
Impact of the Using Non-Regular Employees on On-the-Job Training* —From Both Viewpoints of Companies and Workers

Hiroki Yasuda

Keio University

Based on previous studies which clarified that employment of non-regular employees has a negative impact on firm-level training, this paper verified whether it is caused by quantitative change in non-regular employees or functional problems such as employment policy of non-regular employees. As a result of the analysis, it was confirmed that quantitative increase in non-regular employees is not a major impediment to implementation of On-the-Job Training (OJT). On the other hand, it was confirmed that OJT does not function smoothly in companies where the number of regular employees' employment is reduced by the employment of non-regular employees. This indicates that OJT is not functioning smoothly in companies in which regular employees have been replaced with non-regular ones. It indicated a possibility that the impact of employment of non-regular employees on OJT is caused by a functional problem of human resources management, i.e., using non-regular employees as substitutes for regular employees, not quantitative change in non-regular employees.

I. Introduction

The purpose of this paper, based on previous studies which clarified that employment of non-regular employees has a negative impact on firm-level training, is to verify whether it is caused by quantitative change in non-regular employees or functional problems such as employment policy of non-regular employees.

The recent main characteristic of Japanese companies' human resources management is that non-regular employees have been actively used.¹ Japanese companies have promoted the use of non-regular employees aimed mainly at decrease in labor cost and change labor cost into variable cost due to long-term recession following the burst of the bubble economy.² Non-regular employees have been in charge of core tasks similar to regular employees.

Such business behavior may have a positive impact on the companies such as boost-

* This paper is a revised and expanded version of Yasuda (2008), which was published by *Journal of Ohara Institute for Social Research*. I gratefully acknowledge helpful comments and suggestions from Souichi Ohta (Faculty of Economics, Keio University). I am also grateful for the helpful comments of the referees and committee of *Journal of Ohara Institute for Social Research*. Needless to say, all remaining errors are my own responsibility.

¹ According to OECD (2008), Japan's ratio of part-time workers (working time is less than 30 hours per week) in 2007 was 18.9% (male: 9.2%, female: 32.6%), above the OECD average for both male and female, and is at high level internationally.

² Toyoda (2005) verified that the employment of non-regular employees has progressed in wholesale, retail and restaurant industries in which there is a substantial wage gap between regular and non-regular employees and non-regular employees function as a buffer of employment.

ing company profits in the short term. However, in the middle and long term, there is fear that it causes an impediment to handing down of skills and a decrease in human capital level and has a negative impact on business management in the future. Especially this problem is important when considering vocational training for youth who can obtain technologies and skills most effectively (Ohta 2006).

In fact, studies on a negative impact of the use of non-regular employees on firm-level training mainly at production sites of the manufacturing industry have been accumulated.

Kimura (2002) pointed out that problems such as “difficulty of training new regular employees” and “impediment to original work” have been caused by growing share of non-regular employees and outside personnel at production and engineering sites and it has a negative impact on human resources development.

Sato, Sano and Kimura (2003) pointed out big issues posed by the use of contract company workers at production sites such as “increase in burden on regular employees who provide education and training to contract company workers,” “difficulty of accumulation and handing down of know-how” and “increase in burden on regular employees who assume operational control over contract company workers.”

Muramatsu (2004) conducted a hearing survey for production sites of Toyota Motors group companies and pointed out that it has been difficult to accumulate technologies and skills due to too many displaced non-regular employees and the ability to improve work environment has decreased. However, even at a workplace with high ratio of non-regular employees, smooth production can be done if the company provides vocational training to non-regular employees on a rotating basis the same as regular employees and opens the door for non-regular employees to become regular employees.

This paper verifies whether such negative impact of using non-regular employees on firm-level training is caused by quantitative increase in non-regular employees or functional problems such as use policy and work contents of non-regular employees. Especially the impact of using non-regular employees on firm-level training is analyzed by using both data of companies and workers.

There are following three major characteristics of this analysis:

Firstly, the analysis focuses on On-the-Job Training (“practical training on the job,” hereinafter referred to as OJT) in firm-level training. The vocational training is classified broadly into OJT, Off-the-Job Training (“training off the job,” hereinafter referred to as Off-JT) and self-development and a special emphasis has been placed on OJT for skill development and promotion in rank and grade (Koike 2005).

In considering the impact of using non-regular employees on firm-level training, it is necessary to examine if OJT functions smoothly at workplace in which employees with different employment patterns such as responsibility for job and evaluation/treatment system are mixed. However, many of previous studies on non-regular employees focused on transfer from non-regular employees to regular ones (Blank 1998; Faber 1999; Chalmers

and Kalb 2001; Booth, Francesconi and Frank 2002; O'Reilly and Bothfeld 2002; Gash 2008; Picchio 2008; Aizawa and Yamada 2008; Genda 2008, 2009) and training disparity between non-regular and regular employees (Arulampalam and Booth 1998; Kawaguchi 2006; Sano 2007; Kurosawa and Hara 2009), and there are not many studies focusing on the impact of using non-regular employees in workplaces and companies.³

Therefore, this paper analyzes the relationship between use of non-regular employees and OJT focusing on OJT among firm-level training. Unless otherwise noted, "firm-level training," "vocational training" and "training" shall mean OJT hereafter.

Secondly, this paper analyzes various industries while previous studies mainly analyzed manufacturing industry. Given current human resources management of companies, the use of non-regular employees has progressed as a pillar of human resources management in not only manufacturing industry centered on production sites but also offices. Therefore, this paper also analyzes the impact of using non-regular employees on firm-level training in non-manufacturing industries.

Thirdly, this paper analyzes the impact of using non-regular employees on firm-level training from many directions by using both data of companies and workers. That is, the relationship between the use of non-regular employees and firm-level training from the viewpoint of subjects providing vocational training can be analyzed by using companies' data and those from the viewpoint of objects receiving vocational training can be analyzed by using workers' data. It would be highly meaningful to analyze using both data of companies and workers.

In considering current human resources management of Japanese companies, although it should be essential to consider the impact of using non-regular employees on firm-level training, it has been ill-argued. Therefore, detailed analysis on the impact of using non-regular employees on firm-level training would provide significant information for the consideration of the progress of using non-regular employees as a human resources management in the future.

This paper consists of the following. Issues to be considered will be discussed in Section II, data used for the analysis will be introduced in Section III, the impact of using non-regular employees on workplaces and companies will be outlined in Section IV, Regression analyzes will be conducted in Section V and VI and finally findings obtained by this analysis will be confirmed in Section VII.

