

表3 訓練実施確率プロビット推計(有業者・就業希望無業者合計)

		勤め先訓練	自己啓発
雇用形態	女性	0.007 (0.002)	0.026 (0.001)
	正規(基準)		
	パート・アルバイト	-0.196 (0.001)	-0.072 (0.001)
	派遣社員	-0.170 (0.003)	-0.035 (0.003)
	契約社員・嘱託	-0.080 (0.003)	-0.001 (-0.003)
	その他+不詳	-0.118 (0.004)	0.025 (0.005)
	無業者	-0.292 (0.001)	-0.031 (0.002)
教育	小学・中学	-0.108 (0.003)	-0.069 (0.002)
	高校(基準)		
	専門学校・短大・高専	0.099 (0.002)	0.104 (0.002)
	大学・大学院	0.167 (0.002)	0.214 (0.002)
年齢	15-19	0.035 (0.008)	0.000 (-0.006)
	20-24(基準)		
	25-29	-0.043 (0.003)	-0.009 (0.002)
	30-34	-0.058 (0.003)	-0.019 (0.002)
	35-39	-0.056 (0.003)	-0.024 (0.002)
	40-44	-0.036 (0.003)	-0.017 (0.002)
	45-49	-0.023 (0.003)	-0.019 (0.002)
	50-54	-0.037 (0.003)	-0.033 (0.002)
	55-59	-0.061 (0.003)	-0.044 (0.002)
	観測数	427,558	427,558
Pseudo R2	0.111	0.067	

注: 係数は平均値で評価した限界効果。かつこ内は特定化の誤りに関して頑健な標準誤差。

表4 訓練実施確率プロビット推計(有業者)

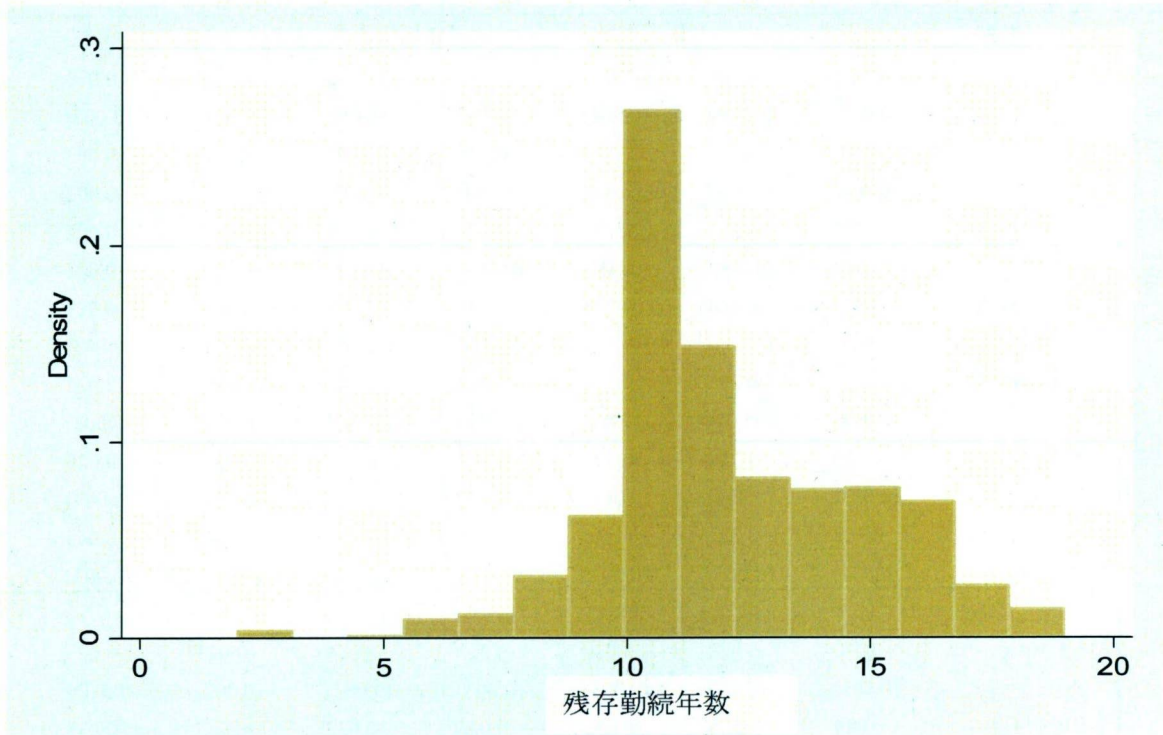
		勤め先訓練				自己啓発			
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	女性	0.024 (0.002)	-0.036 (0.002)	-0.014 (0.002)	-0.037 (0.002)	0.035 (0.001)	0.000 (-0.002)	0.000 (-0.002)	-0.009 (0.002)
雇用形態	正規(基準)								
	パート・アルバイト	-0.193 (0.002)	-0.171 (0.002)	-0.185 (0.002)	-0.168 (0.002)	-0.075 (0.002)	-0.062 (0.002)	-0.064 (0.002)	-0.056 (0.002)
	派遣社員	-0.199 (0.003)	-0.171 (0.004)	-0.176 (0.004)	-0.163 (0.004)	-0.044 (0.003)	-0.020 (0.004)	-0.018 (0.004)	-0.012 (0.004)
	契約社員+嘱託	-0.102 (0.003)	-0.100 (0.003)	-0.096 (0.003)	-0.096 (0.003)	-0.016 (0.003)	-0.017 (0.003)	-0.010 (0.003)	-0.012 (0.003)
	小学・中学	-0.077 (0.003)	-0.067 (0.003)	-0.061 (0.003)	-0.062 (0.003)	-0.064 (0.002)	-0.059 (0.003)	-0.053 (0.003)	-0.052 (0.003)
教育	高校(基準)								
	専門学校・短大・高専	0.108 (0.002)	0.059 (0.002)	0.063 (0.002)	0.047 (0.002)	0.105 (0.002)	0.069 (0.002)	0.063 (0.002)	0.054 (0.002)
	大学・大学院	0.126 (0.002)	0.085 (0.002)	0.068 (0.002)	0.064 (0.002)	0.187 (0.002)	0.151 (0.002)	0.130 (0.002)	0.124 (0.002)
年齢	15-19	0.019 (0.009)	0.032 (0.009)	0.019 (0.009)	0.031 (0.009)	-0.021 (0.007)	-0.015 (0.007)	-0.020 (0.007)	-0.015 (0.007)
	20-24(基準)								
	25-29	-0.050 (0.003)	-0.049 (0.003)	-0.048 (0.003)	-0.048 (0.003)	0.002 (-0.003)	0.003 (-0.003)	0.003 (-0.003)	0.003 (-0.003)
	30-34	-0.073 (0.003)	-0.073 (0.003)	-0.070 (0.003)	-0.072 (0.003)	0.002 (-0.003)	0.004 (-0.003)	0.004 (-0.003)	0.003 (-0.003)
	35-39	-0.083 (0.003)	-0.086 (0.003)	-0.081 (0.003)	-0.084 (0.003)	-0.003 (-0.003)	-0.003 (-0.003)	-0.002 (-0.003)	-0.003 (-0.003)
	40-44	-0.075 (0.003)	-0.083 (0.003)	-0.076 (0.003)	-0.082 (0.003)	-0.002 (-0.003)	-0.005 (-0.003)	-0.003 (-0.003)	-0.005 (0.003)
	45-49	-0.077 (0.003)	-0.087 (0.003)	-0.076 (0.004)	-0.086 (0.003)	-0.010 (0.003)	-0.015 (0.003)	-0.009 (0.003)	-0.013 (0.003)
	50-54	-0.101 (0.003)	-0.110 (0.003)	-0.097 (0.003)	-0.107 (0.003)	-0.028 (0.003)	-0.031 (0.003)	-0.024 (0.003)	-0.028 (0.003)
	55-59	-0.126 (0.003)	-0.133 (0.003)	-0.122 (0.003)	-0.131 (0.003)	-0.041 (0.003)	-0.044 (0.003)	-0.037 (0.003)	-0.040 (0.003)

