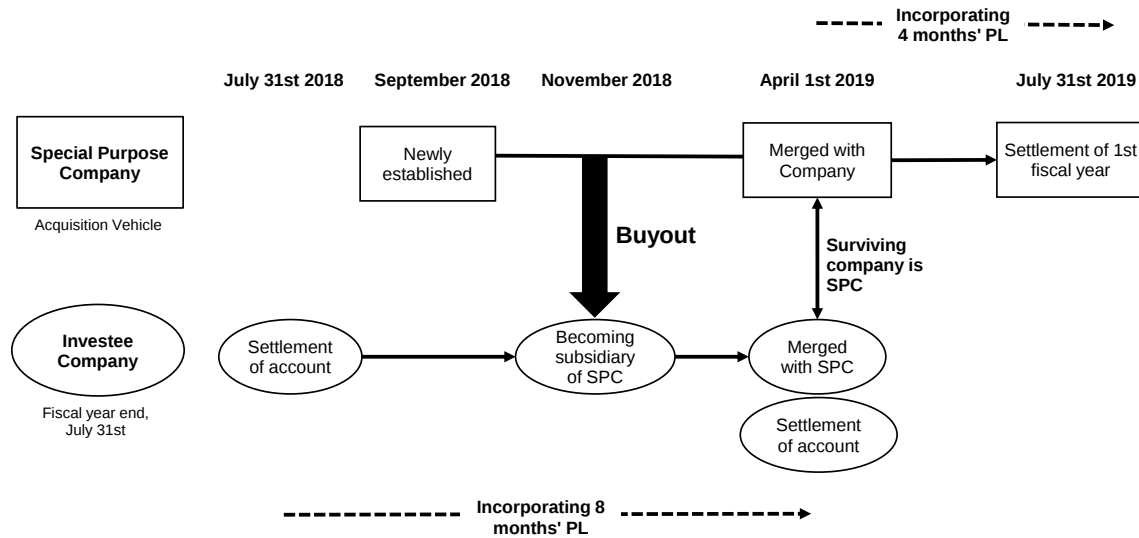
However, since the "Corporate Profile" of Teikoku Databank discloses only net income, in this paper, net income margin is used as the dependent variable, which impacts the amortization of goodwill to some extent. In other words, in Hypothesis 1, which is a comparative analysis of PE-backed companies and control companies, it is assumed that PE-backed companies are more affected by the amortization of goodwill than control companies, but I examine whether the net income margin is still significantly superior to that of control companies even after being affected by the amortization of goodwill. On the other hand, Hypothesis 2 and Hypothesis 3 analyze only 60 PE-backed companies (control companies are not included), and it is assumed that each is similarly affected by the amortization of goodwill, so it is not necessary to take the impact of the amortization of goodwill into account in the regression results.

It should be noted that this paper does not use the performance data for the fiscal year in which buyout took place ( $t=0$ ) because the performance data of PE-backed companies may be outliers. In general, when PE funds acquire a company, there are two types of methods: (1) a fund acquires shares directly from shareholders of a company, or (2) a fund establishes a special purpose company (SPC) as an acquisition vehicle and contributes equity to such SPC, then the SPC separately procures senior loans and/or mezzanine loans from banks and other financial institutions. Thereafter, the SPC purchases shares of companies while combining this equity and debt as an acquisition cost. In many cases, the second method is adopted because leveraged buyouts are made. When an SPC is used in a buyout scheme, it and the acquired company merge after the acquisition is completed. Subsequently, the profit and loss statement of the acquired company will be incorporated into the SPC (surviving company) from the date of merger.

If the merger between the SPC and acquired company is carried out in accordance with the acquired company's fiscal year end, no anomaly in performance data will be seen. On the other hand, timing of the merger might differ from the fiscal year end, for instance, eight months' profit and loss is recorded by the acquired company (absorbed company) and the remaining four months by the SPC (surviving company). Consequently, financial figures in Teikoku Databank may be lower than the actual situation even if the fiscal year end itself is the same as before buyout (see Figure 1). In fact, among the companies analyzed in this paper, there are some whose sales in Teikoku Databank for the period to be acquired ( $t=0$ ) are clearly lower than those for the periods before and after the buyout, and there are also some companies for which data is missing. Therefore, to ensure accuracy of the analysis, I decided not to use any financial data for the periods when the PE-backed companies are acquired in this paper.