II. Issues to Be Considered

This paper mainly discusses the following three issues to be considered:

Firstly, the impact of quantitative increase in non-regular employees at workplaces on

³ Ariga, Kambayashi and Sano (2008) analyzed the impact of policy regarding the use of non-regular employees and human resources management on the job retention rate of non-regular employees.

firm-level training is discussed. According to analysis results of Kimura (2002) and Sato, Sano and Kimura (2003), the quantitative increase in non-regular employees may disturb firm-level training through increase in the amount of time regular employees spend on education and guidance for non-regular employees. Therefore, the impact of quantitative increase in non-regular employees on firm-level training is discussed.

Secondly, the impact of quantitative decrease in regular employees at workplaces on firm-level training is discussed. The decrease in regular employees at workplaces may have the impact on firm-level training as well as the increase in non-regular employees. Regular employees centered on youth are forced to work long hours due to curbing new hires and restructuring promotion caused by the *Heisei Recession* (Genda 2005 and Ogura 2007). Therefore, the decrease in regular employees may disturb firm-level training through increase in working hours of regular employees.⁴ That is why the impact of quantitative decrease in regular employees at workplaces on firm-level training is discussed.

Thirdly, the impact of policy regarding the use of non-regular employees on firm-level training is discussed. It would appear that what jobs and tasks non-regular employees are used for have a significant impact on firm-level training. Non-regular employees have been core workforce recently, but it has not been considered whether non-regular employees being in charge of core tasks similar to regular employees have a positive or negative impact on firm-level training. Therefore, the impact of non-regular employees who become core taskforce on firm-level training is discussed.

III. Data

Data used in this paper are micro data from “Survey on Companies’ Personnel Strategies and Workers’ Attitude toward Work 2003” conducted in January 2003 by the Japan Institute of Labour (currently, the Japan Institute for Labour Policy and Training [JILPT]. Hereinafter referred to as JIL Survey).⁵

Although JIL Survey consists of company survey and worker survey, this paper uses both data and considers the impact of using non-regular employees on firm-level training from both viewpoints of employers and employees.

In the company survey, 10,000 companies with 100 or more employees were extracted from the database of enterprises with 30 or more employees owned by the Nikkei Research Inc. and survey slips were distributed to those companies. The number of effective

⁴ Cappelli (1999) analyzed the impact of restructuring in U.S. companies and indicated that although the productivity has been improved, the workload has increased and organizational climate/morals and employees’ commitment have been corrupted.

⁵ In preparing this paper, micro data of “Survey on Companies’ Personnel Strategies and Workers’ Attitude toward Work 2003” (JILPT) was provided by the Social Science Japan Data Archive, Information Center for Social Science Research on Japan, Institute of Social Science, the University of Tokyo. I would like to express my gratitude to them.

answers collected from the companies was 1,602 (collection rate: 16.02%).⁶

In the worker survey, 10 each of survey slips were sent to 5,000 establishments with 10 or more employees extracted from an enterprise summary database “COSMOS2” owned by the Teikoku Databank Ltd. to ask distribute those slips to their employees (50,000 persons in total). The number of effective answers collected was 7,566 (collection rate: about 15.13%).

A striking advantage of using this JIL Survey data is that both company and worker surveys were made on “the impact caused by using non-regular employees” with 10 question items. Since there are few data with explicit questions on the impact of using non-regular employees, these data are invaluable. The detailed analysis on how the use of non-regular employees impacts on workplaces and companies can be done by using these questions and answers.

Furthermore, since the company survey is different from the worker survey, if consistent analysis results are obtained from data of companies and workers, more persuasive conclusions on the impact of using non-regular employees on firm-level training can be achieved. That is another advantage of using JIL Survey results.

However, due to different sampling, data of companies cannot be analyzed with data of workers, and both companies’ and workers’ awareness of using non-regular employees cannot be perceived completely. This is the limit of using JIL Survey results.

IV. Impact Caused by Using Non-Regular Employees

In this section, the impact caused by using non-regular employees is reviewed by using both company and worker surveys of JIL Survey.

Firstly, the impact of using non-regular employees on companies is considered using the company survey. The company survey slip says, “Please answer the following questions A to J about the impact caused by the use of non-regular employees. Please check the appropriate number.” and demands answers for 10 question items.

Table 1 summarizes the answers for these 10 questions.

Focusing attention on positive variables of D.I., “Regular employees can apply themselves to advanced business” (37.11), “Labor productivity is improved” (30.07) and “Working together smoothly” (14.66) show great positive values and these are the positive impact caused by the use of non-regular employees from the view point of employers. On the surface, regular employees can apply themselves to advanced business, labor productivity is improved and they are working together smoothly, so it seems to be free of problems.

However, focusing attention on negative variables of D.I., “Know-how is accumulated/handed

⁶ At the stage of sampling, companies with 100 or more employees should have been extracted, but companies with less than 100 employees were included in the sample (66 companies, about 4.12% of the total). It is thought that this happened due to the slight difference between data owned by the Nikkei Research Inc. and actual number of employees in companies at the time of the survey.

Table 1. Impact Caused by the Use of Non-Regular Employees (%) (Company Survey, N=1460)

[A]	I	II	III	IV	V	N.A	D.I	[B]
Know-how is accumulated/handed down	2.12	14.66	50.62	20.82	4.18	7.60	-8.22	Hard to accumulate/hand down know-how
Easy to conduct vocational training	0.62	8.77	64.73	15.41	1.92	8.56	-7.94	Hard to conduct vocational training
No risk of leaking secrets to outside	5.68	14.93	46.85	22.12	3.08	7.33	-4.59	At risk of leaking secrets to outside
New know-how is introduced from outside	2.33	12.88	62.74	10.00	3.63	8.42	1.58	Hard to introduce know-how from outside
Quality of products/service is improved	2.12	16.37	61.64	10.75	0.62	8.49	7.12	Quality of products/service is reduced
Regular employees' morale is raised	1.51	16.78	67.67	6.71	0.48	6.85	11.10	Regular employees' morale is degraded
Regular employees' working hours become shorter	2.53	19.18	62.05	8.01	1.78	6.44	11.92	Regular employees' working hours become longer
Working together smoothly	2.95	23.84	54.45	11.58	0.55	6.64	14.66	Not working together smoothly
Labor productivity is improved	3.49	33.63	49.38	6.71	0.34	6.44	30.07	Labor productivity is declined
Regular employees can apply themselves to advanced tasks	5.75	38.01	43.15	5.62	1.03	6.44	37.11	Regular employees cannot apply themselves to their original tasks

Note: I: Close to A, II: Closer to A than B, III: Neither, IV: Closer to B than A, V: Close to B. D.I is an abbreviation for Diffusion Index. It is obtained by the formula: $(I+II) - (IV+V)$. Items are arranged in ascending order of D.I.

down” (-8.22), “Easy to conduct vocational training” (-7.94) and “No risk of leaking secrets to outside” (-4.59) show negative values. That is, “Hard to accumulate/hand down know-how,” “Hard to conduct vocational training” and “At risk of leaking secrets to outside” are the negative impact caused by the use of non-regular employees from the viewpoint of employers.