(続き)

		勤め先訓練				自己啓発				
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
従業員規模	1～9人(基準)									
	10～29人	0.090 (0.004)	0.084 (0.004)	0.085 (0.004)	0.082 (0.004)	-0.003 -0.002	-0.005 (0.002)	-0.006 (0.002)	-0.006 (0.002)	
	30～99人	0.140 (0.003)	0.136 (0.004)	0.135 (0.004)	0.134 (0.004)	0.002 (-0.002)	-0.001 (-0.002)	-0.002 -0.002	-0.001 -0.002	
	100～299人	0.201 (0.004)	0.200 (0.004)	0.195 (0.004)	0.198 (0.004)	0.009 (0.003)	0.008 (0.003)	0.004 -0.002	0.006 (0.003)	
	300～499人	0.243 (0.004)	0.244 (0.005)	0.238 (0.005)	0.241 (0.005)	0.023 (0.003)	0.026 (0.003)	0.018 (0.003)	0.023 (0.003)	
	500～999人	0.258 (0.004)	0.266 (0.005)	0.255 (0.004)	0.262 (0.005)	0.026 (0.003)	0.035 (0.003)	0.022 (0.003)	0.030 (0.003)	
	1000人以上	0.300 (0.003)	0.314 (0.004)	0.304 (0.003)	0.309 (0.004)	0.043 (0.003)	0.060 (0.003)	0.046 (0.003)	0.054 (0.003)	
	官公庁など	0.362 (0.004)	0.287 (0.005)	0.316 (0.004)	0.278 (0.005)	0.118 (0.003)	0.047 (0.004)	0.065 (0.003)	0.037 (0.004)	
	継続就業年数	0～4年(基準)								
		5～9年	0.020 (0.003)	0.022 (0.003)	0.020 (0.003)	0.021 (0.003)	-0.024 (0.002)	-0.023 (0.002)	-0.025 (0.002)	-0.024 (0.002)
10～14年		0.029 (0.003)	0.036 (0.003)	0.032 (0.003)	0.035 (0.003)	-0.032 (0.002)	-0.028 (0.002)	-0.031 (0.002)	-0.029 (0.002)	
15～19年		0.042 (0.003)	0.055 (0.003)	0.042 (0.003)	0.052 (0.003)	-0.028 (0.002)	-0.021 (0.002)	-0.030 (0.002)	-0.025 (0.002)	
20～24年		0.070 (0.004)	0.081 (0.004)	0.066 (0.004)	0.076 (0.004)	-0.017 (0.003)	-0.011 (0.003)	-0.023 (0.003)	-0.018 (0.003)	
25～29年		0.093 (0.004)	0.100 (0.004)	0.086 (0.004)	0.094 (0.004)	-0.010 (0.003)	-0.007 (0.003)	-0.019 (0.003)	-0.015 (0.003)	
30～34年		0.099 (0.005)	0.105 (0.005)	0.089 (0.005)	0.096 (0.005)	-0.005 (-0.003)	-0.002 (-0.003)	-0.016 (0.003)	-0.012 (0.003)	
35～39年		0.098 (0.006)	0.108 (0.006)	0.085 (0.006)	0.098 (0.006)	0.002 (-0.004)	0.007 (-0.004)	-0.010 (0.004)	-0.005 (-0.004)	
40年以上		0.084 (0.010)	0.092 (0.010)	0.071 (0.010)	0.083 (0.010)	0.006 (-0.008)	0.010 (-0.008)	-0.005 (-0.008)	-0.001 (-0.008)	
産業ダミー		no	yes	no	yes	no	yes	no	yes	
職業ダミー	no	no	yes	yes	no	no	yes	yes		
観測数	374,468	374,468	374,468	374,468	374,468	374,468	374,468	374,468		
Pseudo R2	0.109	0.135	0.125	0.140	0.080	0.103	0.104	0.111		

