Analysis on the Acquisition of Vocational Certifications and Their Effectiveness in Japan*

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This paper examines and analyzes the status of professional licenses, authorizations, and certifications[1] held and their effectiveness in the labor market, based on data collected through a web survey method from current job holders. We believe that our study is unparalleled in its comprehensiveness and inclusiveness. We found that certifications are acquired mostly by people in their 20s and mainly as a means to develop professional skills early in the career formation process. As for the effectiveness of certifications in the labor market, we recognized positive effects on the employment of people with a secondary education who were regular workers. We also found that, although the possession of certifications does not automatically lead to higher income, women holding certifications that are useful in helping them acquire a job or perform their job duties earn relatively high incomes. On the other hand, when men hold certifications that are useful in helping them acquire a job early in the career formation process, it leads to a relatively high income. In the future, it will be necessary to conduct a more thorough study on the significance of certifications by analyzing their substance in detail and examining the assessment of the effectiveness of certifications by employers. It will also be important to develop a database of information related to certifications as part of an information infrastructure for workers' career formation.

I. Introduction

Vocational certifications available in Japan are diverse in terms of function[2] and in

* This paper was written on the basis of JILPT Research Report No. 121 "Analysis of Vocational Certifications in Japan: In Light of the Findings of a Web Survey on Certifications," which described the findings of an analysis conducted by the Japan Institute for Labour Policy and Training (JILPT). That report was co-authored by Osamu Yoshida (Project researcher, JILPT) , Junpei Matsumoto (Project researcher, JILPT), Kimiko Nishimura (research director, JILPT), Shinsaku Matsumoto (assistant research director, JILPT), Chihiro Iwawaki (researcher, JILPT), Tetsushi Kamakura (Research assistant, JILPT), Mai Sato (Research assistant, JILPT), and Kenji Agata (associate professor, Department of Industrial Relations, Faculty of Social Studies, Doshisha University). In addition to the subject matter of this paper, the report analyzed the possession of certifications by occupation and the state of occupational fields where the information infrastructure is underdeveloped. Moreover, regarding each of the 227 certifications which were held by at least 50 respondents, the report specified the jobs in which the holders of the relevant certifications are engaging, the degree of usefulness for the acquisition of a job and the performance of job duties, the period of time necessary for acquisition, the age of acquisition and the job concentration.

1 The certifications as referred to in this paper are those granted by the national government or third-party entities, including private certifying organizations, and they do not include internal certifications granted by companies. Hereinafter, they shall be collectively referred to as "certifications."

2 Certifications classified by function include those without which workers are not allowed to perform a relevant job, certifications which must be held by at least one worker when the relevant busi-

terms of the issuing and certifying entities. Estimates of the number of vocational certifications available in Japan ranges from upwards of 1,000 to 3,000 and beyond.

The acquisition of certifications has been noted for its effectiveness as a goal striven for in the career formation process and a means for the development of professional skills: for example, Ono (1998) and Sunada and Kimura (1996) referred to the effectiveness of certifications as a "motivation for learning to achieve career goals" while and Imano and Shimoda (1995) mentioned their effectiveness as "a means for proactive career formation and a preparation for acquiring practical skills." Fujimura (2000) referred to the usefulness of certifications for workers to "better understand their work by acquiring a body of theory through practical work experience." Likewise, some 80% of regular workers recognized the necessity of certifications (as represented by the combined ratio of regular workers who replied that it was definitely necessary to hold some manner of certification and those who replied that holding some manner of certification was preferable to not holding any) (Ministry of Health, Labour and Welfare, 2008, "Comprehensive Survey on the Diversification of Employment Arrangements").

On the other hand, some studies cast doubt on the effectiveness of the possession of certifications, based on such arguments as that they "do not necessarily indicate the possession of the ability to perform job duties" (Yahata 1999) and that they "tend to be not so useful for individual workers on the occasion of job matching as expected by themselves" (Okubo 2006).

The divergence in the assessment of the effectiveness of the possession of certifications derives from a lack of comprehensive and objective analysis on the relationship between jobs and certifications, as well as difference in the perspective on the effectiveness. The lack of such analysis is due to the difficulty involved in collecting and sorting diverse and complicated information related to certifications.

In light of the above, we have sorted and analyzed a vast volume of data related to jobs and certifications, which was collected through a web survey method. Arguably, this is the first study to show, objectively based on data, how people acquire certifications and what benefits the possession of certifications brings about in Japan.

II. Survey Method and Data Collection

1. Survey Method

Through a web survey system developed specifically for the implementation of our survey, we asked web survey respondents registered with a survey company (a total of approximately 1.41 million people are registered) first about their current jobs and then about their certifications, attributes, etc. The survey subjects were current job holders. The survey

ness activities are being executed, certifications whose name is prohibited under law from being used to refer to persons other than the certification holders, and other certifications that serve merely as proof of the possession of relevant skills.

was conducted twice, in 2008 and 2009.

2008 Survey

Survey period: February 25 to March 6, 2008

Sampling: The questionnaire was sent to registered survey respondents with the goal of collecting 50 samples for each job type, and the survey was ended when the total number of samples collected reached 26,000 workers.

Question Items:

- Q1 Description of your current job
- Q2 Length of employment
- Q3 Job duties
- Q4 Certifications currently held and your assessment thereof (up to 10 certifications)
- Q5 Education and training necessary for acquiring your current job
- Q6 Last school attended
- Q7 Last two jobs held prior to your current job and your assessment thereof
- Q8 Annual income from your current job
- Q9 Attributes of the respondent (age, gender, job rank, form of employment, etc.)