Based on both positive and negative impacts caused by the use of non-regular employees, the impact caused by the use of non-regular employees can be considered as follows:

In the short term, regular employees can apply themselves to advanced business, labor productivity is improved, they are working together smoothly and benefits are more than costs so the use of non-regular employees have a great positive impact on companies even though there are problems with accumulation/handing down of know-how and vocational training.

However, the problems with accumulation/handing down of know-how and vocational training as the negative impact are highly unlikely to become obvious in the short term. Therefore, in the middle and long term, such problems become obvious and costs may be more than benefits.

In other words, if companies put the use of non-regular employees into short-term perspective only, it brings about a decrease in human capital level of employees due to problems with accumulation/handing down of know-how and impediment to vocational training in the middle and long term and may have a negative impact on business management in the future. As Kimura (2002) and Muramatsu (2004) pointed out in their previous studies, the true nature of the problems with the use of non-regular employees is a question that has bearings on the fundamental character of human resources development such as accumulation/handing down of know-how and vocational training.

Next, the impact of using non-regular employees on workplaces and companies is considered using the worker survey.

The worker survey slip says, the expression is slightly different from the company survey slip, “Please answer the following questions A to J about the situations seen when regular and non-regular employees are working together. Please check the appropriate number.” and demands answers for 10 question items as same as the company survey slip.

Table 2 summarizes the answers for these 10 questions.

Focusing attention on positive variables of D.I., “Regular employees can apply themselves to advanced business” (30.77), “Working together smoothly” (13.34) and “Labor productivity is improved” (12.66) show great positive values. These top three items agree with the result of the company survey. It turns out that employers and employees share common perceptions on the positive impact caused by the use of non-regular employees.

On the other hand, focusing attention on negative variables of D.I., “Regular employees’ working hours become shorter” (-14.25), “Easy to conduct vocational training” (-7.89) and “Know-how is accumulated/handed down” (-7.32) show negative values. These

Table 2. Situations Seen When Regular and Non-Regular Employees Are Working Together (Worker Survey, N=3906)

	[A]	I	II	III	IV	V	N.A	D.I	[B]
Regular employees' working hours become shorter	3.48	20.25	58.19	11.55	3.71	2.82	8.47	Regular employees' working hours become longer	
Easy to conduct vocational training	2.10	10.52	63.95	15.31	5.20	2.92	-7.89	Hard to conduct vocational training	
Know-how is accumulated/handed down	2.87	11.78	54.61	16.41	12.49	1.84	-14.25	Hard to accumulate/hand down know-how	
New know-how is introduced from outside	2.59	13.80	59.47	14.21	7.30	2.64	-5.12	Hard to introduce know-how from outside	
Regular employees' morale is raised	8.58	17.18	45.44	19.74	6.61	2.46	-0.59	Regular employees' morale is degraded	
No risk of leaking secrets to outside	2.82	17.31	49.54	19.87	7.58	2.89	-7.32	At risk of leaking secrets to outside	
Quality of products/service is improved	2.53	15.72	58.99	14.64	5.53	2.59	-1.92	Quality of products/service is reduced	
Labor productivity is improved	5.56	27.93	43.93	15.59	4.56	2.43	13.34	Labor productivity is declined	
Working together smoothly	3.41	24.30	54.48	11.47	3.58	2.76	12.66	Not working together smoothly	
Regular employees can apply themselves to advanced tasks	10.62	31.82	43.73	8.78	2.89	2.15	30.77	Regular employees cannot apply themselves to their original tasks	

Note: I: Close to A, II: Closer to A than B, III: Neither, IV: Closer to B than A, V: Close to B, D.I is an abbreviation for Diffusion Index. It is obtained by the formula: (I+II) - (IV+V). Items are arranged in ascending order of D.I. Samples are male and female regular employees under 60 years old.

two items, “Hard to conduct vocational training” and “Hard to accumulate/hand down know-how” are also confirmed as the result of the company survey as negative impact caused by the use of non-regular employees. Thus it may be said that the problems caused by the use of non-regular employees are summarized in the problems of vocational training and accumulation/handing down of know-how.

Based on both the company survey and worker survey conducted by JIL Survey, it turned out that the biggest problem caused by the use of non-regular employees is a question that has bearings on the fundamental character of human resources development.

The next section conducts a regression analysis focusing on the impact of using non-regular employees on vocational training which may be the central question among problems with the use of non-regular employees.

V. Regression Analysis 1: Company Survey Estimates

This section conducts a regression analysis to statistically verify the impact of functional changes such as quantitative changes in regular and non-regular employees and policy for the use of non-regular employees on firm-level training.

The regression analysis uses “Easy to conduct vocational training” as an explained variable to interpret the coefficient sign of explanatory variable. This paper interprets this as an indicator for “smoothness of OJT implementation.”

As mentioned above, a special emphasis has been placed on OJT among vocational training and the purpose of this paper is to verify how OJT has been affected by the use of non-regular employees. As will be noted from the question of the worker survey, the variable “Easy to conduct vocational training” indicates “vocational training when regular and non-regular employees are working together,” and it is natural to interpret that it is an indicator for OJT, not Off-JT.⁷

Therefore, the variable “Easy to conduct vocational training” is considered to indicate the smoothness of OJT implementation and is a suitable variable to verify the impact of using non-regular employees on OJT at workplaces. Particularly, explained variables are used as: 5 = “Easy to conduct vocational training,” 4 = “Tend to be easy to conduct vocational training,” 3 = “Neither,” 2 = “Tend to be hard to conduct vocational training” and 1 = “Hard to conduct vocational training.”

Since the explained variables are sequence indicators from 1 to 5, Ordered Probit Regression is adopted as an estimate method.

Variables to be introduced to explanatory variables are shown in Table 3.

In order to consider the impact of quantitative change in regular and non-regular employees on OJT, we include “Change ratio of the number of regular employees compared

⁷ However, it is impossible to identify whether questions indicate planned OJT or normal OJT such as guidance and advice. Therefore, this paper interprets it as “broad OJT” including both planned and normal OJT.