注:表3に同じ。

図1 残存勤続年数 男性 30歳、正規雇用、大学・大学院卒業における新卒と非新卒採用
新卒(median=12.000, mean=12.126)



非新卒採用(median=2.000, mean=2.203)

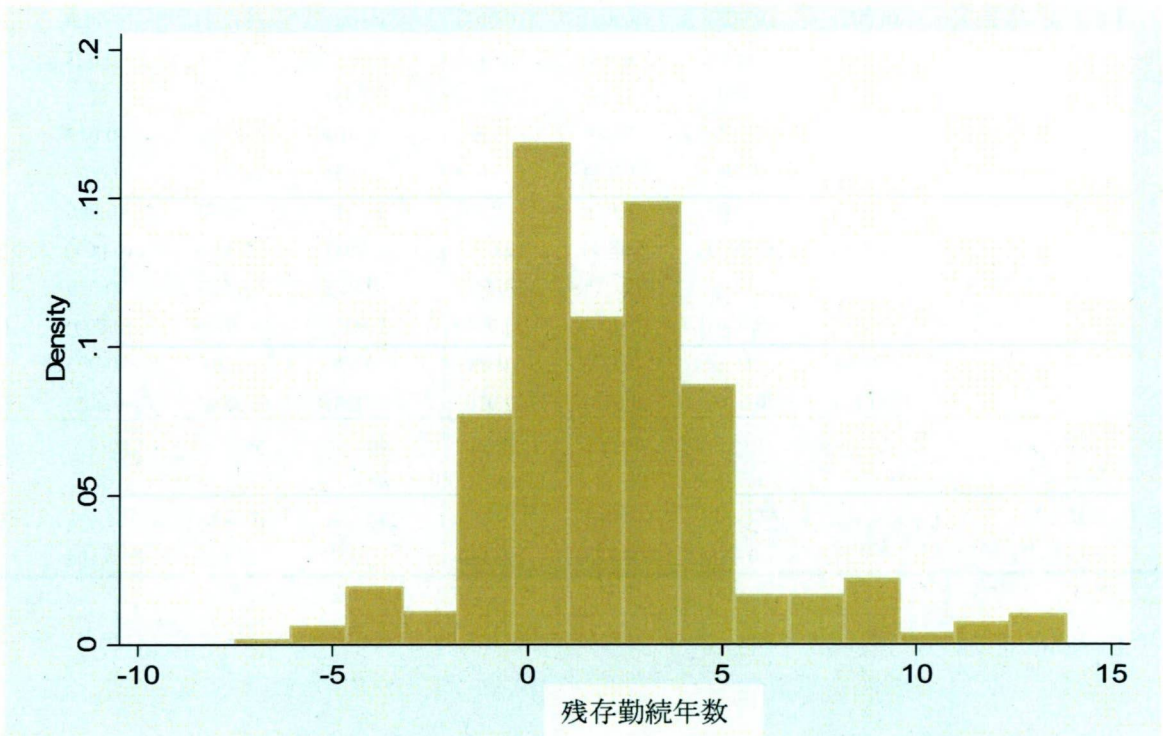
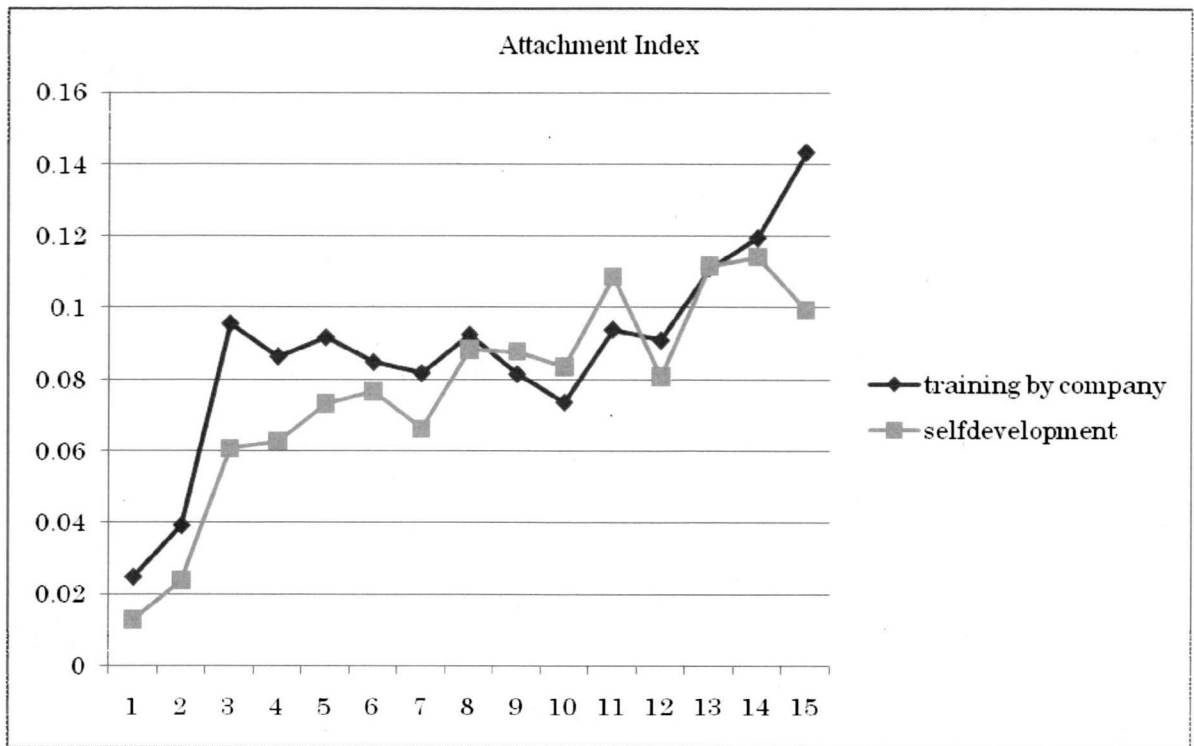
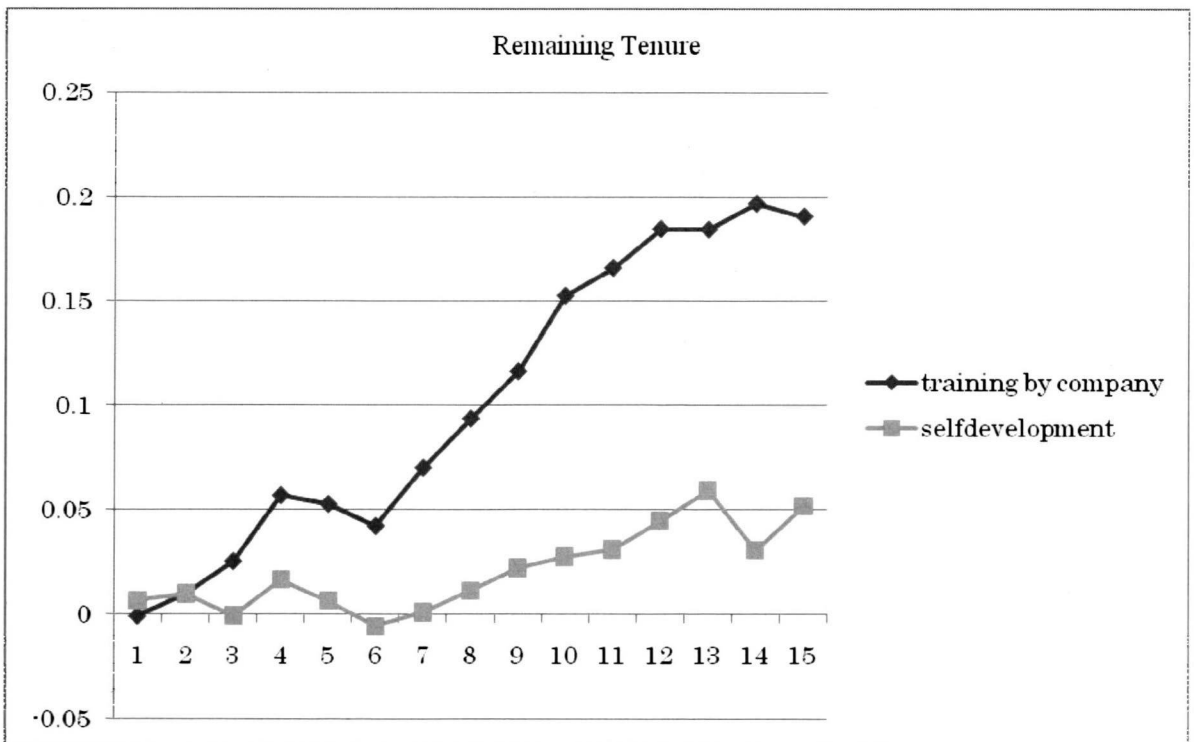