In Q4, respondents were asked to choose the certifications that they hold from a list of 1,017 certifications and give a reply as to (i) the degree of their necessity for acquiring their current jobs (essential, advantageous, or irrelevant) and (ii) the degree of their usefulness for performing their current jobs (very useful, useful, or not useful). Each respondent was able to choose up to 10 certifications and was asked to give a reply as to (i) and (ii) regarding each certification he or she held.

Number of samples collected: 26,119 workers

2009 Survey

Survey period: February 12 to March 5, 2009

Sampling: An e-mail questionnaire was sent to registered survey respondents other than those who had replied to the 2008 survey, and the survey was ended when the number of samples collected, including the ones collected in the 2008 survey, reached 100 workers for each job type and the total number of samples reached 27,000 workers.

Question items: In addition to the questions asked in the 2008 survey under Q4, respondents were asked to give a reply as to (iii) their ages upon acquisition of the certifications (age range) and (iv) the period of time necessary for them to acquire the certifications (include the period of school attended if it is necessary). Moreover, company size, number of years worked and form of employment were added to the attributes of the respondent that were inquired about in Q9. The list of certifications to choose from was expanded to 1,153 certifications based on data obtained through the 2008 survey.

Number of samples collected: 27,014 workers

Table 1. Respondents by Gender and Age Group

	Under 20	20s	30s	40s	50s	60s or older	No reply	Total
Men	30	4,233	14,917	12,029	3,998	762	38	36,007
	0.1%	11.8%	41.4%	33.4%	11.1%	2.1%	0.1%	100.0%
Women	26	4,334	7,769	3,860	960	161	16	17,126
	0.2%	25.3%	45.4%	22.5%	5.6%	0.9%	0.1%	100.0%
Total	56	8,567	22,686	15,889	4,958	923	54	53,133
	0.1%	16.1%	42.7%	29.9%	9.3%	1.7%	0.1%	100.0%

Table 2. Respondents' Academic Attainment, Annual Income and Form of Employment

	Number of samples (%)		Number of samples (%)
Academic Attainment		**Annual Income**	
Junior high school	563 (1.1)	Less than ¥500,000	1,737 (3.3)
Senior high school	13,588 (25.6)	¥500,000 to ¥1 million	2,658 (5.0)
Professional training colleges	7,719 (14.5)	¥1 million to ¥1.5 million	2,824 (5.3)
Junior colleges /technical colleges	4,605 (8.7)	¥1.5 million to ¥2 million	2,907 (5.5)
Universities (liberal arts)	13,593 (25.6)	¥2 million to ¥2.5 million	3,825 (7.2)
Universities (sciences)	8,277 (15.6)	¥2.5 million to ¥3 million	4,591 (8.6)
Graduate schools	4,788 (9.0)	¥3 million to ¥4 million	8,158 (15.4)
Total	53,133 (100)	¥4 million to ¥5 million	7,591 (14.3)
Form of Employment (only in the 2009 survey)		¥5 million to ¥ 6 million	6,106 (11.5)
Regular workers	18,783 (69.5)	¥6 million to ¥7 million	3,872 (7.3)
Part-time workers	1,717 (6.4)	¥7 million to ¥8 million	2,813 (5.3)
Part-time workers with reduced benefits (*arubaito*)	1,181 (4.4)	¥8 million to ¥9 million	1,776 (3.3)
		¥9 million to ¥10 million	1,313 (2.5)
Temporary workers	789 (2.9)	¥10 million to ¥12 million	1,470 (2.8)
Contract workers	1,231 (4.6)	¥12 million to ¥15 million	682 (1.3)
Commissioned workers	388 (1.4)	¥15 million to ¥20 million	399 (0.8)
Others	2,925 (10.8)	¥20 million or higher	411 (0.8)
Total	2,7014 (100)	Total	53,133 (100)

2. Key Points of Collected Data

(1) Respondents

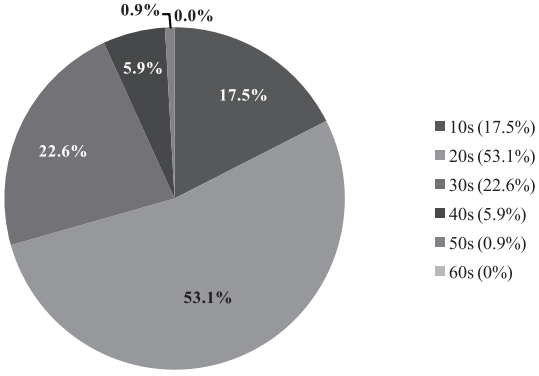
The total number of respondents in these two surveys came to 53,133. By gender, men accounted for 67.8% of the total, while by age group, people in their 30s and 40s made up 72.6% (Table 1). By academic attainment, university graduates accounted for 41.1% and by annual income, 41.1% were people who earned between ¥3 million and ¥6 million. By form of employment (an item inquired about only in the 2009 survey), 69.5% were regular workers. (Table 2)

(2) Certifications

Of all respondents, totaling 53,133, 55.7% held at least one certification. Respondents who held only one certification made up 46.7% of the certification holders (26.0% of all respondents). The number of certifications that were held by at least one respondent stood at

Table 3. Status of Certifications Held

Possession of certification by respondents (number of holders)		Number of certifications	
Certificate holders	29,577 (55.7%)		
One certification	13,803 (26.0%)	Held by at least 100 respondents	147
Two certifications	7,770 (14.6%)	Held by 50 to 99 respondents	84
Three or more	8,004 (15.6%)	Held by 1 to 49 respondents	803
No certification	23,556 (44.3%)		
Total number of respondents	53,133 (100.0%)	Total number of certifications	1,034



(N=31,305 People, or the Total Number of Respondents with Certifications That Were Held by at Least 50 Respondents)

Figure 1. Age of Certification Acquisition

1,034. Of that number, 147 were held by at least 100 respondents and 84 by between 50 and 99 respondents (Table 3).