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<sup>8</sup> Recently, an increasing number of PE-backed companies, mainly those aiming to exit by listing, have adopted International Financial Reporting Standards (IFRS) and do not amortize goodwill in a timely fashion. Nevertheless, the majority of PE-backed companies continue to apply Japanese GAAP.



**Figure 1: Impact of investment process on financial data of PE-backed companies**

The scheme of establishing SPCs for leveraged buyout is a standard process worldwide I assume, but there is no prior research that clearly mentions the possibility that this process affects the financial data of investee companies. It is assumed that the data providers used in prior studies incorporate financial data of investee companies into their dataset by making appropriate adjustments, but the actual situation is not clear. In this report, I check the levels of sales and net income for all PE-backed companies one by one for the three fiscal years after buyout, and carefully confirm that there are no irregular figures based on the abovementioned process.

### ***Independent variables***

The main independent variables for the hypotheses to be tested are all dummy variables except for GP Age (years of experience as PE firm), such as a dummy variable taking 1 for PE-backed companies. As for the classification of independent PE firms or corporate-affiliated PE firms, based on the website of each firm, PE firms in which domestic financial institutions are believed to hold the majority of shares are classified as corporate-affiliated PE firms, while others are classified as independent PE firms. Foreign-affiliated PE firms are Japanese subsidiaries of PE firms with global operations in investment activities. The types of investment are based on the five categories defined in *Japan Buy-out Market Review*, but for deals not listed in the *Review* (deals included only in the RECOF's M&A database), I check the website of each PE firm or refer to the press release of each deal to confirm the type of deal and then select the deal based on which type it most closely resembles.

**Table 3: Sample PE-backed companies by type of deal**

| Types of PE Firms | Number of Company | Types of Deals      | Number of Company |
|-------------------|-------------------|---------------------|-------------------|
| Independent       | 27                | Carveout            | 16                |
| Corporate         | 19                | Business Succession | 19                |
| Foreign           | 14                | Secondary           | 15                |
|                   |                   | Revival Support     | 7                 |
|                   |                   | Going Private       | 3                 |
| Total             | 60                | Total               | 60                |

**Independent variables (Control variables)**

Since the initial performance of the acquired company is an important factor for future performance (Cressy et al. [2007]), this paper uses the logarithm of sales in the first fiscal year after buyout ( $\ln \text{Turnover}_1$ ) and net income margin in the first fiscal year after buyout ( $\text{Profitability}_1$ ) as control variables. Since the gearing ratio is a particularly important factor affecting profits, this paper uses the DE ratio in the first fiscal year after buyout ( $\text{DE Ratio}_1$ ) as a control variable. Company Age is used as a control variable because PE-backed companies with a short business history have a high probability of bankruptcy, although they grow quickly (Cressy et al. [2007]). TOPIX is used as a control variable because it is an index that can control the impact on the Japanese stock market at time of buyout.

**4.3 Analytical methods**

Referring to Cressy *et al.* (2007), this paper analyzes (1) the economic value of PE investment, (2) impact of type of PE firms on a PE-backed company's performance, and (3) the impact of types of investments on PE-backed company performance, using multiple regression analysis with the least squares method. The dependent variables are variables such as Turnover Growth which indicates the long-term performance of sample companies, the independent variables are dummy variables such as PE-Backed Buyouts where the PE-backed companies are set as 1, and control variables are each financial figure immediately after buyout (in the first fiscal year), plus Company Age and TOPIX. The model to be analyzed is expressed in the following equation.