図2 労働市場への密着度が職業訓練参加に与える影響



注：全て統計的に有意。

図3 期待残存勤続年数が職業訓練参加に与える影響



注：2年目以降については企業訓練について統計的に有意。8年目以降については自己啓発について統計的に有意。

表5 AI、RTの訓練確率に与える影響

	勤め先訓練		自己啓発	
	(1)	(2)	(3)	(4)
女性	-0.035 (0.002)	-0.014 (0.002)	0.001 -0.002	0.006 (0.002)
正規(基準)				
パート・アルバイト	-0.186 (0.002)	-0.185 (0.002)	-0.060 (0.002)	-0.058 (0.002)
派遣社員	-0.174 (0.004)	-0.180 (0.004)	-0.005 -0.004	-0.007 (0.004)
契約社員+嘱託	-0.108 (0.003)	-0.111 (0.003)	-0.011 (0.003)	-0.011 (0.003)
小学・中学	-0.070 (0.003)	-0.057 (0.003)	-0.064 (0.002)	-0.059 (0.003)
高校(基準)				
専門学校・短大・高専	0.063 (0.002)	0.054 (0.002)	0.076 (0.002)	0.072 (0.002)
大学・大学院	0.075 (0.002)	0.065 (0.002)	0.157 (0.002)	0.154 (0.002)
AI	no	yes	no	yes
RT	no	yes	no	yes
観測数	374,468	374,468	374,468	374,468
Pseudo R2	0.133	0.135	0.100	0.103

注:各推計は産業ダミー、従業員規模ダミー、新卒ダミーを含んでいる。

付表 1(a) 基本統計量(有業者・就業希望無業者)

N=427,558

		Mean	Std. Dev.	Min	Max
	女性	0.499	0.500	0	1
雇用形態	正規(基準)	0.611	0.488	0	1
	パート・アルバイト	0.183	0.387	0	1
	派遣社員	0.024	0.152	0	1
	契約社員+嘱託	0.043	0.204	0	1
	その他+不詳	0.015	0.122	0	1
	無業者	0.124	0.330	0	1
教育	小学・中学	0.076	0.266	0	1
	高校	0.469	0.499	0	1
	専門学校・短大・高専	0.233	0.422	0	1
	大学・大学院	0.211	0.408	0	1
	不詳	0.012	0.108	0	1
年齢階層	年齢	40.6	11.271	15	59
	15-19	0.011	0.104	0	1
	20-24	0.079	0.269	0	1
	25-29	0.112	0.315	0	1
	30-34	0.134	0.340	0	1
	35-39	0.136	0.342	0	1
	40-44	0.127	0.332	0	1
	45-49	0.129	0.335	0	1
	50-54	0.130	0.336	0	1
	55-59	0.145	0.352	0	1

