Effects of Graduate Education on Initial Employment: Evidence from new graduates in the Japanese labor market

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Abstract. This paper replicates models developed by previous research to study the effects of graduate education on new graduates' initial employment in the Japanese labor market. If education is the best investment for an individual's economic success, then graduate degrees are expected to provide an individual with higher-earning job opportunities. Despite this reasonable economic premise, previous research showed that master's degrees in the humanities or social sciences in Japan have, in fact, a negative impact on obtaining initial employment compared to those with only a bachelor's degree in the humanities or social sciences. This previous research, however, could not overcome omitted variable bias because of data limitations. Omitted variable bias is a key problem for research on education; therefore, this study uses new longitudinal data to overcome omitted variable bias and clearly demonstrate the robustness of these earlier findings. The empirical results of this study corroborate earlier work, showing that master's degrees in the humanities or social sciences do not provide graduate students with an advantage in obtaining initial employment, after controlling for potential bias. At the same time, this study also confirms that natural science majors have a higher probability of obtaining initial employment in comparison with humanities or social science majors. In other words, this paper offers a valid replication of existing research. This shows that the Japanese labor market structure for graduate students has, in essence, remained the same since previous research was completed.

Keywords: Graduate Education, Master's Degree, Initial Employment, New Graduates, Japanese Labor Market

1. Introduction

This paper replicates models developed by existing research (Hirao et al., 2015) studying the effects of graduate education on new graduates' initial employment in the Japanese labor market. Although the

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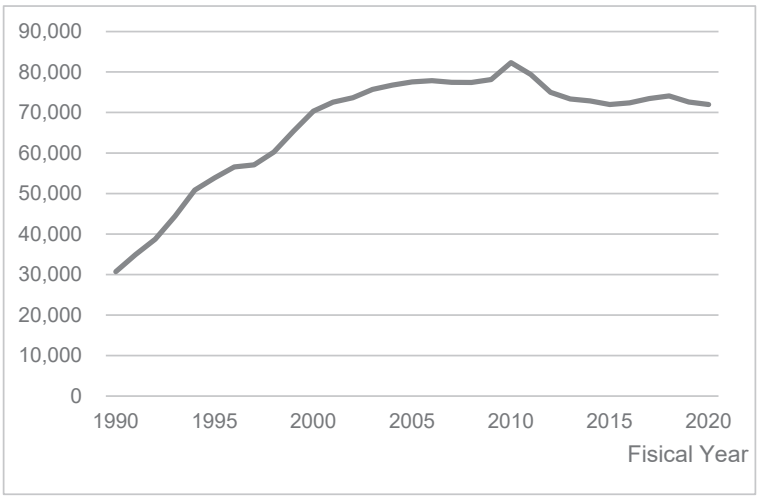

Source: School Basic Survey, MEXT

Figure 1. The number of enrollments in master's courses in Japan

number of enrollments in master's courses has plateaued in recent years, that number has doubled in the last few decades. The number of enrollments in master's courses in 1990 was 30733, which increased to 71954 in 2020 (Figure 1). This expansion of graduate education was the result of educational reforms by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) through the 1990s. When graduate students were relatively few before the 1990s, obtaining initial employment after graduation for graduate students was not a significant social problem. As the overall level of education in society became higher, however, initial employment for graduate students began to develop into a social issue.

The labor market for graduates with master's degrees and graduates with bachelor's degrees is competitive because almost all Japanese private sector enterprises do not distinguish between the recruitment of master' degree holders and bachelor's degree holders. In other words, graduates with master's degrees and graduates with bachelor's degrees must all compete within the same labor market. Human capital theory posits that individuals can increase their productivity through education and training (Becker, 1964), and that education is the best investment for an individual's economic success. Thus, graduate degree holders should obtain higher-earning job opportunities than bachelor's degree holders.

On the other hand, Kariya (2011) pointed out that, as the overall level of education in the Japanese society became higher, it did not mean there were improved employment outcomes for master's degree holders compared to bachelor's degree holders, but there was an indication of a rising of the cut-off point for undergraduate university rank as a function of recruitment in the labor market, with respect to new graduates (except for that of natural science majors). This implies that there is either a non or negative impact of graduate education in the humanities or social sciences on obtaining initial

employment in the Japanese labor market, thus Kariya (2011) calls the validity of human capital theory into question.