**Model Formula**

$$\text{Turnover Growth} = \alpha + \beta_1 \text{PE-Backed Buyouts} + \beta_2 \ln \text{Turnover}_1 + \beta_3 \text{Profitability}_1 + \beta_4 \text{DE Ratio}_1 + \beta_5 \text{Company Age} + \beta_6 \text{TOPIX} + \varepsilon$$

**5. Empirical Results****5.1 Descriptive statistics**

**Table 4: Descriptive statistics by PE-backed companies and control companies**

| Variable                   | Observations | Mean    | Median  | SD      | Min    | Max     |
|----------------------------|--------------|---------|---------|---------|--------|---------|
| <b>PE-backed Companies</b> |              |         |         |         |        |         |
| <i>Turnover_1</i>          | 60           | 20,672  | 9,676   | 55,628  | 547    | 430,833 |
| <i>ln Turnover_1</i>       | 60           | 3.915   | 3.986   | 0.566   | 2.738  | 5.634   |
| <i>Turnover Growth</i>     | 60           | 0.165   | 0.136   | 0.221   | -0.309 | 0.789   |
| <i>Profitability_1</i>     | 60           | 0.035   | 0.028   | 0.088   | -0.215 | 0.325   |
| <i>Profitability_3</i>     | 60           | 0.051   | 0.049   | 0.057   | -0.118 | 0.233   |
| <i>Mean Profitability</i>  | 60           | 0.046   | 0.039   | 0.059   | -0.085 | 0.181   |
| <i>DE Ratio_1</i>          | 58           | 2.662   | 2.125   | 2.283   | 0.136  | 11.500  |
| <i>Company Age</i>         | 60           | 41.500  | 39.000  | 31.010  | 4      | 146     |
| <i>Employees</i>           | 60           | 581.600 | 261.500 | 962.900 | 28     | 5,400   |
| <i>TOPIX</i>               | 60           | 1,310   | 1,278   | 149.600 | 1,035  | 1,593   |
| <b>Control Companies A</b> |              |         |         |         |        |         |
| <i>Turnover_1</i>          | 60           | 17,437  | 8,092   | 28,562  | 619    | 171,200 |
| <i>ln Turnover_1</i>       | 60           | 3.902   | 3.908   | 0.554   | 2.792  | 5.234   |
| <i>Turnover Growth</i>     | 60           | 0.069   | 0.022   | 0.212   | -0.310 | 0.970   |
| <i>Profitability_1</i>     | 60           | 0.028   | 0.025   | 0.077   | -0.254 | 0.230   |
| <i>Profitability_3</i>     | 60           | 0.033   | 0.028   | 0.057   | -0.133 | 0.276   |
| <i>Mean Profitability</i>  | 60           | 0.028   | 0.026   | 0.057   | -0.167 | 0.267   |
| <i>DE Ratio_1</i>          | 51           | 2.141   | 1.632   | 1.881   | 0.163  | 8.091   |
| <i>Company Age</i>         | 60           | 57.280  | 44.000  | 45.720  | 3      | 222     |
| <i>Employees</i>           | 60           | 296.200 | 235.000 | 254.000 | 13     | 1,100   |
| <i>TOPIX</i>               | 60           | 1,310   | 1,278   | 149.600 | 1,035  | 1,593   |
| <b>Control Companies B</b> |              |         |         |         |        |         |
| <i>Turnover_1</i>          | 114          | 21,525  | 10,649  | 55,905  | 672    | 447,774 |
| <i>ln Turnover_1</i>       | 114          | 3.952   | 4.027   | 0.543   | 2.827  | 5.651   |
| <i>Turnover Growth</i>     | 114          | 0.091   | 0.052   | 0.221   | -0.305 | 1.384   |
| <i>Profitability_1</i>     | 114          | 0.041   | 0.034   | 0.111   | -0.567 | 0.381   |
| <i>Profitability_3</i>     | 114          | 0.054   | 0.040   | 0.087   | -0.296 | 0.438   |
| <i>Mean Profitability</i>  | 114          | 0.045   | 0.034   | 0.085   | -0.316 | 0.413   |
| <i>DE Ratio_1</i>          | 113          | 1.804   | 0.800   | 3.472   | 0.100  | 20.700  |
| <i>Company Age</i>         | 114          | 48.010  | 50.500  | 23.400  | 5      | 113     |
| <i>Employees</i>           | 114          | 663.100 | 471.000 | 728.200 | 16     | 4,022   |
| <i>TOPIX</i>               | 114          | 1,307   | 1,278   | 148.800 | 1,035  | 1,593   |

Notes: 1. "Turnover\_1" is actual number in the first fiscal year after buyout.