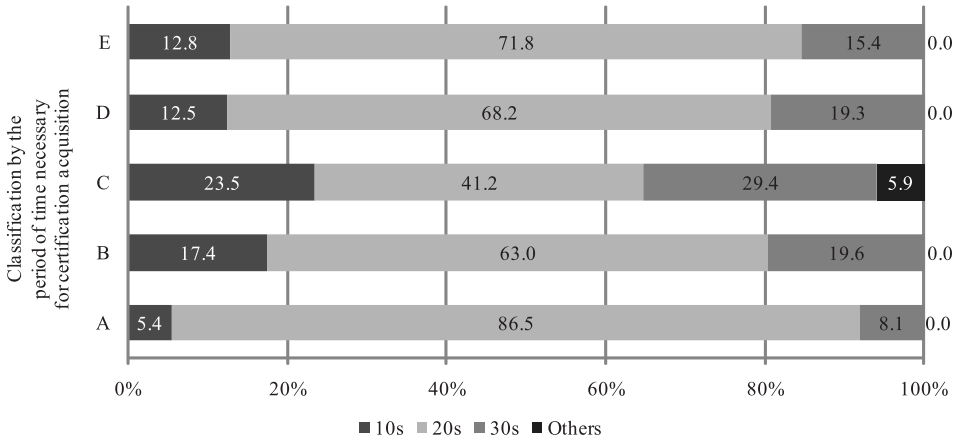
III. Status of Certifications Held

This section shows the results of the analysis conducted on the 227 certifications[3] that were held by at least 50 respondents (the total number of certification holders at 31,305).

1. Age of Certification Acquisition

The majority, 53.1%, acquired the relevant certificates in their 20s, 22.6% in their 30s, and 17.5% in their teens (Figure 1).

[3]Although 231 of all certifications on the list were held by at least by 50 workers, 227 certifications were analyzed, since the five certifications related to the operation of small vessels for which the requirements for acquisition changed between the 2008 and 2009 surveys, were treated as one.



Notes: 1. Certifications were divided by the period of time necessary for certification acquisition into Class A (with a peak period for acquisition, in terms of the percentage of certificate holders who acquired the certificate, of three years or longer), Class B (with a peak period for acquisition of one to three years), Class C (with a peak period for acquisition of six months to one year), Class D (with a peak period for acquisition of one to six months) and Class E (with a peak period for acquisition of less than one month).

2. The "peak age category of acquisition" refers to an age category in which the largest proportion of holders of a given certification acquired the certification.

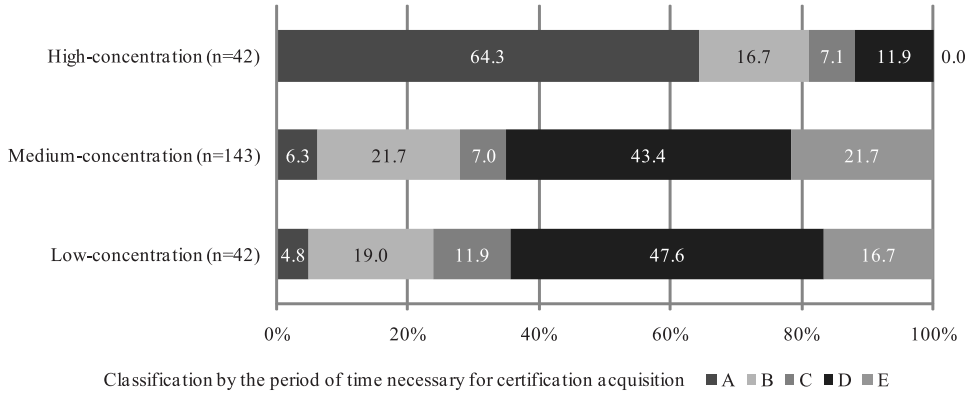
Figure 2. Shares of Peak Age Categories of Acquisition by the Period of Time Necessary for Acquisition

A look at the shares of peak age categories of acquisition[4] by the class of certifications divided by the period of time necessary for certification acquisition (Figure 2) shows that the share of the 20s category was the largest for all classes, and that these certifications were acquired at the beginning of the subjects' careers. In particular, in Class A, which comprised certifications for which the peak period for acquisition, in terms of the percentage of certificate holders who acquired the certificate, was three years or more and in Class E, which comprised those for which the peak period for acquisition was less than one month, the 20s category accounted for by far the largest shares, 86.5% in the case of Class A and 71.8% in the case of Class E. When in their 20s, people acquire a wide range of certifications, from those which require a long period of learning, including formal education, to those which can be acquired in a short period of time, and their career formation is affected accordingly.

2. Job Concentration by Certification

One of the benefits expected to be brought about by the acquisition of a certification

[4] For the definition of the "peak age category of acquisition," see Figure 2, Note 2.



Notes: 1. In order to simplify the classification, certifications for which there were two or more peak periods of acquisition were categorized into the class with the longest peak period.

2. For an explanation of classification by the period of time necessary for certification acquisition, see Note 1 of Figure 2.