Therefore, to elucidate this issue, Hirao et al. (2015) focused on the effects of master's education on new graduates obtaining initial employment in the Japanese labor market. This research showed that master's degrees in the natural sciences lead to an increase in the probability of obtaining initial employment than was the case for bachelor's degree holders in any field. In contrast, master's degrees in the humanities or social sciences had a negative impact on obtaining initial employment relative to bachelor's degree holders in any field. As a result, the research provided some evidence regarding the negative impact of master's education in the humanities or social sciences on obtaining initial employment. As mentioned above, if education is in fact the best investment for an individual's economic success, then graduate degrees would be expected to provide individuals with higher-earning job opportunities. However, the transition from graduate education to the workplace in Japan does not match this economic premise. Japanese master's degree level education in the humanities or social sciences was, rather, a disadvantageous investment for Japanese students.

Although Hirao et al. (2015) succeeded in providing evidence of the null effect of master's education in the humanities or social sciences, their research could not overcome omitted variable bias because of data limitations. Omitted variable bias is a key problem for research on education. This can occur when important control variables are omitted from the estimation models. One of the most common omitted variables is innate ability[1]. If a researcher cannot observe individual specific effects, they are unable to adequately account for the following:

1. Because graduate students' personal abilities are already high regardless of any graduate education, they are better able to obtain higher earning potential in their initial employment.
2. Because graduate education is productive, graduate students are better able to obtain a higher level of initial employment.
3. Because graduate students have higher abilities, they can go to graduate school and thus obtain more promising initial employment.

Therefore, this study uses new longitudinal data to overcome omitted variable bias and clearly demonstrate the robustness of earlier research (Hirao et al., 2015). The rest of this paper is organized as follows: the next section reviews recent relevant empirical studies regarding the effects of graduate education on the Japanese labor market, the following section introduces new data and variables, the fourth and fifth sections introduce empirical models and results, and the final section presents conclusions.

[1] Consequently, the unobserved differences in innate abilities are contained in the error term. Then important independent variables (for example, year of schooling) are correlated with the error term in the estimation model, and this makes regression estimates biased and inconsistent.

2. Review of literature

Numerous studies on returns to education in the United States have clearly demonstrated that more educated workers earn more than less educated workers. Although several studies have focused on the effects of undergraduate education, some of this research analyzed the effects of graduate education. For example, Deere and Vesovic (2006) conducted a review of educational wage premiums and revealed that salaries for workers with graduate degrees were higher than salaries for workers with undergraduate degrees. Similarly, Card (1999) conducted a comprehensive review of the effects of education and concluded that master's degree or Ph.D. holders earn more than bachelor's degree holders in many countries. In addition, using the U.S. Current Population Survey data, Jaeger and Page (1996) revealed that the wage premium of postgraduate degrees was positive and significant. Specifically, they show that master's degree holders earn 6%-17% more than those who hold only a bachelor's degree and that Ph.D. holders earn 9%-11% more than bachelor's degree holders. Song et al. (2008) pointed out that the sorting effects of attending graduate school and the substantial downward bias of the effects of graduate education in previous literature. They found that correcting for the sorting effect raises estimated annualized returns to a master's or doctoral degree from about 5% to 7.3% and 12.8% respectively. In summary, a clear consensus regarding the effects of graduate education on labor market outcomes has been reached at the present time in the United States and other advanced countries.

On the other hand, there are few empirical studies regarding the effects of graduate education on the Japanese labor market. Among what literature on the subject does exist, using micro data from the 2012 Employment Status Survey, Kakizawa et al. (2014) estimate the private internal rate of return for graduate education and assess the postgraduate wage premium in Japan[2]. This study revealed that the internal rates of return for master's degrees are 11.4% for males and 10.1% for females, while those for PhDs are 5.9% for males and 5.7% for females. Similarly, Morikawa (2015) provides evidence on the relationship between graduate education and labor market outcomes. Morikawa (2015) notes that the postgraduate wage premium relative to undergraduates is approximately 30-40 per cent, which is similar in magnitude for male and female workers. Those two studies use Heckman's two-step estimation method to deal with sample selection bias (Heckman, 1979). However, Kakizawa et al. (2014) and Morikawa (2015) could not take omitted variable bias into account because of data limitations. Furthermore, the data used by both studies do not contain information regarding graduates' field of study. Thus, neither study estimates postgraduate wage premiums according to major.