2. "Employees" is number of employees in the Teikoku Databank corporate profile. This is not a variable used in the regression analysis in this paper, but is included for reference.

Table 4 shows descriptive statistics for PE-backed companies and control companies. Control companies are selected based on the criteria that the difference in sales to PE-backed companies for the most recent fiscal year is within the range of  $\pm 50\%$  (Control Group A). The average sales of 60 PE-backed companies are 20,672 million yen and that of 60 control companies 17,437 million yen in the first fiscal year after buyout, resulting in a difference of 3,235 million yen, or approximately 16%<sup>9</sup>.

As for the main dependent variable, the average of Turnover Growth for the two-year period from

<sup>9</sup> For Control Group B in the robustness check, average sales for the first fiscal year after buyout are 20,672 million yen for 60 PE-backed companies while 21,525 million yen for 114 control companies, a difference of 853 million yen, or about 4%.

the first to the third fiscal year after buyout is 16.5% for PE-backed companies, while the average for control companies is 6.9%. As for the Mean Profitability for the first three fiscal years after buyout, the average of PE-backed companies is 4.6%, while that of control companies is 2.8%.

As for other variables, the average business history at the time of buyout is 41.5 years for PE-backed companies, while the average for control companies is 57.3 years. Although the PE-backed companies have slightly shorter business histories, the business histories of sample companies are consistent with the general theories of PE investment where PE funds mainly target mature companies that generate stable cash flows. The average DE ratio\_1 (including accounts payable) in the first fiscal year after buyout is 2.7 times for PE-backed companies, compared to 2.1 times for control companies. This is consistent with the fact that leveraged buyout (LBO) schemes are used in a majority of PE investments.

## 5.2 Comparison of mean values (t-test)

**Table 5: Post buyout performance of PE-backed companies and control companies**

| Comparison with control companies Group A                    |                     |                   |        |         |
|--------------------------------------------------------------|---------------------|-------------------|--------|---------|
|                                                              | PE-backed Companies | Control Companies | t-test | p-value |
| Turnover Growth                                              | 0.165               | 0.069             | 2.425  | 0.017   |
| Mean Profitability                                           | 0.046               | 0.028             | 1.686  | 0.094   |
| Profitability_3                                              | 0.051               | 0.033             | 1.717  | 0.089   |
| Comparison with control companies Group B (Robustness Check) |                     |                   |        |         |
|                                                              | PE-backed Companies | Control Companies | t-test | p-value |
| Turnover Growth                                              | 0.165               | 0.091             | 2.108  | 0.037   |
| Mean Profitability                                           | 0.046               | 0.045             | 0.161  | 0.873   |
| Profitability_3                                              | 0.051               | 0.054             | 0.237  | 0.813   |

For Hypothesis 1 (demonstration of the economic value of PE investment), I conduct a comparative analysis of the post buyout performance of PE-backed companies and control companies based on the mean comparison test (t-test). First, a statistically significant difference (at the 5% level) is found for Turnover Growth from the first to third fiscal year after buyout (16.5% for PE-backed companies and 6.9% for control companies). In addition, in terms of the average net income margin for the three fiscal years after buyout (Mean Profitability) and also in the third fiscal year after buyout (Profitability\_3), PE-backed companies are 1.8% higher than control companies with a statistically significant difference (10% level)<sup>10</sup>.

<sup>10</sup> In the comparison with Control Group B for the robustness check, there is no significant difference in net income margin (average of three fiscal years after buyout and the third fiscal year after buyout). As aforementioned, use of EBITDA that takes into account impact of goodwill amortization is a remaining issue for future research.

### 5.3 Empirical results

#### (1) Economic value of PE investment

When Turnover Growth is the dependent variable, the empirical result shows that PE-backed companies achieve significantly higher growth of 9.3% compared to control companies (at the 5% level) (Table 6, Model I). This result suggests the existence of the so-called "value-up hypothesis" in which PE firms having market and industry knowledge contribute to top-line growth of their investees by utilizing their know-how and various management support networks.