Figure 3. Shares of the Classes of Certifications Divided by the Period of Time Necessary for Certification Acquisition by the Degree of Job Concentration

is a positive effect on the acquisition of a job. If holders of a certain certification are concentrated in a certain type of job, that certification is presumed to be effective in helping its holders acquire that type of job. In light of this, we will look at the state of job concentration by certification. Job concentration means the degree to which people holding a given certification are dispersed into a number of job types. The number of job types in which people holding a given certification would be engaged if 1,000 people held that certification (the "job concentration index," below), is calculated by: [(number of types of job in which the holders of the certification are engaging / number of the certification holders) × 1000]. Depending on the distribution of this value, the degree to which people holding the certification are concentrated in a given job is classified into a high, medium, or low-concentration group.[5] The average value of the job concentration indexes for the certifications which were held by at least 50 respondents came to 477.5 (SD＝228.7), indicating that if each of those certifications were to be held by 1,000 people, the people who held them would, on average, be engaging in a broad range of about 478 types of jobs.

A look at the relationship between the status of job concentration and the period of time necessary for certification acquisition (Figure 3) shows that of the certifications in the

[5] A high job concentration means that holders of the relevant certification are engaged in a small number of job types and are concentrated in these types of jobs. A low job concentration means that holders of the relevant certification are engaged in a large number of job types and are dispersed among these various job types. The value "z" was calculated as = (job concentration index of a given certification – average job concentration index for the 227 certifications) / standard deviation. Job concentrations were categorized as "high" ($z < -1$), "medium" ($-1 \leqq z \leqq 1$), or "low" ($z > 1$).

high-concentration group, Class A, which comprises certifications requiring a long period of time for acquisition (a peak period for acquisition of three years or longer), accounted for 64.3%. Meanwhile, of the certifications in the medium- and low-concentration groups, Class D, which comprises certifications requiring a relatively short period of time for acquisition (a peak period for acquisition of one month to half a year), accounted for the largest shares, 43.4% and 47.6%, respectively. These findings are evidence that as a long period of time is usually necessary for the acquisition of certifications for which job concentration is high, workers seek to recover the high costs of the certification acquisition (in terms of time, money, and opportunity costs) by engaging in types of jobs that take advantage of the relevant certification. However, as some certifications in Class A are categorized into the low- or medium-concentration groups, we will conduct a further study on the relationship between the period of time necessary for certification acquisition and the state of job concentration in the next section.

IV. Study on the Effectiveness of Certification in the Labor Market

1. Cost-Benefit Analysis in Relation to Job Acquisition

As the acquisition of certifications involves various costs, it is essential to conduct a cost-benefit analysis when deciding whether or not to acquire a certain certification. In the following analysis, the cost is represented by the period of time necessary for certification acquisition. This is because the longer the period of learning for certification acquisition is, the larger the necessary financial and opportunity costs are and the more time needs to be spent. To be more specific, the cost of certification acquisition is represented by the certification acquisition difficulty index, which is calculated by weight-averaging the number of days necessary for acquisition. The benefit is represented by the effectiveness of a certificate in helping the holder to acquire a job and to perform his/her job duties. The analysis covered the 147 certifications that were held by at least 100 respondents.[6]

Table 4 shows the 20 most challenging certifications in terms of the acquisition difficulty index (as measured by the period of time necessary for acquisition) and the profiles of certification holders. For 15 of the 20 certifications, more than 60% of certification holders were engaging in jobs to which their certifications were relevant. For many of the certifications, more than 70% of certificate holders regarded the certification as essential to their obtainment of their current jobs, and more than 60% regarded the certification as very useful to their performance of their job duties, suggesting that the cost spent on certification acquisition was rewarded with positive effects produced on the acquisition of a relevant job and the performance of job duties. These rewarding certifications were invariably related to

[6] While the analysis covered the 147 certifications that were held by a total of at least 100 respondents in the 2008 and 2009 surveys, the period of time necessary for acquisition was inquired about only in the 2009 survey. Accordingly, the acquisition difficulty index, the attributes of respondents, the effectiveness of certification, etc. in Table 4 relate to the 2009 survey.

medical care. Meanwhile, for certifications related to education, which were mostly held by university graduates with liberal arts degrees, the high cost of certification acquisition was not rewarded with positive effects on job acquisition or job performance; the percentage of certification holders engaging in education-related jobs was low, at 15% to 30%, and consequently, the percentage of people who recognized a positive effect on job acquisition and job performance was also low, at 20% to 40%.

Certifications with the greatest cost-effectiveness are those which require a short period of time for acquisition but which are useful to their holders in the acquisition of a job and the performance of job duties. Most of such certifications are national certifications that are mandatory for the operation of specific types of vehicles and machinery, including cranes, forklifts, and large automobiles. This confirms that the acquisition of legally-sanctioned certifications is advantageous for the acquisition of a job and the performance of job duties, even though their acquisition difficulty index (as measured by the period of time necessary for acquisition) is low. It may also be said that cost-effective licenses for the operation of machinery and vehicles have something in common with certifications that are related to medical care, which are effective in facilitating job acquisition, in that both of them concern the assurance of health and physical safety.

2. Benefits to Income and Job Rank

This section examines the benefits of certification acquisition to improvements in the holders' conditions of employment. Among the notable features of the labor market in Japan are the facts that the wage gap between men and women is wide by international standards, and that the proportion of women among non-regular workers is large. In light of these features, we conducted a multilinear/logistic regression analysis as to whether the acquisition of the 147 certifications that were held by at least 100 workers had an effect on increasing the income of female workers and resulting in women working as regular workers. The analysis found that the possession of certifications had a negative effect on the income of female workers, while it had a positive effect on people with secondary educations working as regular workers (Tables 5 and 6). Meanwhile, our logistic regression analysis of the impact of certification acquisition on women working as regular workers did not recognize a statistically significant effect between certificate holders and non-holders, although the partial regression coefficient "B" was a positive figure.