Table 3. Definition of Variables

Explained variables

【Smoothness of OJT implementation】
 5=Easy to conduct vocational training, 4=Tend to be easy to conduct vocational training
 3=Neither, 2=Tend to be hard to conduct vocational training, 1=Hard to conduct vocational training

Explaining variables

Quantitative change in regular and non-regular employees

【Change ratio of the number of regular employees compared with three years ago】
 1=150% or higher, 2=140 to less than 150%, 3=130 to less than 140%, 4=120 to less than 130%,
 5=110 to less than 120%, 6=100 to less than 110%, 7=90 to less than 100%, 8=80 to less than 90%,
 9=70 to less than 80%, 10=60 to less than 70%, 11=50 to less than 60%, 12=40 to less than 50%,
 13=Lower than 40%

【Change ratio of the number of non-regular employees compared with three years ago】
 Prepared as same as change ratio of the number of regular employees

【Employment change in regular employees due to the use of non-regular employees】
 Each dummy of “Increased,” “No change”[†] and “Decreased”

Company’s policy for using non-regular employees

【What tasks are non-regular employees currently used for?】
 “Routine tasks in which regular employees had conducted” dummy
 “Nonroutine tasks including judgment in which regular employees conduct” dummy
 “Tasks that require advanced professional skills in which regular employees conduct” dummy
 “Tasks that require advanced professional skills in which regular employees do not conduct” dummy
 “Office management/supervision” dummy

Ability development policy which represents company’s property, Company’s personnel strategy

【Dummy of maintenance of lifetime employment】
 1=Lifetime employment continues to be maintained in principle
 0=Unavoidable to revise partially, Fundamental review is needed, Not lifetime employment

【Emphasis on seniority payment system】
 4=Emphasize, 3=Tend to emphasize, 2=Tend not to emphasize, 1=Do not emphasize

【Objects of ability development】
 4=All regular and non-regular employees, 3=All regular employees and partial non-regular employees,
 2=All regular employees (except non-regular employees), 1=Executive candidates among regular employees

Sales, Number of employees, Industry

【Sales (compared with three years ago)】
 -0.3=Decline by 20% or more, -0.15=Decline by 10 to less than 20%, -0.075=Decline by 5 to less than 10%,
 -0.03=Decline by less than 5%, 0=No change, 0.03=Increase by less than 5%,
 0.075=Increase by 5 to less than 10%, 0.15=Increase by 10 to less than 20%, 0.3=Increase by 20% or more

【Number of employees】
 Each dummy of “Less than 100,” “100 to 299,” “300 to 499,” “500 to 999,” “1000 to 4999” and “5000 or more”

【Industry】
 Each dummy of “Manufacturing,” “Mining/Construction/Utilities,” “Communications/Transport,”[†]
 “Wholesale/Retail/Restaurant,” “Finance/Insurance/Real estate,” “Service” and “Others”

Note: † indicates reference groups. There are 29 industries to be selected in the company survey slip, but they are classified into seven industries in this paper.

with three years ago,” “Change ratio of the number of non-regular employees compared with three years ago” and “Employment change in regular employees due to the use of non-regular employees” in the regression.

Next, in order to consider the impact of non-regular employees who become core taskforce on OJT, “Company’s policy for using non-regular employees” (What tasks are non-regular employees currently used for?) is included into the explanatory variables.

“Ability development policy which represents company’s property” and “Company’s

personnel strategy” are also introduced into the explanatory variables to control the company property. Particularly, “Dummy of maintenance of lifetime employment,” “Emphasis on seniority payment system” and “Objects of ability development” are included.

Finally, “Sales (compared with three years ago),” “Number of employees” and “Industry” are included as control variables.

The descriptive statistics are shown in Table 4.

Above variables were included into the explanatory variables and the regression analysis was conducted with “Smoothness of OJT implementation” as an explained variable (estimated results are shown in Table 5).

Focusing on variables related to the change ratio of the number of regular/non-regular employees, while “Change ratio of the number of non-regular employees compared with three years ago” has no significant impact on OJT, “Change ratio of the number of regular employees compared with three years ago” has a significant negative impact on it at 10% level. That is, the impediment to OJT due to the use of non-regular employees is not caused by the increase in the number of non-regular employees but by the decrease in the number of regular employees.

Hara (2007) also indicated that companies which are constantly understaffed have less opportunities of receiving business guidance and advice. It would appear that since the burden of original tasks has increased due to the decrease in the number of regular employees at workplaces and they have no “leeway” in terms of personnel and time state which is essential for OJT, OJT has not functioned smoothly⁸.

Next, “Employment change in regular employees due to the use of non-regular employees: Decrease” has a significant negative impact on OJT at 1% level. It tells that it is difficult to implement OJT for companies in which the employment of regular employees decreases due to the use of non-regular employees. This result indicates that OJT implementation has a problem within the company in which non-regular employees may be used as replacement for regular employees.

Toyoda (2004) also pointed out that the increase in part-time workers causes long working hours of regular employees. The replacement of regular employees by non-regular ones would mean that one non-regular employee is in charge of the job that one regular employee should be in charge of. In fact, however, given working hours and responsibility for jobs, it is difficult that one non-regular employee is in charge of jobs of one regular employee. As a result, remaining regular employees are facing the increase in the burden of jobs and responsibilities and it may have an impediment to smooth OJT implementation.

Taking into account the fact that “change ratio of the number of non-regular employees compared with three years ago” has no significant impact, OJT problems due to the use of non-regular employees is not caused by the quantitative increase in the number of

⁸ Koike (2001) also emphasized the importance of “leeway” in terms of personnel and time state for one-on-one in implementing OJT and pointed out that such “leeway” has been strictly reduced.

Table 4. Descriptive Statistics (Company Survey), N=911

Variables	Mean	S.D	Min	Max
Smoothness of OJT implementation (Easy to conduct vocational training)	2.888	0.608	1	5
Change ratio of the number of regular employees compared with three years ago	5.880	1.958	1	13
Change ratio of the number of non-regular employees compared with three years ago	7.479	3.177	1	13
Employment change in regular employees due to the use of non-regular employees: Decrease	0.539	0.499	0	1
Employment change in regular employees due to the use of non-regular employees: No change	0.402	0.491	0	1
Employment change in regular employees due to the use of non-regular employees: Increase	0.059	0.236	0	1
Routine tasks in which regular employees had conducted	0.911	0.285	0	1
Nonroutine tasks including judgment in which regular employees conduct	0.244	0.430	0	1
Tasks that require advanced professional skills in which regular employees conduct	0.205	0.404	0	1
Tasks that require advanced professional skills in which regular employees do not conduct	0.109	0.311	0	1
Office management/supervision	0.103	0.304	0	1
Objects of ability development	2.603	1.053	1	4
Dummy of maintenance of lifetime employment	0.347	0.476	0	1
Emphasis on seniority payment system	2.853	0.860	1	4
Sales (operating revenue): Comparison with three years ago	-0.021	0.161	-0.3	0.3
Number of employees: less than 100	0.032	0.176	0	1
Number of employees: 100 to 299	0.476	0.500	0	1
Number of employees: 300 to 499	0.169	0.375	0	1
Number of employees: 500 to 999	0.151	0.359	0	1
Number of employees: 1000 to 4999	0.156	0.363	0	1
Number of employees: 5000 or more	0.015	0.123	0	1
Manufacturing	0.245	0.430	0	1
Mining/Construction/Utilities	0.162	0.369	0	1
Communications/Transport	0.116	0.321	0	1
Wholesale/Retail/Restaurant	0.189	0.392	0	1
Finance/Insurance/Real estate	0.087	0.282	0	1
Service	0.179	0.383	0	1
Other Industry	0.022	0.147	0	1

non-regular employees but by the functional problem of human resources management replacing regular employees by non-regular ones.