付表 1(b)基本統計量(有業者)

N=374,468

	Mean	Std. Dev.	Min	Max	
女性	0.464	0.499	0	1	
雇用形態ダミー	正規(基準)	0.697	0.460	0	1
	パート・アルバイト	0.209	0.407	0	1
	派遣社員	0.027	0.162	0	1
	契約社員+嘱託	0.050	0.217	0	1
	その他+不詳	0.017	0.130	0	1
教育ダミー	小学・中学	0.070	0.255	0	1
	高校(基準)	0.468	0.499	0	1
	専門学校・短大・高専	0.228	0.419	0	1
	大学・大学院	0.222	0.416	0	1
	不詳	0.011	0.107	0	1
年齢階層ダミー	年齢	40.8	11.242	15	59
	15-19	0.010	0.099	0	1
	20-24(基準)	0.078	0.269	0	1
	25-29	0.111	0.314	0	1
	30-34	0.130	0.336	0	1
	35-39	0.133	0.339	0	1
	40-44	0.127	0.333	0	1
	45-49	0.133	0.339	0	1
	50-54	0.133	0.340	0	1
	55-59	0.145	0.352	0	1
従業者規模ダミー	1~9人(基準)	0.138	0.345	0	1
	10~29人	0.136	0.343	0	1
	30~99人	0.159	0.366	0	1
	100~299人	0.136	0.343	0	1
	300~499人	0.056	0.230	0	1
	500~999人	0.061	0.240	0	1
	1000人以上	0.189	0.391	0	1
	官公庁など	0.118	0.322	0	1
	不詳	0.007	0.084	0	1
	継続就業年数ダミー	継続就業年数	11.47	10.677	0
0~4年		0.382	0.486	0	1
5~9年		0.169	0.374	0	1
10~14年		0.120	0.325	0	1
15~19年		0.108	0.310	0	1
20~24年		0.069	0.253	0	1
25~29年		0.062	0.241	0	1
30~34年		0.050	0.218	0	1
35~39年		0.033	0.177	0	1
40年以上		0.008	0.089	0	1
新卒	0.235	0.424	0	1	
期待密着度	11.73	8.409	0.0	32.8	
期待残存勤続年数	-1.73	8.353	-42.9	35.0	

付表2 年齢階層別勤め先訓練

		15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59
	女性	-0.042	-0.013	-0.022	-0.065	-0.053	-0.036	-0.023	-0.012	-0.027
		(0.018)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)
雇用形態	正規(基準)									
	パート・アル バイト	-0.246	-0.227	-0.215	-0.174	-0.164	-0.149	-0.165	-0.145	-0.117
		(0.017)	(0.007)	(0.006)	(0.006)	(0.006)	(0.007)	(0.007)	(0.006)	(0.005)
	派遣社員	-0.214	-0.192	-0.193	-0.169	-0.157	-0.146	-0.131	-0.104	-0.079
		(0.022)	(0.012)	(0.009)	(0.010)	(0.010)	(0.013)	(0.015)	(0.018)	(0.017)
契約社員・嘱 託		-0.080	-0.114	-0.122	-0.076	-0.106	-0.084	-0.078	-0.098	-0.056
		(0.036)	(0.010)	(0.008)	(0.010)	(0.010)	(0.011)	(0.011)	(0.009)	(0.008)
教育	小学・中学	-0.077	-0.045	-0.024	-0.027	-0.046	-0.052	-0.089	-0.066	-0.053
		(0.024)	(0.015)	(0.014)	(0.012)	(0.012)	(0.013)	(0.012)	(0.008)	(0.006)
	高校(基準)									
	専門学校・短 大・高専		0.109	0.057	0.044	0.043	0.037	0.044	0.051	0.041
			(0.008)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.007)	(0.007)
大学・大学院			0.148	0.098	0.069	0.064	0.057	0.071	0.060	0.030
			(0.010)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
観測数		3,670	29,380	41,428	48,706	49,738	47,718	49,762	49,795	54,268
Pseudo R2		0.138	0.126	0.120	0.115	0.131	0.146	0.164	0.167	0.150

注:すべての推定式は継続就業年数・従業者規模・産業・職業ダミーを含む。

Chapter 7

Training Opportunities for “Marginal Workers” in Japan

Abstract

Using microdata from the 2007 *Employment Status Survey*, this study empirically examines the situation concerning workers’ participation in employer-provided training and in self-development (activities pursued by workers to improve their skills on their own). Controlling for individuals’ attributes, we estimate the probabilities that workers pursue either kind of training, focusing in particular on how much lower the training probabilities for marginal workers (women, the less educated, and nonregular workers) are than for the relevant reference groups. Further, employing a standard human capital theory framework, we test the hypothesis that workers’ predicted labor market attachment – that is, how much time a worker will spend in the labor market – and, similarly, workers’ remaining tenure – that is, how many years a worker will continue to work for their present employer – determines employer-provided training and self-development. We find the following. First, controlling for age, employer size, years of tenure, industry, and occupation, the training probabilities for women, the less educated, and nonregular workers are lower than for the relevant reference groups. The differences are particularly large for employer-provided training. On the other hand, for self-development, there is almost no difference by sex, and the differences by age and by employer size are also small. In addition, differences in employer-provided training probabilities across levels of educational achievement and employment status are largest for the young. Second, while greater predicted labor market attachment increases participation in job training at the initiative of both employers (i.e., employer-provided training) and workers themselves (i.e., self-development), longer predicted remaining tenure increases participation in job training mainly at the initiative of employers. Third, the disadvantages for women and the less educated with regard to employer-provided training diminish to some extent once we control for labor market attachment and remaining tenure. However, the disadvantages for nonregular workers

remain largely unchanged even when controlling for labor market attachment and remaining tenure.