As shown above, while the possession of certifications has a positive effect on people with secondary educations working as regular workers, it does not automatically lead to women's higher income nor do its positive effects significantly result in women working as regular workers. It should be noted for the negative effects of the possession of the above-mentioned 147 certifications on women's income, that no such negative effect is seen at a significance level of 5% if the data on samples in the highest income bracket of ¥20 million or higher are excluded. The findings of the multilinear regression analysis were presumably skewed by data on high-income women without any certifications.

Table 4. The 20 Most Challenging Certifications in Terms of the Acquisition and the Profiles of Certification Holders

	Rank / Certification	Number of holders 2009 (2008+2009)		Acquisition difficulty index	Ratio of women (%)	Predominant last school attended (%)
1	Veterinarian	73	(128)	1681	**31.5**	University science program (60.3)
2	Medical doctor	268	(511)	1671	20.5	University science program (61.2)
3	Dentist	62	(121)	1663	19.4	University science program (66.1)
4	Clinical psychologist	52	(108)	1182	**55.8**	Graduate school (80.8)
5	Physical therapist	74	(130)	1160	20.3	Professional training college (43.2)
6	Public health nurse	49	(104)	1153	**95.9**	University science program (36.7)
7	Elementary school teacher	228	(422)	1125	**55.7**	**University liberal arts program (69.3)**
8	Senior high school teacher	767	(1396)	1123	**42.2**	**University liberal arts program (47.7)**
9	General nurse	184	(359)	1090	**90.2**	Professional training college (59.2)
10	Pharmacist	164	(337)	1071	**34.8**	University science program (51.8)
11	Junior high school teacher	632	(1135)	1068	**51.4**	**University liberal arts program (49.5)**
12	Teacher for schools for physically and mentally handicapped children	52	(107)	1055	**51.9**	**University liberal arts program (75.0)**
13	Medical technician	116	(233)	1042	**65.5**	Professional training college (31.9)
14	Nationally certified dietician	64	(131)	1012	**85.9**	University science program (42.2)
15	Radiologist	65	(119)	992	20.0	Professional training college (44.6)
16	Massage therapist (moxibustion therapy)	83	(168)	974	18.1	Professional training college (45.8)
17	Massage therapist (acupuncture)	93	(181)	963	19.4	Professional training college (45.2)
18	Curator	129	(244)	931	**51.2**	University liberal arts course (48.1)
19	Prosthetist	54	(108)	891	7.4	Professional training college (51.9)
20	Massage therapist (massage and acupressure)	62	(124)	884	21.0	Professional training college (45.2)
Total for the holders of certifications which were held by at least 100 respondents		28103	(48386)	277	30.6	Senior high school (25.7)

Difficulty Index (as Measured by the Period of Time Necessary for Acquisition)

Average age (Standard deviation)		Peak age category of acquisition (%)	Degree of necessity for job acquisition (%)		Usefulness to job performance (%)	Peak period of preparation (%)	Ratio of workers engaging in relevant jobs (%)
			Essential	Advantageous			
41.8	(12.2)	20s (93.2)	**65.8**	**28.8**	**65.8**	5 yrs or longer (79.5)	**73.9**
40.6	(8.1)	20s (94.4)	**88.1**	10.1	**89.6**	5 yrs or longer (86.9)	**94.7**
42.9	(8.6)	20s (90.3)	**87.1**	11.3	**90.3**	5 yrs or longer (90.3)	**92.0**
37.3	(7.8)	20s (61.5)	**48.1**	**40.4**	**53.8**	5 yrs or longer (34.6)	**82.5**
34.3	(6.4)	20s (79.7)	**86.5**	9.5	**81.1**	3 to 4 yrs (52.7)	**85.2**
34.2	(8.2)	20s (89.8)	**67.3**	18.4	**61.2**	4 to 5 yrs (44.9)	**87.7**
40.6	(8.5)	20s (93.4)	**44.7**	27.4	**40.3**	4 to 5 yrs (36.7)	39.0
40.1	(9.0)	20s (96.1)	22.4	24.5	21.9	3 to 4 yrs (47.8)	15.3
35.9	(7.0)	20s (89.1)	**78.3**	13.6	**83.2**	3 to 4 yrs (54.3)	**69.1**
37.7	(8.1)	20s (95.1)	**37.8**	**38.4**	**37.8**	4 to 5 yrs (47.0)	**62.7**
40.2	(8.6)	20s (95.1)	22.0	27.7	19.7	3 to 4 yrs (43.5)	19.3
42.1	(9.1)	20s (66.0)	**32.0**	**38.0**	**42.0**	3 to 4 yrs (38.0)	50.0
39.8	(9.2)	20s (95.7)	**62.9**	25.0	**60.3**	3 to 4 yrs (55.2)	**73.3**
35.1	(7.3)	20s (87.5)	**34.4**	**42.2**	**46.9**	4 to 5 yrs (45.3)	**62.7**
38.8	(7.9)	20s (90.8)	**86.2**	9.2	**86.2**	3 to 4 yrs (50.8)	**89.1**
40.6	(7.9)	20s (67.1)	**72.2**	24.1	**74.7**	3 to 4 yrs (68.4)	**91.6**
40.1	(7.9)	20s (65.2)	**70.7**	21.7	**79.3**	3 to 4 yrs (64.1)	**88.3**
37.0	(7.6)	20s (93.8)	20.2	24.8	20.2	3 to 4 yrs (37.2)	29.6
39.9	(8.5)	20s (72.2)	**79.6**	14.8	**79.6**	3 to 4 yrs (42.6)	**98.2**
40.5	(7.8)	20s (65.0)	**75.0**	23.3	**80.0**	3 to 4 yrs (53.3)	**87.2**
38.7	(8.5)	20s (53.6)	23.3	28.5	26.5	1 to 6 months (34.7)	