Focusing attention on the policy for the use of non-regular employees, “Used for office management/supervision” has only significant impact on OJT (coefficient = 0.434, significant at 1% level). Since when non-regular employees are in charge of highly advanced

Table 5. “Company Survey” Entire Estimate
(Explained Variable: “Smoothness of OJT Implementation”)

Explanatory variables	Coef.	Z-value
Change ratio of the number of regular employees compared with three years ago	-0.042	-1.82 *
Change ratio of the number of non-regular employees compared with three years ago	-0.021	-1.63
Employment change in regular employees due to the use of non-regular employees: Decrease 【No change】	-0.279	-3.16 ***
Employment change in regular employees due to the use of non-regular employees: Increase	0.007	0.04
Routine tasks in which regular employees had conducted	0.199	1.40
Nonroutine tasks including judgment in which regular employees conduct	-0.101	-1.06
Tasks that require advanced professional skills in which regular employees conduct	-0.065	-0.63
Tasks that require advanced professional skills in which regular employees do not conduct	0.182	1.39
Office management/supervision	0.434	3.16 ***
Objects of ability development	0.032	0.85
Dummy of maintenance of lifetime employment	0.017	0.20
Emphasis on seniority payment system	0.037	0.81
Sales (operating revenue): Comparison with three years ago	0.635	2.31 **
/cut1	-2.228	
/cut2	-1.024	
/cut3	1.186	
/cut4	2.621	
Log likelihood	-784.859	
N		911

Note: Ordered Probit Regression is estimated. 【】= Reference group. ***, ** and * indicate significant levels at 1%, 5% and 10%, respectively. Number of employees, and industry dummy variables are included in the regression. But the coefficient are suppressed.

jobs such as office management/supervision, jobs of non-regular and regular employees may be clearly separated, OJT would function smoothly. For this reason, the functional problem of human resources management, i.e., what tasks non-regular employees are used for, has a large impact on firm-level training.

However, there are few variables related to the policy for the use of non-regular employees which has a significant impact, and the impact of the company’s policy for the use of non-regular employees on firm-level training could not be considered sufficiently from the entire estimate of the company survey. This may be because different impacts of industries were countered by themselves due to the integrated estimate.

Therefore, in order to verify the impact of each industry’s policy for the use of non-regular employees, it is estimated by industry. In the estimate by industry, “Wholesale/Retail/Restaurant” in which the use of non-regular employees has progressed most and “Manufacturing” which has been researched in the previous studies were picked up to

Table 6. “Company Survey” Estimate by Industry
(Explained Variable: “Smoothness of OJT Implementation”)

Explanatory variables	Wholesale/Retail/Restaurant		Manufacturing	
	Coef.	Z-value	Coef.	Z-value
Change ratio of the number of regular employees compared with three years ago	0.031	0.53	0.007	0.14
Change ratio of the number of non-regular employees compared with three years ago	0.002	0.05	-0.057	-2.13 **
Employment change in regular employees due to the use of non-regular employees: Decrease 【No change】	-0.431	-1.98 **	-0.532	-2.88 ***
Employment change in regular employees due to the use of non-regular employees: Increase	-0.169	-0.45	-0.869	-1.53
Routine tasks in which regular employees had conducted	0.462	1.08	-0.375	-1.03
Nonroutine tasks including judgment in which regular employees conduct	-0.514	-2.41 **	0.652	2.81 ***
Tasks that require advanced professional skills in which regular employees conduct	0.025	0.10	-0.003	-0.01
Tasks that require advanced professional skills in which regular employees do not conduct	0.417	1.27	-0.696	-2.14 **
Office management/supervision	0.872	2.39 **	0.571	1.55
Objects of ability development	-0.007	-0.08	0.042	0.52
Dummy of maintenance of lifetime employment	-0.279	-1.29	0.065	0.36
Emphasis on seniority payment system	-0.017	-0.15	0.236	2.01 **
Sales (operating revenue): Comparison with three years ago	0.042	0.06	1.001	1.75 *
/cut1	-1.768		-2.964	
/cut2	-0.588		-1.192	
/cut3	1.719		1.157	
/cut4	3.130			
Log likelihood		-148.417		-172.517
N		172		223

Note: Ordered Probit Regression is estimated. 【】= Reference group. ***, ** and * indicate significant levels at 1%, 5% and 10%, respectively. Number of employees dummy variables are included in the regression. But the coefficient are suppressed.

estimate.⁹ The estimate results are shown in Table 6.

Focusing attention on variables related to the change ratio of the number of regular and non-regular employees, manufacturing industry’s “Change ratio of the number of non-regular employees compared with three years ago” is the only significant variable (coefficient = -0.057, significant at 5% level). In other words, in the manufacturing industry, the quantitative decrease in non-regular employees may disturb OJT, but in the whole-

⁹ According to the Ministry of Internal Affairs and Communications “Employment Status Survey” (2007), industries with high ratio of part-time workers are “Restaurants and lodging” (32.3%) and “Wholesale/retail” (27.1%). Industries with high ratio of *arubaito* (fringe workers) are also “Restaurants and lodging” (31.6%) and “Wholesale/retail” (12.6%). Therefore, the use of non-regular employees has progressed most in those industries.

sale/retail/restaurant industry, regardless of regular or non-regular employees, the quantitative employment change has no significant impact on OJT. Even in those industries in which the use of non-regular employees has progressed, the quantitative increase in non-regular employees has no negative impact on OJT.

However, in both wholesale/retail/restaurant and manufacturing industries, “Employment change in regular employees due to the use of non-regular employees: Decrease” has a negative impact on OJT at 5% level and 1% level respectively. It turns out that OJT implementation is disturbed in companies in which the employment of regular employees is reduced by the use of non-regular employees. That is, it is highly possible that OJT is not implemented smoothly in companies which may have replaced regular employees by non-regular employees. This impact is especially greater in manufacturing industry.

This result was also confirmed by the entire estimate (see Table 5) so it can be said strongly that OJT is hard to function in companies which have replaced regular employees by non-regular employees. In manufacturing industry, since OJT on site is core training, it may be especially susceptible to the impact of the use of non-regular employees as substitutes for regular employees.

Next, focusing attention on the impact of the policy for the use of non-regular employees on vocational training, clear differences between industries are highlighted. In the wholesale/retail/restaurant industry, OJT does not function smoothly in companies which use non-regular employees for “Nonroutine tasks including judgment in which regular employees conduct.” In contrast, in the manufacturing industry, OJT functions in companies which use non-regular employees for “Nonroutine tasks including judgment in which regular employees conduct.”