7.1 Introduction

An issue that in recent years has attracted growing attention in Japan is that although the share of women and nonregular employees in the workforce has increased, job training opportunities for them remain limited when compared to male and regular employees. Yet, as numerous studies have shown, job training and skill development play a central role in the formation of job skills and consequently are a key element underpinning wages (e.g., Kurosawa, 2001; Kawaguchi, 2006). Thus, as has been pointed out, the fact that so-called “marginal workers” such as women and nonregular employees receive little job training and skill development is an important reason for wage inequality.

To examine differences in the participation in job training by sex and employment status, Hara, Kurosawa, and Yamamoto (2009), for example, looked at employer-provided training for nonregular employees directly employed by firms on fixed-term contracts (part-time, casual, and contract workers) using the *Basic Survey of Human Resources Development* by the Ministry of Health, Labour and Welfare.¹ Among other things, they showed that even at the same workplace, there exist large differences between regular and nonregular employees in terms of the probability that they would attend off-the-job training courses and the time spent on training courses, and those differences are smaller at workplaces with well developed human resource management systems. Meanwhile, Kosugi and Kimura (2009), using, like the present study, the *2007 Employment Status Survey* by the Ministry of Internal Affairs and Communications, and focusing on the young, examined the relationship between their employment status and job career on the one hand and job

1 However, although the *Basic Survey of Human Resources Development* provides comprehensive information on job training and skill development in Japan, it suffers from a number of limitations. For example, the survey focuses only on private enterprises and establishments that employ 30 or more people on a regular basis. As a result, it covers less than one-tenth of all establishments and less than half of all employees. Moreover, the survey also does not include temporary workers (i.e., workers employed on a daily basis or for a determined period within a month who were employed for less than 18 days in either of the two months before the day of the implementation of the survey). Further, while the survey does ask firms and establishments questions on dispatched and workers, no information on individuals is available. Finally, the survey also does not include those not in employment.

skill development on the other. They found that the percentage of so-called “freeters” (job-hopping part-timers) that did any training provided by the employer or any self-development, i.e., pursued activities to improve their skills on their own, was much lower than that for regular employees.

These studies clearly illustrate the low rates of participation in job training by women and nonregular workers. The purpose of this study is to look at the reasons for this low participation rate from the perspective of economic theory by examining the patterns of employer-provided job training as well as self-development using microdata from the 2007 *Employment Status Survey*, which has a wider coverage of workers than the *Basic Survey of Human Resources Development*. Specifically, we estimate the probability that a worker did any training or self-development controlling for individual attributes and examine how this probability differs particularly for marginal workers (women, less-educated workers, and nonregular workers).

Standard human capital theory suggests that because job training represents investment in the future, important determinants of such investment are how much longer a given worker will remain in the labor market and how much longer that worker will continue to work for a specific firm. This is because the longer a worker is expected to remain in the labor market, the longer the payback period for any such investment in human capital will be. In addition, standard human capital theory also suggests that where, for technological reasons or because of market frictions, skills are firm-specific, the costs involved in human capital investment will be paid by firms or shared between firms and employees in the form of lower wages (see, e.g., Acemoglu and Pischke 1998, 1999). Under these circumstances, firms are likely to invest more in employees that are expected to stay at the firm for a longer time.

These predictions of human capital theory are well known, but empirical investigations of these issues are scarce. An important reason for this is that it is difficult to gauge future expectations from existing data sources. One notable example is Royalty (1996), who used the panel data of the *National Longitudinal Survey of Youth 1979* of the United States to estimate job-to-job and job-to-nonemployment turnover probabilities and showed that the estimated probabilities provide a good explanation of the probability of receiving training. In this paper, we take a somewhat similar approach, although we have to rely on cross-section data. What we do is to calculate the

“attachment index” for each worker, that is, how much time each worker can be expected to spend in the labor market until retirement by adding up the average working time until the standard retirement age for each of the worker’s attributes. In addition, we similarly calculate each worker’s expected “remaining tenure,” that is, how many more years each worker can be expected to continue to work at the current firm. Greater attachment to the labor market as a whole implies a longer payoff period for investment in general human capital and we would therefore expect this to be associated with more job training initiated by both employers and workers themselves. On the other hand, because longer remaining tenure implies a longer payoff period for firm-specific human capital investment, we would expect this to be associated with more job training initiated mainly by employers. In order to test these hypotheses, we examine to what extent these indicators proxying the length of the payoff period of investment explain differences in job training participation by sex and by employment status.

The main conclusions of our analysis are as follows. First, when we hold workers’ age, size of employer (measured in terms of the number of employees), tenure, industry, and occupation fixed, the job training probabilities for women, the less educated, and nonregular workers are smaller than for the respective reference groups. The difference is particularly large for employer-provided training. On the other hand, with regard to self-development, there is almost no difference by sex, and differences by workers’ age and size of employer are also small. Moreover, differences in job training probabilities for employer-provided training by educational attainment and employment status are greater among the young.

Second, whereas differences in the expected degree of workers’ labor market attachment (i.e., the predicted future employment period overall) affect participation in both employer-provided training and training initiated by workers themselves (self-development), differences in remaining tenure (i.e., the predicted future employment period at a particular firm) mainly affect participation in employer-provided job training.

Third, expected labor market attachment and expected remaining tenure, i.e., the proxy variables for the payoff period of human capital investment, explain more than half of the difference between men and women in the probability of participation in employer-provided training. In

contrast, these proxy variables explain very little of the difference in training probabilities between regular and nonregular workers. These results suggest that a considerable part of the difference in job training participation between men and women is due to differences in the length of the payoff period of investment, but the differences in job training participation between regular and nonregular workers arise largely because the type of work they are engaged in differs and there are fundamental differences between the two groups in the quality and quantity of required human capital accumulation.