**Table 6: Economic values of PE investment (Multiple regression analysis)**

| Variable          | Turnover Growth    |                      | Mean Profitability  |                     | Profitability_3     |                     |
|-------------------|--------------------|----------------------|---------------------|---------------------|---------------------|---------------------|
|                   | Control Samples A  | Control Samples B    | Control Samples A   | Control Samples B   | Control Samples A   | Control Samples B   |
|                   | I                  | II                   | III                 | IV                  | V                   | VI                  |
| PE Backed Buyouts | 0.093**<br>(0.041) | 0.064*<br>(0.034)    | 0.014*<br>(0.007)   | 0.006<br>(0.007)    | 0.011<br>(0.009)    | 0.001<br>(0.010)    |
| ln Turnover_1     | 0.023<br>(0.037)   | -0.021<br>(0.030)    | 0.007<br>(0.007)    | 0.001<br>(0.006)    | -0.003<br>(0.008)   | -0.007<br>(0.009)   |
| Profitability_1   | -0.309<br>(0.251)  | 0.037<br>(0.158)     | 0.515***<br>(0.045) | 0.604***<br>(0.033) | 0.414***<br>(0.054) | 0.482***<br>(0.045) |
| DE Ratio_1        | -0.009<br>(0.010)  | -0.009*<br>(0.005)   | 0.000<br>(0.002)    | -0.001<br>(0.001)   | 0.003<br>(0.002)    | -0.002<br>(0.002)   |
| Company Age       | -0.001<br>(0.001)  | -0.002***<br>(0.001) | 0.000<br>(0.000)    | 0.000<br>(0.000)    | 0.000<br>(0.000)    | 0.000<br>(0.000)    |
| TOPIX             | 0.000<br>(0.000)   | 0.000<br>(0.000)     | 0.000<br>(0.000)    | 0.000<br>(0.000)    | 0.000<br>(0.000)    | 0.000<br>(0.000)    |
| Constant          | 0.222<br>(0.229)   | 0.299<br>(0.190)     | 0.020<br>(0.041)    | 0.040<br>(0.040)    | 0.033<br>(0.050)    | 0.101*<br>(0.054)   |
| Observations      | 120                | 174                  | 120                 | 174                 | 120                 | 174                 |
| R-squared         | 0.086              | 0.137                | 0.577               | 0.674               | 0.372               | 0.423               |

Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Furthermore, when the net income margin (average of the first three fiscal years after buyout) is used as the dependent variable, the empirical result shows that PE-backed companies achieve significantly higher profit margins (at the 10% level) than that of control companies (Table 6, Model III)<sup>11</sup>. This empirical result suggests that the economic value of PE investment, such as improved profitability and efficiency based on agency theory, is realized in PE-backed companies in Japan, as in previous studies analyzing European and US investees.

#### (2) Impact of types of PE firms on PE-backed company performance

When the dependent variable is the net income margin (average of three fiscal years after

<sup>11</sup> In the analysis using the control samples B for the robustness check, the result is significant at the 10% level when the dependent variable is Turnover Growth (Table 6 Model II), while the result is not significant when the dependent variable is net income margin (average of three fiscal years after buyout) (Table 2, Model IV).

buyout), the result suggests that the investees of corporate-affiliated PE firms and foreign-affiliated PE firms post a better net income margin (at the 10% level) than the investees of independent PE firms (Table 7, Model VI). This suggests that corporate-affiliated PE firms and foreign-affiliated PE firms contribute to increasing the value of their investees through management support utilizing the network of parent companies. In addition, the activity of PE funds is not widely recognized since the Japanese PE market is still far smaller than European and US counterparts—a parent company's name and recognition is believed to be an advantage for PE firms when approaching good companies with high profitability. On the other hand, no significant result is identified when the dependent variable is Turnover Growth (Table 7, Model II).