If this is interpreted as the difference of the impact between industries caused by non-regular employees who have become core workforce, since it is not that special to use non-regular employees for advanced tasks in which regular employees conduct and the emphasis is on skill levels regardless of the employment pattern in the manufacturing industry, making non-regular employees to be core workforce may make smooth OJT implementation.¹⁰

On the other hand, in the wholesale/retail/restaurant industry, the job separation between regular and non-regular employees may be generally ambiguous. Therefore, making non-regular employees to be core workforce, i.e., using non-regular employees for non-routine tasks in which regular employees conduct may increase the burden of regular employees who provide vocational training to non-regular employees and as a result, OJT may not function smoothly.

Regarding variables related to the policy for the use of non-regular employees, there was no significant result found in the entire estimate in Table 5, but there were different

¹⁰ Muramatsu (2007) indicated that the smooth production is done in auto companies which “take” non-regular employees into their workplaces. It is consistent with the estimated result of this paper.

findings depending on the industry in the estimate by industry in Table 6. In the manufacturing industry, although non-regular employees' core workforce contributes to the smooth implementation of firm-level training, in the wholesale/retail/restaurant industry, their core workforce may disturb firm-level training.¹¹

According to the estimate by industry, it was also confirmed that whether OJT smoothly functions or not is not caused by the quantitative increase in non-regular employees but by the functional problem of human resources management using non-regular employees as substitutes for regular employees.

VI. Regression Analysis 2: Worker Survey Estimates

Next, the impact of using non-regular employees on firm-level training is analyzed from the viewpoint of workers (regular employees) using the worker survey results. While the worker survey surveyed regular employees and loaned workers about "Situations seen when regular and non-regular employees are working together," the worker survey estimates only use answers from regular employees who directly experienced changes in firm-level personnel system and management strategies.

Since the preference of workers aged 60 or over is expected to differ greatly from that of workers under 60 years old due to the existence of retirement age system and reemployment system, samples shall be regular employees under 60 years old.

As same as the company survey estimates, "Smoothness of OJT implementation (Easy to conduct vocational training)" is used as an explained variable. Ordered Probit Regression is also adopted as an estimate method as same as the company survey estimates.

We included increased/decreased number of non-regular employees dummy,¹² increased/decreased number of regular employees dummy, monthly average working hours, number of employees, company's business condition (results), industry dummy,¹³ age, female dummy, education dummy, annual wage and occupation dummy as explanatory variables.

Regarding monthly average working hours and annual wage, since the answers were received as class values, log-transformed real median values in each category were used as variables (descriptive statistics are shown in Table 7).

Above variables were introduced into explanatory variables and the regression analysis was conducted using "smoothness of OJT implementation" as an explained variable (see

¹¹ Cappelli and Neumark (2004) also found that the relationship between "functional flexibility" and "quantitative flexibility" in the manufacturing industry is different from that in the non-manufacturing industry.

¹² Changes in the number of both non-regular and regular employees compared with the previous year.

¹³ Although 21 industries are to be selected in the worker survey, variables which classify them into seven industries are introduced as same as the company survey estimates. The reference group is also "Communications/Transport" as same as the company survey.

Table 7. Descriptive Statistics (Worker Survey), N=3175

Variables	Mean	S.D	Min	Max
Smoothness of OJT implementation (Easy to conduct vocational training)	2.885	0.740	1	5
Number of regular employees: Increase [†]	0.140	0.347	0	1
Number of regular employees: No change	0.243	0.429	0	1
Number of regular employees: Decrease	0.573	0.495	0	1
Number of regular employees: Do not know	0.044	0.206	0	1
Number of non-regular employees: Increase [‡]	0.501	0.500	0	1
Number of non-regular employees: No change	0.231	0.421	0	1
Number of non-regular employees: Decrease	0.179	0.383	0	1
Number of non-regular employees: Do not know	0.089	0.285	0	1
Log (Monthly average working hours)	5.054	0.543	2.708	5.635
Company's business condition (results): Good (very good+good)	0.203	0.402	0	1
Company's business condition (results): Not bad	0.253	0.435	0	1
Company's business condition (results): Bad (bad+very bad)	0.520	0.500	0	1
Company's business condition (results): Do not know	0.024	0.154	0	1
Number of employees: less than 100	0.009	0.097	0	1
Number of employees: 100 to 299	0.310	0.463	0	1
Number of employees: 300 to 499	0.199	0.399	0	1
Number of employees: 500 to 999	0.210	0.407	0	1
Number of employees: 1000 to 4999	0.177	0.382	0	1
Number of employees: 5000 or more	0.095	0.293	0	1
Age: 18 to 29 years old	0.267	0.443	0	1
Age: 30 to 39 years old	0.341	0.474	0	1
Age: 40 to 49 years old	0.230	0.421	0	1
Age: 50 to 59 years old	0.162	0.368	0	1
Manufacturing	0.274	0.446	0	1
Mining/Construction/Utilities	0.163	0.369	0	1
Communications/Transport	0.083	0.276	0	1
Wholesale/Retail/Restaurant	0.107	0.309	0	1
Finance/Insurance/Real estate	0.149	0.356	0	1
Service	0.190	0.393	0	1
Other Industry	0.034	0.180	0	1
Female	0.305	0.461	0	1
Junior high school graduate	0.015	0.123	0	1
High school graduate	0.286	0.452	0	1
Special training/Technical/Junior college graduate	0.186	0.389	0	1
Undergraduate/Graduate school graduate	0.513	0.500	0	1
Log (Annual Wage)	15.332	0.459	13.592	16.706
Professional job	0.100	0.301	0	1
Technical job	0.073	0.260	0	1
Office job	0.208	0.406	0	1
Administrative job	0.468	0.499	0	1
Sales job	0.048	0.214	0	1
Service job	0.030	0.170	0	1
Security job	0.006	0.075	0	1
Transport/Communications job	0.019	0.137	0	1
Skilled workman/Production process	0.036	0.186	0	1
Labor	0.011	0.106	0	1

Note: Number of regular employees and number of non-regular employees are compared with the previous year.