Table 5. Multilinear Regression Analysis Using Women's Income as a Dependent Variable

	Model 1			Model 2		
	B	S.E.	*p*	B	S.E.	*p*
Age	6.215	0.333	***	6.250	0.333	***
Academic attainment						
Junior and senior high school (dummy, baseline)						
Junior and professional training colleges (dummy)	20.423	6.881	**	21.471	6.878	**
University and graduate school (dummy)	111.525	6.876	***	113.42	6.882	***
Executive and managerial post (dummy)[1]	229.899	9.214	***	228.64	9.208	***
Company size[2]	-93.786	5.294	***	-94.591	5.291	***
Job type[3]	-30.005	6.068	***	-32.287	6.083	***
Job rank[4]	158.953	5.677	***	159.15	5.671	***
Certification held by at least 100 respondents (dummy)[5]				-23.317	5.302	***
Constant	-6.167	14.269		7.107	14.570	
r^2	0.250			0.251		
N	8576			8576		

Notes: 1. "Executive or managerial post" is a dummy variable with "executive post" and "managerial post" given the value 1 and others given the value 0.
2. "Company size" is a dummy variable with "99 employees or less" given the value 1 and "100 employees or more and government agencies, etc." given the value 0.
3. "Job type" is a dummy variable with "blue-collar job" given the value 1 and "white-collar job" given the value 0.
4. "Job rank" is a dummy variable with "regular worker" given the value 1 and "part-time workers, part-time workers with reduced benefits (*arubaito*), temporary agency workers, contract workers and commissioned workers" given the value 0.
5. "Certification held by at least 100 respondents (dummy)" is a dummy variable with workers holding certifications held by at least 100 respondents as defined in Chapter IVgiven the value 1 and workers holding no such certification given the value 0.
6. Significance probability: *** p<.001, ** p<.01, * p<.05.

Table 6. Logistic Regression Analysis Using Job Ranks of Regular and Irregular Workers with Secondary Educations as a Dependable Variable

	B	S.E.	Exp(B)	*p*
Gender[1]	1.998	0.071	7.372	***
Age	-0.027	0.004	0.973	***
Executive or managerial post (dummy)[2]	1.401	0.126	4.059	***
Company size[3]	0.412	0.067	1.509	***
Job type[4]	-0.025	0.067	0.975	
Certification held by at least 100 respondents (dummy)[5]	0.256	0.065	1.292	***
Constant	1.136	0.156	3.114	***
-2Log Likelihood	6759.345			
Cox & Snell Pseudo r^2	0.107			
N	10522			

Notes: 1. "Gender" is a dummy variable with "men" given the value 1 and "women" given the value 0.
2. "Executive or managerial post" is a dummy variable with "executive post" and "managerial post" given the value 1 and others given the value 0.
3. "Company size" is a dummy variable with "99 employees or less" given the value 1 and "100 employees or more and government agencies, etc." given the value 0.
4. "Job type" is a dummy variable with "blue-collar job" given the value 1 and "white-collar job" given the value 0.
5. "Certification held by at least 100 respondents (dummy)" is a dummy variable with workers holding certifications held by at least 100 respondents as defined in Chapter IV given the value 1 and workers holding no such certification given the value 0.
6. Siginificance probability: *** p<.001, ** p <.01, * p <.05.

As income level is affected by various factors other than the possession of certifications, such as gender, age, academic attainment, and occupation, further study was necessary. Therefore, we conducted five sets of AnswerTree analysis on income[7] covering (i) all respondents, (ii) men with high school education, (iii) men with university education, (iv) women with high school education, and (v) women with university education, by using six variables: (i) gender, (ii) age,[8] (iii) academic attainment,[9] (iv) job field,[10] (v) degree of necessity of the certification for job acquisition, and (vi) degree of usefulness of the certification to job performance.[11] The analysis covered data on all respondents in the 2008 and 2009 surveys, totaling 53,133 people. Table 7 shows the results of the AnswerTree analyses based on classification by gender and academic attainment for groups of samples for whom the possession of a certification was found to be the branching factor, and Figure 4 shows the results of the AnswerTree analysis for women with high school educations.

According to the AnswerTree analysis of the income of all respondents, the most influential factor was gender, followed by the factor of age for men, academic attainment for women, but possession of certifications, and the certifications' effectiveness in the attainment of a job and in the performance of job duties have no influence on the income. However, looking separately at gender and academic attainment, the evaluation of a certification as being effective in helping with the acquisition of a job or the performance of job duties was the branching factor of the first phase for female graduates of both high school and university, and it was therefore the greatest influence on income among these groups. The branching factor of the first phase for men was age for both high school and university graduates, and although the possession of certifications had less of an influence on income than it did for women, the effectiveness of a certification in helping with job attainment was the branching factor of the second phase for university graduates in their 20s and 30s and high school graduates in their 30s (Table 7).

The AnswerTree analysis for women with high school educations shows that those

[7] Points were awarded as follows: 1 point for less than ¥500,000; 2 points for ¥500,000 to ¥1M; 3 points for ¥1M to ¥1.5M; 4 points for ¥1.5M to ¥2M; 5 points for ¥2M to ¥2.5M; 6 points for ¥2.5M to ¥3M; 7 points for ¥3M to ¥4M; 8 points for ¥4M to ¥5M; 9 points for ¥5M to ¥ 6M; 10 points for ¥6M to ¥7M; 11 points for ¥7M to ¥8M; 12 points for ¥8M to ¥9M; 13 points for ¥9M to ¥10M; 14 points for ¥10M to ¥12M; 15 points for ¥12M to ¥15M; 16 points for ¥15M to ¥20M; and 17 points for ¥20M or higher.