**Table 7: Impact of type of PE firm on PE-backed company performance  
(Multiple regression analysis)**

| Variable          | Turnover Growth   |                   | Mean Profitability  |                     |                    |                   |
|-------------------|-------------------|-------------------|---------------------|---------------------|--------------------|-------------------|
|                   | I                 | II                | III                 | IV                  | V                  | VI                |
| Independent       | -0.021<br>(0.061) |                   | -0.015<br>(0.012)   |                     | -0.028*<br>(0.016) |                   |
| Corporate/Foreign |                   | 0.021<br>(0.061)  |                     | 0.015<br>(0.012)    |                    | 0.028*<br>(0.016) |
| GP Age            | 0.003<br>(0.008)  | 0.003<br>(0.008)  | 0.000<br>(0.002)    | 0.000<br>(0.002)    | 0.000<br>(0.002)   | 0.000<br>(0.002)  |
| ln Turnover_1     | 0.032<br>(0.057)  | 0.032<br>(0.057)  | -0.002<br>(0.011)   | -0.002<br>(0.011)   | -0.007<br>(0.015)  | -0.007<br>(0.015) |
| Profitability_1   | 0.191<br>(0.351)  | 0.191<br>(0.351)  | 0.414***<br>(0.071) | 0.414***<br>(0.071) |                    |                   |
| DE Ratio_1        | -0.009<br>(0.014) | -0.009<br>(0.014) | -0.001<br>(0.003)   | -0.001<br>(0.003)   | -0.002<br>(0.004)  | -0.002<br>(0.004) |
| Company Age       | -0.001<br>(0.001) | -0.001<br>(0.001) | 0.000<br>(0.000)    | 0.000<br>(0.000)    | 0.000<br>(0.000)   | 0.000<br>(0.000)  |
| TOPIX             | 0.000<br>(0.000)  | 0.000<br>(0.000)  | 0.000<br>(0.000)    | 0.000<br>(0.000)    | 0.000<br>(0.000)   | 0.000<br>(0.000)  |
| Constant          | 0.213<br>(0.391)  | 0.192<br>(0.384)  | 0.109<br>(0.079)    | 0.093<br>(0.078)    | 0.165<br>(0.100)   | 0.138<br>(0.099)  |
| Observations      | 60                | 60                | 60                  | 60                  | 60                 | 60                |
| R-squared         | 0.062             | 0.062             | 0.453               | 0.453               | 0.095              | 0.095             |

Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Note: The regression results with net income margin in the third fiscal year after buyout (Profitability\_3) as the dependent variable are the same as those for Mean Profitability, and are therefore omitted for reasons of space.

### (3) Impact of type of investment on PE-backed company performance

In the case where the dependent variable is Turnover Growth, the empirical result shows that corporate carve-out deals achieve significantly higher growth than other types of deals by 16% (at the 5% level) (Table 8, Model I). This is consistent with the empirical results of Meuleman *et al.* (2008) which finds that corporate carve-out deals, in which ownership and management are clearly separated, evidence the relatively large impact of PE investment on eliminating agency cost.

**Table 8: Impact of type of investment on PE-backed company performance  
(Turnover Growth / Multiple regression analysis)**

| Variable            | Turnover Growth    |                   |                  |                    |                  |
|---------------------|--------------------|-------------------|------------------|--------------------|------------------|
|                     | I                  | II                | III              | IV                 | V                |
| Carveout            | 0.160**<br>(0.067) |                   |                  |                    |                  |
| Business Succession |                    | -0.095<br>(0.065) |                  |                    |                  |
| Secondary           |                    |                   | 0.025<br>(0.079) |                    |                  |
| Revival Support     |                    |                   |                  | -0.161*<br>(0.096) |                  |
| Going Private       |                    |                   |                  |                    | 0.071<br>(0.139) |
| GP Age              | 0.001<br>(0.008)   | 0.005<br>(0.008)  | 0.004<br>(0.009) | 0.003<br>(0.008)   | 0.004<br>(0.008) |
| Constant            | 0.198<br>(0.366)   | 0.232<br>(0.378)  | 0.188<br>(0.384) | 0.225<br>(0.375)   | 0.194<br>(0.384) |
| Observations        | 60                 | 60                | 60               | 60                 | 60               |
| R-squared           | 0.152              | 0.096             | 0.062            | 0.108              | 0.065            |

Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Note: The five control variables are omitted from the table for reasons of space.