Table 8. “Worker Survey” Estimate
(Explained Variable: “Smoothness of OJT Implementation”)

Explanatory variables	Coef.	Z-value
Number of regular employees: Increase 【No change】	0.035	0.51
Number of regular employees: Decrease	-0.151	-2.84 ***
Number of regular employees: Do not know	-0.139	-1.06
Number of non-regular employees: Increase 【No change】	-0.021	-0.40
Number of non-regular employees: Decrease	0.057	0.85
Number of non-regular employees: Do not know	0.146	1.48
Log (Monthly average working hours)	-0.106	-2.81 ***
Company’s business condition (results): Good 【Not Bad】	0.183	3.00 ***
Company’s business condition (results): Bad	-0.231	-4.57 ***
Company’s business condition (results): Do not know	0.004	0.03
Number of employees: less than 100 【Number of employees: 300-499】	0.156	0.73
Number of employees: 100 to 299	0.148	2.50 **
Number of employees: 500 to 999	0.179	2.84 ***
Number of employees: 1000 to 4999	0.163	2.43 **
Number of employees: 5000 or more	0.240	2.83 ***
Age: 18 to 29 years old 【Age: 50 to 59 years old】	-0.040	-0.48
Age: 30 to 39 years old	-0.177	-2.57 ***
Age: 40 to 49 years old	-0.104	-1.55
Manufacturing 【Communications/Transport】	-0.145	-1.63
Mining/Construction/Utilities	0.032	0.34
Wholesale/Retail/Restaurant	-0.303	-3.00 ***
Finance/Insurance/Real estate	0.010	0.10
Service	-0.136	-1.49
Other Industry	0.097	0.72
/cut1	-2.690	
/cut2	-1.847	
/cut3	0.149	
/cut4	1.133	
Log likelihood	-3223.564	
N	3175	

Note: Ordered Probit Regression is estimated. Samples are regular employees under 60 years old. **【】**= Reference group. “Female,” “Log (Annual Wage),” “Education” and “Occupation” are included in the regression. But the coefficient are suppressed. ***, ** and * indicate significant levels at 1%, 5% and 10%, respectively.

the estimated results in Table 8).

Firstly, focusing on variables related to the change in the number of regular and non-regular employees, the change in the number of non-regular employees has no significant impact. On the other hand, regarding the change in the number of regular employees, “Number of regular employees: Decrease” has a significant negative impact on vocational training at 1% level. This result is consistent with the estimated result of the company survey (see Table 5). It also turns out from the worker survey that the impact of firm-level training due to the use of non-regular employees is not caused by the quantitative increase in non-regular employees but by the quantitative decrease in regular employees.

Next, “Monthly average working hours” has a significant negative impact on the vocational training at 1% level. It turns out that OJT implementation is disturbed at workplaces in which regular employees’ working hours are long. In companies in which regular employees are working long hours, OJT may be disturbed due to too many tasks of regular employees. Adding that “Number of regular employees: Decrease” has a negative impact on the vocational training, OJT may not function smoothly in workplaces or companies in which the burden of regular employees has increased. Focusing on age dummy, “Age: 30 to 39 years old” has a significant negative impact at 1% level. It is estimated that regular employees in their thirties are most sensitive to the problem of firm-level training caused by the use of non-regular employees.

In addition, “Business condition (results)” has a significant positive impact on the vocational training at 1% level (both “Good” and “Bad”). Also in the estimated result of the company survey (see Table 5), “Sales (operating revenue)” has a significant positive impact on the vocational training at 5% level. It is confirmed that companies’ business conditions have a great impact on firm-level training.

Finally, focusing on industry dummy, “Wholesale/retail/restaurant” has a significant negative impact on the vocational training. It turns out from the worker survey that regular employees working in wholesale companies, retail companies and restaurants feel an impediment to the vocational training due to the use of non-regular employees. As confirmed from the estimated result in Table 6, it is suggested that the burden of regular employees working in wholesale companies, retail companies and restaurants has increased due to use of non-regular employees as substitutes for regular employees and progress of non-regular employees’ core workforce, and as a result, it may be impediment to the opportunities of training for regular employees.

VII. Conclusion

Based on the previous studies which found that the use of non-regular employees has a negative impact on firm-level training, this paper analyzed whether it is caused by the quantitative increase in non-regular employees or the functional problems such as the policy for the use of non-regular employees using both data of companies and workers. The major

conclusions obtained by this paper are the following three points:

Firstly, it was confirmed from both estimated results of the company survey and worker survey that the quantitative increase in non-regular employees has no significant impact as a cause of disturbing OJT implementation. It turned out that the impediment to OJT due to the use of non-regular employees is not caused by the quantitative increase in non-regular employees.

Secondly, according to the estimated result of the company survey, it was confirmed that OJT does not function smoothly in companies in which the employment of regular employees has been reduced due to the use of non-regular employees. This means OJT has not been conducted smoothly in companies which have replaced regular employees by non-regular employees. It indicated the possibility that the impact of using non-regular employees on the vocational training is not caused by the quantitative change in non-regular employees but by the functional problem using non-regular employees as substitutes for regular employees.

Thirdly, from the estimated results of both company and worker surveys, it was confirmed that firm-level training has not been implemented smoothly in companies in which the number of regular employees has decreased. According to the estimated result of the worker survey, OJT implementation has also been disturbed in companies in which regular employees are working long hours. It was confirmed that firm-level training has not been implemented smoothly in companies in which the burden of regular employees has increased.

From the analysis result of this paper, it was highlighted that the increase in the number of non-regular employees itself is not the cause of disturbing firm-level training, and the impact of using non-regular employees on the vocational training may be caused by the functional problem of human resources management; what tasks non-regular employees are used for and how to manage the burden of regular employees.

Finally, this paper refers to issues remained. "Smoothness of OJT implementation" which was used as a major analysis indicator in this paper is defined as just a "broad OJT" due to limited data and is still ambiguous. A more particular and objective indicator should be analyzed in the future.

The response to the endogenous problem is also an issue remained. It can be considered that the use of non-regular employees is not generated exogenously but based on the decision making of companies taking costs of long-term human resources development for regular employees into account. This paper remains an issue on the response to such endogenous problem.

In order to overcome these issues, further accumulation of data on the use of non-regular employees and the impact are required. The accumulation of data is expected for further progress of the studies in the future.