The remainder of this study is organized as follows. In Section 7.2, we outline the data we use and start our analysis by presenting the ratios of workers involved in training (employer-provided and self-development) for each worker attribute based on an aggregation of our microdata. In Section 7.3, we then estimate training probabilities controlling for worker attributes. Next, in Section 7.4, we test various hypotheses regarding the relationship between labor market attachment and remaining tenure on the one hand and job training on the other and look at the extent to which this influences the training probabilities for marginal workers. Section 7.5 concludes.

7.2 Data and basic patterns

The source of our data is the 2007 *Employment Status Survey*, which surveys job training and self-development useful for work conducted in the preceding one year. Distinguishing between whether training was conducted at the initiative of the employer or the worker himself, it provides a breakdown of such training into the following categories: (a) training at the workplace (this category applies only to employer-provided training); (b) attendance of college or graduate school courses; (c) attendance of courses at a special training school or other vocational school; (d) attendance of courses at a public occupational skills development facility; (e) attendance of short courses or seminars; (f) participation in study group meetings or workshops; (g) taking distance learning courses; (h) self-learning (this category applies only to self-development), and (i) other. In this study, we will refer to training initiated by the employer as “employer-provided training” and training initiated by the worker as “self-development.”

To start with, we calculate the training ratios by workers’ attributes. We limit our sample to

those aged 15-59 and exclude those enrolled in full-time education. Moreover, we exclude from all occupied persons company executives, the self-employed (with or without employees), family workers, and those doing piecework at home, because their work status is somewhat different in nature from the concept of a “worker” we focus on here. As for those not in employment, we only include those wishing to work. Furthermore, we exclude observations for individuals where we think there are recording errors.² We then calculate the training ratio for each of a number of aggregate categories, distinguishing by sex, age group, educational attainment, etc.³ We do so for a sample consisting of occupied persons and those not in employment but wishing to work as well as a subsample consisting only of occupied persons, and for the latter calculate training ratios for additional aggregate categories, distinguishing by industry, occupation, size of employer (measured in terms of the number of employees) and tenure.

Table 7.1 shows, for the comprehensive sample consisting of occupied persons and those not in employment but wishing to work, the training ratio by sex, employment status, educational attainment, and age bracket in five-year intervals. As Table 7.1 indicates, the job training ratio for women is about 10 percentage points lower than that for men, and this difference is mainly due to differences in participation in employer-provided training. The training ratios for nonregular employees are lower than those for regular employees, with the difference being more pronounced for employer-provided training. Because the ratio of those not in employment receiving employer-provided training is, for obvious reasons, very low, the job training ratio for this group is also very low. Nevertheless, a closer look shows that when it comes to self-development, the ratio is higher than that for part-time and casual workers and not that different from dispatched workers. Looking at educational attainment, both the employer-provided training ratio and the self-development ratio increase with the level of education, and the size of the discrepancies between the different groups is quite striking. Next, by age group, we find that the training ratio

2 For example, cases where the years of tenure are greater than 45, the age at which the present job was taken up is less than 15, etc.

3 For the calculation, we use the simple number of observations for occupied persons plus those not in employment but wishing to work, occupied persons only, as well as for each aggregate category. The training ratios for each category as well as the average age and tenure are calculated as weighted averages.

overall is highest for those in their 20s and early 30s and then gradually declines with age. However, taking a closer look, we find that with regard to employer-provided training, the ratio is highest, at 35.8 percent, for those in their early 20s and then declines, but it remains stable at around 30 percent for those in their 30s to early 50s, pointing at a pattern in which employed workers continuously receive employer-provided training. On the other hand, self-development peaks at around 25 percent for those in their late 20s, then remains stable at around 20 percent for those in their 30s and 40s, and then declines again for those in their 50s.

Next, Table 7.2 shows the training ratios for occupied persons only, considering additionally training ratios by industry (broken down into 16 broad industry categories), by occupation (broken down into 10 broad occupational categories), by size of employer (in terms of number of employees), and by years of tenure in five-year brackets. Although the gap between women and men is somewhat smaller than in Table 7.1, the overall pattern for sex, employment status, education, and age group remains virtually unchanged by focusing on occupied persons only. By industry, the highest ratios can be found in the education and learning support sector; moreover, employer-provided training is particularly widespread in finance and insurance as well as electricity, gas, heat supply, and water, while self-development is especially common in medical, health care and welfare as well as information and communications. By occupation, the overall ratio is high for specialist and technical occupations as well as administrative and managerial occupations, with employer-provided training especially widespread in administrative and managerial occupations and self-development especially widespread in specialist and technical occupations. By size of employer, the larger the employer, the higher is the training ratio. Although this applies to both types of training, the pattern is particularly pronounced for employer-provided training. The highest ratios, though, are found for those working at government offices.

Finally, looking at the role of tenure, contrary to our expectation that investment in job training would concentrate on those with a shorter tenure, we find that the longer workers have been working for their current employer, the higher is the ratio of those doing any training, with a peak of about 50 percent for those with a tenure of 25-29 years. We suspect that this reflects increased training for career development within firms, such as in the form of management training programs,

as is indicated by the different patterns for employer-provided training and self-development, with the latter being relatively stable at around 20 percent and showing comparatively little variation across tenure groups. Overall, the patterns with regard to training ratios for the different aggregate categories by sex, age group, education, or employment status confirm once again that training ratios for marginal workers (women, nonregular workers, and the less educated) are low.

7.4 Estimation of training probabilities

Next, using probit estimation, we examine the probability that workers will do any employer-provided training or self-development, controlling for the attributes discussed in Section 7.2. To begin with, we use the pooled sample consisting of occupied persons and those not in employment but wishing to work in order to discover to what extent being in employment affects training probabilities. In the next step, we then confine our sample to occupied persons only to examine how workplace attributes such as industry, occupation, and employer size affect training probabilities.⁴

Starting with the pooled sample, we use as dependent variables of our probit estimation whether a person received employer-provided training or not and whether a person engaged in any self-development or not. As explanatory variables, we include a female dummy, employment status dummies (setting regular employees as the reference group), education dummies (with high school graduates as the reference group), and dummies for five-year age brackets (with 20-24 year-olds as the reference group). Table 7.3 shows the estimation results. In contrast with Tables 7.1 and 7.2, where the training ratio for women was lower than that for men, here we find that the probability of receiving employer-provided training is actually higher for women, and this difference is statistically significant. For self-development, the coefficient is even larger and indicates that the probability of this kind of training is 2.6 percentage points higher for women than for men.