[8] Divided into six age categories: under 20, 20s, 30s, 40s, 50s, and 60s or older.

[9] Divided into six groups: junior high school graduates; high school graduates; professional training college graduates; junior college and technical college graduates; university graduates; and graduate school graduates.

[10] Divided into 12 fields, each of which comprises jobs whose duties are of a similar nature.

[11] In addition, three other variables—company size, number of years worked, and form of employment— are also likely to affect income level. However, as data concerning these three variables are available only from the 2009 survey, they were excluded from our analysis, which covered the samples of both of the 2008 and 2009 surveys.

Table 7. Key Points of the Results of the AnswerTree Analysis

Gender	Men					Women			
Category	1st phase	2nd phase		3rd phase		1st phase		2nd phase	3rd phase
	Age group	Stage	Effectiveness	Stage	Effectiveness	Stage	Effectiveness	Stage	Age group
Hhigh school graduates	30s	Job acquisition	Necessary	Job performance	Neither useful nor useless Very useful	Job acquisition	Highly necessary		
							Necessary		
	50s	Transportation jobs		Job performance	Very useful				
		Construction jobs							
University graduates	20s	Job acquisition	Highly necessary			Job performance	Very useful	Professional/corporate services jobs	
	30s	Job acquisition	Highly necessary	Medical/health care jobs				Education/research jobs	30s or older
				Transportation jobs				Jobs related to nature/ animals and plants	
				Professional/corporate services jobs Social services/public service jobs				Medical/health care job	
				Sales jobs				Transportation jobs	
				Education/research jobs					
				Office jobs					
			Necessary	Office jobs					

Notes: 1. For the groups in the shaded areas, the branching of the first phase was determined by the assessment of the benefits of certification.

2. Regarding the assessment of the necessity of a certification for job acquisition, 2 points were given for “essential,” 1 point for “advantageous” and no points for “irrelevant,” and the 375 certifications which were held by at least 20 respondents were divided into five groups according to the average points given for the assessment—“highly necessary,” “necessary,” “neither necessary or unnecessary,” “unnecessary,” and “completely unnecessary”—so as to ensure that all groups comprise equal numbers of certifications. Certifications held by less than 20 respondents are included in “no certification.”
3. Regarding the assessment of the usefulness of a certification in job performance, 2 points were given for “very useful,” 1 point for “useful” and no points for “not useful.” Certifications were divided into five groups—“very useful,” “useful,” “neither useful nor useless,” “useless,” and “completely useless”—in a similar way to the case of the necessity for job acquisition. Certifications held by less than 20 respondents are included in “no certification.