References

- Aizawa, Naoki, and Atsuhiko Yamada. 2008. Joyo, hijoyo koyokan no ido bunseki: "Shokugyo kozo kihon chosa" ni motozuku 5-jitenkan hikaku bunseki [Transition of employment status between regular and temporary work: A flow analysis based on the Employment Status Survey 1982-2002]. *Mita Journal of Economics* 101, no. 2:33-63.
- Ariga, Kenn, Ryo Kambayashi, and Yoshihide Sano. 2008. Hiseishain no katsuyo hoshin to koyo kanri shisaku no koka [The effect of training policy for non-regular workers and human resource management practices]. *The Japanese Journal of Labour Studies* 50, no. 8:78-97.
- Arulampalam, Wiji, and Alison Booth. 1998. Training and labour market flexibility: Is there a trade-off? *British Journal of Industrial Relations* 36, no. 4:521-66.
- Blank, Rebecca. 1998. Labor market dynamics and part-time work. *Research in Labor Economics* 17:57-93.
- Booth, Alison, Marco Francesconi, and Jeff Frank. 2002. Temporary jobs: Stepping stones or dead ends? *Economic Journal* 112:F189-F213.
- Cappelli, Peter. 1999. *The new deal at work: Managing the market-driven workforce*. Boston, MA: Harvard Business School Press.
- Cappelli, Peter, and David Neumark. 2004. External churning and internal flexibility: Evidence on the functional flexibility and core-periphery hypotheses. *Industrial Relations* 43, no.1:148-82.
- Chalmers, Jenny, and Guyonne Kalb. 2001. Moving from unemployment to permanent employment: Could a casual job accelerate the transition? *Australian Economic Review* 34, no. 4:415-36.
- Faber, Henry. 1999. Alternative and part-time employment arrangements as a response to job loss. *Journal of Labor Economics* 17, no. 4:S142-67.
- Gash, Venessa. 2008. Preference or constraint? Part-time workers' transitions in Denmark, France and the United Kingdom. *Work, Employment & Society* 22, no.4:655-74.
- Genda, Yuji. 2005. *Hataraku kajo: Otona no tame no wakamono dokuhon* [Overworking: Youth reader for adults]. Tokyo: NTT Shuppan.
- . 2008. Zenshoku ga hiseishain datta rishokusha no seishain eno iko ni tsuite [Transition into regular employment among separating non-regular employees]. *The Japanese Journal of Labour Studies* 50, no. 11:61-77.
- . 2009. Seishain ni natta hiseishain: Naibuka to tenshoku no sakini [How could non-regular employees become regular employees?: Transitions through internalization and separation]. *The Japanese Journal of Labour Studies* 51, no. 5:34-48.
- Hara, Hiromi. 2007. Nihon kigyō no noryoku kaihatsu: 70-nendai zenhan kara 2000-nendai zenhan no keiken kara [Private sector training in Japan between 1970s and 2000s]. *The Japanese Journal of Labour Studies* 49, no. 6:84-100.
- Kawaguchi, Daiji. 2006. The incidence and effect of job training among Japanese women. *Industrial Relations* 45, no. 3:469-77.
- Kimura, Takuma. 2002. Hiseishain, gaibu jinzai no katsuyo to shokuba no shomondai [Flexible staffing arrangements and workplace problems]. *The Japanese Journal of Labour Studies* 44, no.

8:27-38.

- Koike, Kazuo. 2001. Mondai, hoho, miidashita koto [Problems, methods and findings]. In *Monozukuri no gino: Jidosha sangyo no shokuba de* [Manufacturing skills: Workplace in auto industry], ed. Kazuo Koike, Hiroyuki Chuma and Souichi Ohta, 1-16. Tokyo: Toyo Keizai Shinposha.
- . 2005. *Shigoto no keizaigaku, dai 3-pan* [Business economics, third edition]. Tokyo: Toyo Keizai Shinposha.
- Kurosawa, Masako, and Hiromi Hara. 2009. Kigyonai kunren no jisshi kitei yoin ni tsuite no bunseki: Off-JT wo toriagete [Analysis on implementation provision factor of in-house training: Off-JT]. In *Hiseishain no Kigyonai Kunren ni tsuite no Bunseki: "Heisei 18-nendo Noryoku Kaihatsu Kihon Chosa" no Tokubetsu Shukei kara* [Analysis on in-house training for non-regular employees: From special aggregation of Human Resources Development Survey in FY2006], JILPT Research Report no. 110, 11-55. The Japan Institute for Labour Policy and Training, Tokyo.
- Ministry of Internal Affairs and Communications. 2007. Employment Status Survey.
- Muramatsu, Kuramitsu. 2004. Jidosha sangyo ni okeru hitenkeika to shokuba unei [Atypical employment and workplace management in auto industry]. In *Koyo to Shitsugyo ni kansuru Chosa Kenkyu Hokokusho (II)* [Research study report on employment and unemployment (II)], ed. Kansai Institute for Social and Economic Research, 179-92. Tokyo: Employment and Human Resources Development Organization of Japan.
- . 2007. Koyo no hiseikika, hinshitsu mondai to gino keisei: Jidosha sangyo no jirei yori [Employment of non-standard workers: Quality issues and skilldevelopment—A case study of auto industry]. *Quality* 37, no. 2:132-37.
- Ogura, Kazuya. 2007. *Endoresu wakazu: Hatarakisugi nihonjin no jituzo* [Endless workers: Overworked Japanese people]. Tokyo: Nihon Keizai Shinbun Shuppansha.
- Ohta, Souichi. 2006. Gino keisho to jakunen saiyo: Sono kanren to sokushinsaku wo megutte [Skill succession and youth employment: The relationship and promotion policies]. *The Japanese Journal of Labour Studies* 48, no. 5:17-30.
- Organisation for Economic Co-operation and Development (OECD). 2008. *Employment outlook*. Paris: OECD.
- O'Reilly, Jacqueline, and Silke Bothfeld. 2002. What happens after working part time?: Integration, maintenance or exclusionary transitions in Britain and Western Germany. *Cambridge Journal of Economics* 26, no. 4:409-39.
- Picchio, Matteo. 2008. Temporary contracts and transitions to stable jobs in Italy. *Labour* 22 (s1):147-74.
- Sano, Yoshihide. 2007. Jakunenso no noryoku kaihatsu ni okeru seishain, hiseishain no chigai [Difference of human resources development for youth between regular and non-regular employees]. In *Hatarakikata no Tayoka to Seifuthi Netto: Noryoku Kaihatsu to Waku Raifu Baransu ni Chakumoku shite* [Diversification of working styles and safety nets: Focusing on capability development and work-life balance], JILPT Research Report, no.75, 56-73. The Japan Institute for Labour Policy and Training, Tokyo.

- Sato, Hiroki, Yoshihide Sano, and Takuma Kimura. 2003. Dai 1-kai, seisan shokuba ni okeru konai ukeoi no katsuyo ni kansuru chosa “Hokokusho,” dai 2-han [Report on the first survey on the use of in-plant contract company workers at production sites. Second edition]. SSJ Data Archive Research Paper Series, SSJDA-24, Institute of Social Science, the University of Tokyo, Tokyo.
- Toyoda, Nao. 2004. Pato rodosha zoka no yoin: Kigyo kibo betsu ni yoru jikeiretsu bunseki [Factor in the increase in the number of part-time workers: Time-series analysis by company size]. *Journal of Ohara Institute for Social Research*, no.542:34-46.
- . 2005. Kasen sangyo to kyoso sangyo ni okeru hiseiki rodosha no zoka yoin: Denryokugyo, gasugyo suidogyo to oroshiurigyo, kourigyo, inshokuten wo taishoni [Factor in the increase in non-standard workers in oligopolistic industry and competitive industry: For power/gas/water industry and wholesale/retail/restaurant industry]. *Journal of Ohara Institute for Social Research*, no.556:41-52.
- Yasuda, Hiroki. 2008. Hiseisyain no katsuyo ga kigyonai kunren ni ataeru eikyo [Impact of the using non-regular employees on firm-level training]. *Journal of Ohara Institute for Social Research*, no.597:19-37.