Turning to the employment status, we find that the training probabilities for nonregular workers are lower than those for regular workers, and the difference is larger for employer-provided training than for self-development. Among nonregular workers, the probabilities are lowest for part-time

4 For basic statistics of the variables, refer to Appendix Tables 1(a) and 1(b).

and casual workers. For example, the probability of receiving employer-provided training is roughly 20 percentage points lower for such workers than for regular employees. For contract employees, the gap vis-à-vis regular employees is roughly half the size of that of part-time and casual workers (8 percentage points). As for those not in employment, it is only natural that their probability of receiving employer-provided training is very small: it is 30 percentage points below that for regular employees. On the other hand, when it comes to self-improvement, the gap vis-à-vis regular workers for those not in employment is only 3 percentage points, which is a smaller gap than that for part-time and casual workers and for dispatched workers. It could be said that this shows that those not in employment but wishing to work engage in self-development to improve their employability.

Turning to the effects of educational attainment, we find that even when we hold other factors fixed, the training probabilities of the highly educated are very high both with regard to employer-provided training and self-development. This is a phenomenon already well documented in previous research on Japan, the United States, Germany, and other countries. As highlighted by Altonji and Spletzer (1991), it can be interpreted as suggesting that because for those with greater learning ability the rate of return to education and job training is higher, there is a positive correlation between years of education and receiving job training. In addition, we find that differences in training probability by educational attainment are more pronounced for self-development than for employer-provided training.

Looking at the role of age, the results generally indicate that the younger workers are, the more likely they are to receive training. However, that probability does not decline monotonically with age, and for employer-provided training the probability is actually highest for those in their 40s and early 50s. For self-development, the probability declines with age from the 40s onward.

Next, limiting our sample to occupied persons and using the same dependent variables as above, we conduct the same estimation but in addition to the female dummy and the employment status, education, and age group dummies, we also include employer size (using workers working for firms with 1-9 employees as the reference group) and tenure, i.e., the number of years a worker has worked for the present employer (using 0-4 years as the reference group). The estimation results are

presented in Table 7.4, with column (2) showing the results when the dummies to control for industry (major classification, 16 industries), column (3) showing those when the dummies to control for occupation (major classification, 10 occupations), and column (4) showing those when both sets of dummies are included.

Starting again by looking at the female dummy, we find that for employer-provided training, the coefficient is positive when the industry and occupation dummies are not included, but becomes negative when they are. Especially controlling for industry has a large impact on the coefficient. This indicates that it is likely that women tend to work in industries where the probability of receiving training is high. On the other hand, when it comes to self-development, there are almost no differences between men and women once industry and occupation are controlled for. As for the employment status, the probability of receiving employer-provided training is lower for nonregular than for regular employees, but when it comes to self-development, the differences by employment status are much smaller. Next, looking at the role of education, we find that the higher the educational attainment, the higher is the training probability. However, when the industry and occupation dummies are included, that difference becomes considerably smaller. This means that more highly educated workers are more likely to work in industries and occupations where the training probability is high. Moreover, the differences by educational attainment are larger for self-development than employer-provided training. This suggests that, as mentioned earlier, it is likely that the return on learning a new skill is higher for the more educated. Looking at the effect of age, while the probability of employer-provided training decreases with age from the late 20s onward, for self-development no significant differences can be observed until the early 40s.

Turning to the role of employer size, the results indicate that the larger the employer, the higher is the training probability. The probability of receiving employer-provided training is about 30 percentage points higher for workers at firms with more than 1,000 employees or at government offices than for workers at firms with fewer than 10 employees. However, with regard to self-development, differences by employer size are quite small. Next, looking at tenure, the probability of employer-provided training increases with tenure and reaches a peak in the neighborhood of 30-39 years. This is a finding that differs from our theoretical expectation and

implies that workers receive continuous employer-provided training as part of a process of career development with length of service. The fact that this pattern can also be found in the estimation including the occupation dummies and hence a dummy for administrative and managerial occupations suggests that this employer-provided training for career development continues to take place across occupations.⁵ On the other hand, the longer workers' tenure, the less likely it is that they engage in self-development.

Summarizing these findings, we can say that the training probabilities of women, less educated workers, and nonregular workers are still lower when controlling for age, employer size, tenure, industry, and occupation. The differences are particularly large when it comes to employer-provided training. And comparing the results for these groups of marginal workers, the disadvantage is largest for nonregular workers. On the other hand, when it comes to self-development, there is almost no difference between the sexes, while differences by age or size of employer are also small. Taken together, these results suggest that the probability of receiving employer-provided training is noticeably smaller for women, those at small firms, those not in employment, and nonregular employees, though on the other hand it seems that women and those employed at small firms compensate for this by pursuing self-development. In contrast, the difference between the less educated and the better educated is even greater for self-development than for employer-provided training.

To examine the relatively large differences in employer-provided training probabilities by sex, employment status, and education in greater detail, we additionally estimate the coefficients separately for each age group (Appendix Table 7.2). Doing so, we find that for women, the negative estimated value is largest for those in their 30s. With regard to education, the positive value for the highly educated becomes more pronounced for the young. And with regard to the employment status, we find that for part-time and casual workers and for dispatched workers, the negative estimated values are especially large for those in their 20s. These results indicate that differences in training probability by educational attainment and employment status are more pronounced among

⁵ Pischke (2001) arrives at a similar finding regarding this kind of continuous training, showing that in Germany training remains high for workers into their 40s.]