On the other hand, when the dependent variable is the net income margin (average of three fiscal years after buyout), the coefficient is positive, but the result is not significant (Table 9, Model I). In other words, although corporate carve-out deals achieve top-line growth, profit level is not significantly better than that of other types of deals.

**Table 9: Impact of type of investment on PE-backed company performance**  
**(Average of net income margin for the three fiscal years after buyout / Multiple regression analysis)**

| Variable            | Mean Profitability |                   |                   |                    |                    |
|---------------------|--------------------|-------------------|-------------------|--------------------|--------------------|
|                     | I                  | II                | III               | IV                 | V                  |
| Carveout            | 0.016<br>(0.014)   |                   |                   |                    |                    |
| Business Succession |                    | -0.008<br>(0.014) |                   |                    |                    |
| Secondary           |                    |                   | -0.010<br>(0.016) |                    |                    |
| Revival Support     |                    |                   |                   | -0.034*<br>(0.020) |                    |
| Going Private       |                    |                   |                   |                    | 0.063**<br>(0.027) |
| GP Age              | 0.000<br>(0.002)   | 0.000<br>(0.002)  | 0.000<br>(0.002)  | 0.000<br>(0.002)   | 0.000<br>(0.002)   |
| Constant            | 0.092<br>(0.078)   | 0.094<br>(0.079)  | 0.091<br>(0.079)  | 0.098<br>(0.077)   | 0.096<br>(0.075)   |
| Observations        | 60                 | 60                | 60                | 60                 | 60                 |
| R-squared           | 0.45               | 0.44              | 0.441             | 0.467              | 0.489              |

Standard errors in parentheses. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Notes: 1. The regression results with net income margin in the third fiscal year after buyout (Profitability\_3) as the dependent variable are the same as those for Mean Profitability, and are therefore omitted for reasons of space.

2. The five control variables are omitted from the table for reasons of space.

## 6. Conclusion

This paper analyzes the post buyout long-term performance of PE-backed companies (privately-held companies) in Japan, which have not been studied in comparison with European and US investees, to clarify the intrinsic value creation mechanism of PE investment. I also analyze how the types of PE firms and types of investment affect the performance of investees.

First, I demonstrate that PE-backed companies achieve higher business growth than control companies (non-buyout companies). In other words, in addition to a PE firm's ability to search for and select mature companies with high growth potential, the study demonstrates the existence of a "value-up effect" in which industry knowledge, know-how, and networks of PE firms contribute to the improvement of corporate value of PE-backed companies. The study also demonstrates that PE-backed companies achieve a higher profit margin (average of net income margin for the three fiscal years after buyout) than control companies. As in previous studies analyzing European and US investees, this suggests the existence of economic value of PE investment in Japanese companies, such as improved profitability and efficiency based on agency theory. Second, I demonstrate that the investees of corporate-affiliated PE firms and foreign-affiliated PE firms post higher profit margins than investees of independent PE firms. In a developing market like Japan, since there is a lack of awareness of the existence of PE funds and their activities, management support utilizing resources

and networks of parent companies is believed to contribute to performance of PE-backed companies. Also, parent company name recognition may be a factor in approaching companies with superior profitability. Third, the study demonstrates that curve-out deals of large companies achieve higher business growth than other types of deals. This result indicates that investments that have a greater effect on eliminating agency costs can achieve relatively higher performance among PE investments.

In future research, in addition to accumulating multifaceted financial data on privately-held companies in Japan, it will be necessary to build a database specializing in PE funds and their investments. This will require the comprehensive collection and accumulation of data on all PE investments from early days of the Japanese PE market to the present through the cooperation of private data providers and industry where PE firms and institutional investors voluntarily provide data on PE investments. The development of a database dedicated to PE funds and their investments will enable precise academic research, and through the development of theories, the mechanism of PE investment will become clearer, which will have a significant positive effect for participants in the Japanese PE market.

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