Using the instrumental variables method to overcome omitted variable bias, Suga (2020) estimates the returns for graduate education in Japan. This author notes that the postgraduate wage premium

[2] The Employment Status Survey conducted by Statistics Bureau of Japan is a national representative survey. This survey aims to obtain basic information on actual employment conditions in Japan and includes a very large sample set (about one million).

remains positive and significant, ranging from 16.5-23.7% for men and 13.5-26.4% for women. Yasui (2019) estimates the STEM (Science, Technology, Engineering, and Mathematics) major wage premium and postgraduate wage premium after controlling for individual ability. This author points out that the wage premiums for STEM majors of postgraduate education are 17.8% and 23.4% among men and woman, respectively. These studies, however, do not analyze the effects of graduate education on obtaining initial employment. In short, there are few studies about the effects of postgraduate degrees and majors on labor market outcomes in Japan. Analyzing initial employment as a labor market outcome, this study hopes to offer unique and valuable insights on graduate education in Japan.

3. Data

There are three data sets available for this study. I combined the three sets to estimate the effects of graduate education. The first and second data sets are the web monitoring surveys that were respectively conducted in April and May of 2021 by the Mynavi Corporation, which is a renowned Japanese college student recruitment agency. These are original surveys regarding postgraduate and undergraduate students' job search processes and results. Research subjects were Japanese university students (fourth year students) and master's degree students (second year students). The number of returned surveys was 8408 in April and 7252 in May, for a total of 15060 submitted surveys. The Mynavi Corporation mainly deals with job recruitment in the private sector; therefore, this study targets students seeking employment in the private sector[3]. These surveys were not planned to be coordinated as a longitudinal survey; however, because these data included personal ID numbers as common information, it was possible to merge the data to be able to create longitudinal data. Bias caused by attrition will be managed in the appropriate way using inverse probability weighting (Wooldridge, 2002).

The third data set is the University Ranking published by Asahi Shimbun Publications, Inc. for commercial use. University Ranking includes ranking data[4]. Japanese universities are ranked based on a practice examination conducted by *Juku* (cram schools). This test score is called *Hensachi* (similar to standardized test scores in America like the SAT, for example) and a score of 50 is the mean. Top universities have a higher *Hensachi* score. Because this data includes university names as common information, it is possible to merge the data of this set with the first and second data sets (Figure 2).

[3] Data used in Hirao et al. (2015) were also gathered by the Mynavi Corporation in the same manner. Therefore, both studies target students seeking employment in the private sector.
[4] The University Ranking data is not published in a digital form and was transformed to a digital form through significant man-hours.