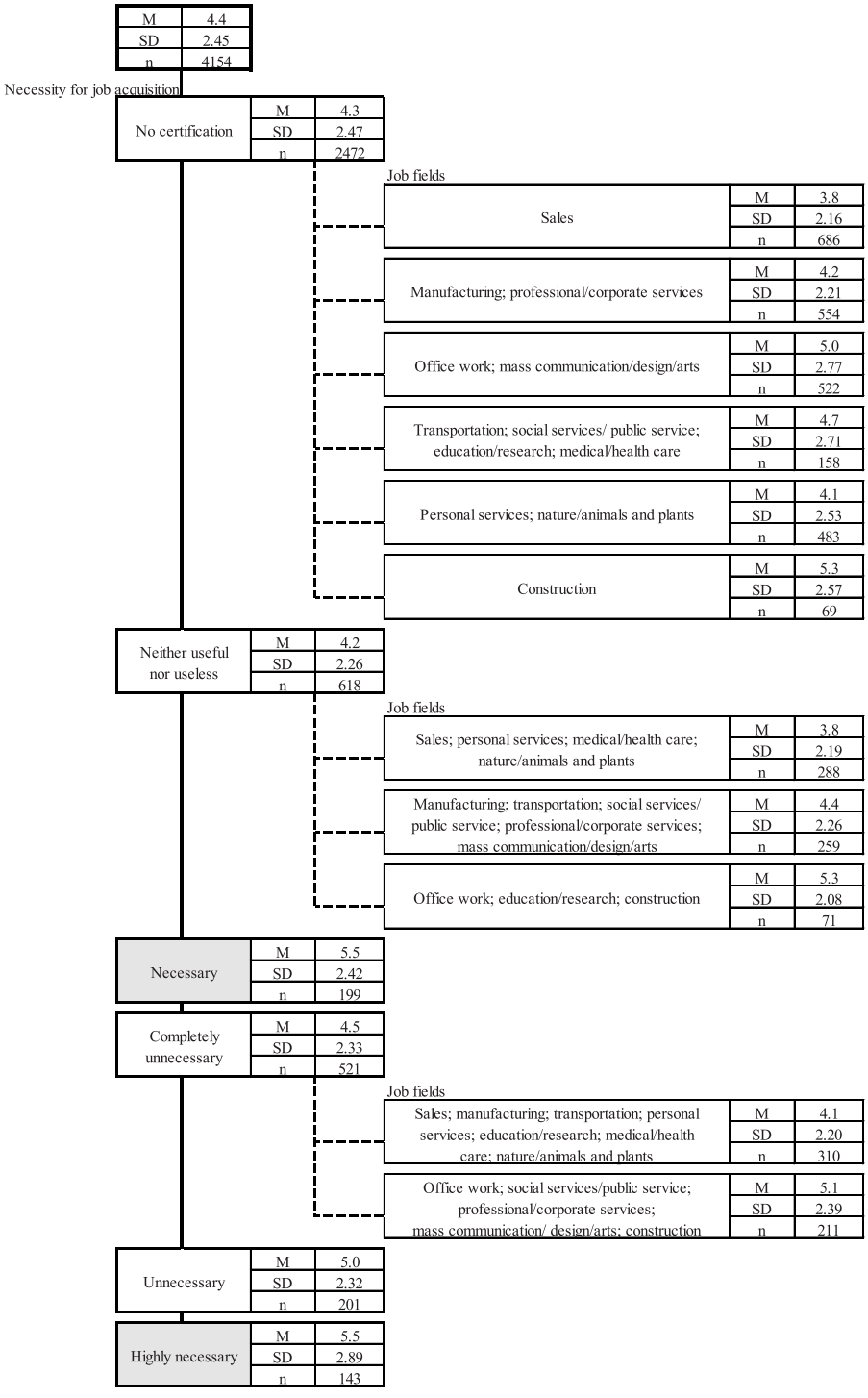


Figure 4. AnswerTree Analysis of the Incomes of Women with High School Educations

who hold certifications that are "highly necessary" or "necessary" [12] earn relatively high incomes (Figure 4). Among women with university degrees with certifications that are "very useful" to the performance of their job duties,[13] incomes were also relatively high, both for women who engage in professional/corporate service jobs and for those aged 30 or older who engage in jobs related to education/research, nature/animals and plants, medical and health care, and transportation.

As shown above, the AnswerTree analysis reconfirmed that the possession of certifications does not automatically lead to higher income, and it also demonstrated the effects of the possession of certification on income level in relation to the benefit it poses in the acquisition of a job and the performance of job duties. For women, the possession of a certification necessary for the acquisition of a job and useful in the performance of job duties tends to lead to higher income, and for men, the possession of certification necessary for the acquisition of a job is also a positive factor in their income, particularly early in their working careers.

V. Significance of Certification

As a result of the above study, it is evident that regardless of the period of time necessary for acquisition, national certifications that are mandatory for people engaging in jobs related to the assurance of health and physical safety are very useful to the holders' acquisition of jobs. There is no doubt that from a social viewpoint, vocational certifications are important for assuring health and physical safety.

One expected role of certification is to serve as a goal to strive for in a worker's efforts to acquire and improve his/her professional skills; in other words, it is what Imano and Shimoda (1995) called "a means to develop skills." According to the survey results, most people acquire certification when they are young, particularly when in their 20s, which suggests that the acquisition of certification serves as a means to develop skills early in the career formation process.

Meanwhile, the most influential factor to the income of women with high school educations is the degree of necessity for the certifications held by them to their acquisition of a job: the income of holders of certifications that are "highly necessary" or "necessary" was relatively high and, in some cases, it was higher than the average income of women with university degrees. In the case of men, the average income of high school graduates in their 30s who held certifications that were "necessary" to the acquisition of a job was significantly higher than the average income of university graduates in their 30s who did not hold any certifications and who engaged in jobs related to personal services or nature/animals and plants. The average income of high school graduates in their 50s who held

[12] About these classifications, see Table 7, Note 2.
[13] About this classification, see Table 7, Note 3.

certifications that were "very useful" in the performance of their job duties and who engaged in jobs related to transportation, professional/corporate services, and construction was significantly higher than the average income of university graduates in their 50s who engaged in personal services jobs. In the case of women with university education, too, the degree of usefulness of their certifications to the performance of their job duties was the most influential factor for income level. Taken together, these findings suggest that although academic attainment is related to the acquisition of certifications—higher academic attainment may be "effective to a certain extent," as noted by Tsuji (2000), in helping applicants acquire certifications by enabling them to be partially exempted from the qualifying examinations or to be granted a reduced required period of working experience, for example—some certifications may supplement academic attainment or support career formation in different ways from academic attainment.

Meanwhile, Kurosawa (2001) emphasized the effectiveness of certification in "mitigating the problem of informational asymmetry between employers and job seekers through the development of standards for evaluating professional skills as indicated by certification, and promoting high-quality job matching in the labor market." This concept of the benefit of certification has something in common with the "certification as a yardstick to measure practical skills" as referred to by Imano and Shimoda (1995). As pointed out by Yahata (1999) and Okubo (2006), certification does not accurately indicate all the professional skills that the certificate holders have. However, if certification held by workers and their records of work experience complement each other in the clarification of their professional skills, it facilitates a smooth labor mobility beneficial to both workers and employers. This means the resolution of a mismatch through "certification underpinned by practical work experience" as mentioned by Fujimura (2000). Workers' practical skills are objectively indicated if their resume is so structured as to combine, in an organic manner, the descriptions of their work experience and the certifications that they hold. Moreover, if the standards for evaluating industry-specific professional skills were developed in ways that were relevant to certification, it would become possible to designate certification as a goal for workers to strive for in their efforts to acquire and improve their practical skills. This also would enable companies to identify workers' professional skills very clearly in their personnel management activities, including recruiting.

While the usefulness of certification to the performance of job duties as mentioned in our survey was assessed by the certificate holders themselves based on their practical experiences, it would be possible to identify the certifications that are relevant to the practical skills required for specific jobs by complementing the results of our survey with a detailed study on the substance of certifications and assessments by employers.

Until now, neither the collection of information nor objective analysis had been adequately implemented with regard to the vocational certifications available in Japan because of their diversity and complexity. We believe that it is important to enhance the information infrastructure of the labor market by using the findings of our survey in the development of

a database of information related to certifications.

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