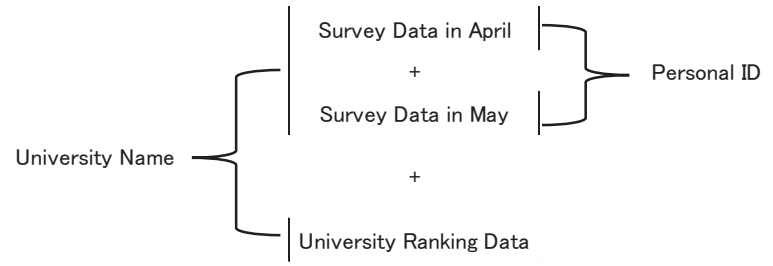

Figure 2. Data set

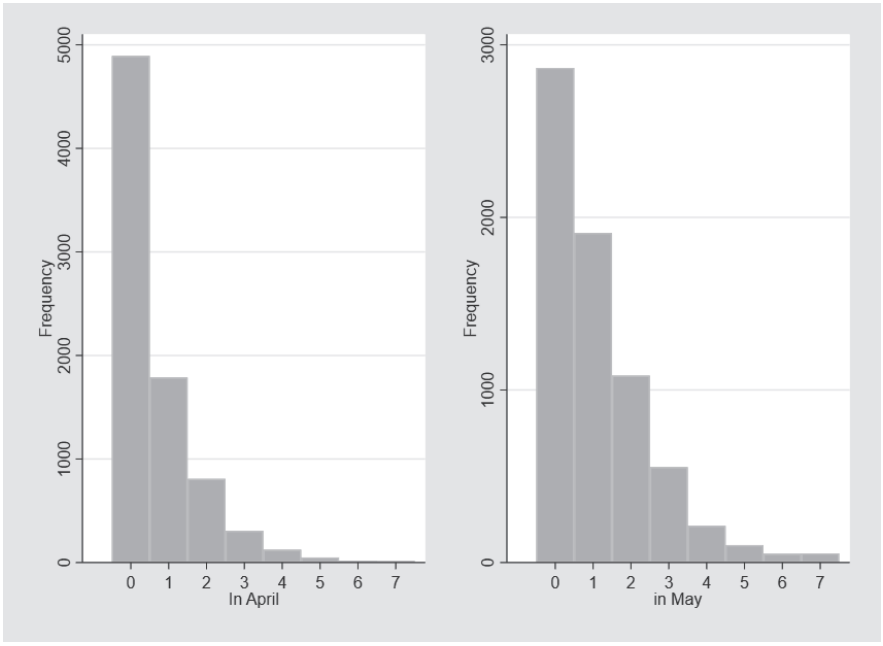

Figure 3. The number of job offers

The dependent variable in the estimation model is the number of job offers a given student received (from 0 to 7) at the time the survey was conducted. Because the dependent variable is nonnegative count data (Figure 3), this study requires a Poisson regression model. The independent variable is a dummy variable consisting of individuals' degrees and majors. This is a categorical variable which can take on four different values: 1) master's degree in the natural sciences; 2) master's degree in the humanities or social sciences; 3) bachelor's degree in the natural sciences; and 4) bachelor's degree in the humanities or social sciences. If the baseline value is a bachelor's degree in the humanities or social sciences (bachelor's degree in the HSS), then the three following dummy variables are constructed:

Table 1. Descriptive statistics

	Whole sample N=14829				Drop subjects who only completed the survey in May N=10712			
	Mean	STDV	Min	Max	Mean	STDV	Min	Max
The number of job offers	0.879	1.230	0	7	0.831	1.186	0	7
May (time dummy)	0.461	0.498	0	1	0.314	0.464	0	1
Bachelor's degree in the HSS	0.647	0.478	0	1	0.642	0.479	0	1
Bachelor's degree in the NS	0.243	0.429	0	1	0.243	0.429	0	1
Master's degree in the HSS	0.011	0.106	0	1	0.011	0.104	0	1
Master's degree in the NS	0.099	0.298	0	1	0.103	0.305	0	1
University rank	49.485	7.462	35	68	49.458	7.474	35	68
Female	0.654	0.476	0	1	0.654	0.476	0	1
The number of applications submitted	13.098	10.852	0	41	12.913	10.762	0	41

Note: The description of the resident area (prefecture) variables are not reported for convenience.

1. Master's degree in the NS=1 if individuals hold master's degrees in the natural sciences and 0 otherwise;
2. Master's degree in the HSS=1 if individuals hold master's degree in the humanities or social sciences and 0 otherwise;
3. Bachelor's degree in the NS=1 if individuals hold bachelor's degree in the natural sciences and 0 otherwise.

The control variables are time dummy (May=1), gender (female=1), the number of applications submitted during job search, residence area (prefecture) dummy and university rank. The descriptive statistics summarized in Table 1 show that the average number of job offers a given student received at the time the survey was conducted was smaller than 1. The number of applications submitted during the job search was about 13 on average.

4. Estimation methods

Although the empirical model of this study follows the strategy set forth in Hirao et al. (2015), this study requires new regression models because of the use of longitudinal data. First, I will outline a simple random-effects Poisson model to control for individual specific effects:

$$Y_{it} = \alpha + \beta_1 X_{it} + \beta_2 Z_i + \upsilon_{it} \quad (1)$$

$$\upsilon_{it} = \gamma_i + \varepsilon_{it} \quad (2)$$

where Y_{it} is the number of job offers of individual i at the time t, α is an intercept term, X_{it} stands for the independent variables whose values can vary across time (time-varying variables), e.g. the number of applications submitted, and Z_i is the vector of other independent variables whose values do not change across time (time-invariant values), e.g. gender. Dummy variables consisting of individuals' degrees and majors are included in Z_i. Now, υ_{it} in equation (1) is replaced by equation (2) for υ_{it}:

$$Y_{it} = \alpha + \beta_1 X_{it} + \beta_2 Z_i + \gamma_i + \varepsilon_{it} \quad (3)$$

γ_i and ε_{it} are both error terms. While γ_i only varies across individuals and not across time, ε_{it} is different for each individual at each point in time. If γ_i is uncorrelated with the independent variables, then a random effects model can provide unbiased estimates of both β_1 and β_2.

Second, to calculate the effects of graduate education differently, I outline a simple multilevel mixed-effects Poisson regression:

$$Y_{ij} = \beta_{0j} + \beta_3 X_{ij} + \varepsilon_{ij} \quad (4)$$

$$\beta_{0j} = M_{00} + \upsilon_{0j} \quad (5)$$

where Y_{ij} is the number of job offers of individual j at the time i, X_{ij} is an important independent variable. If there are differences from individual to individual, the intercept β_{0j} can be broken down into two parts: M_{00} is an average value of the intercept (random), and υ_{0j} is a group dependent part of the intercept (fixed). Now, β_{0j} in the level 1 model (equation [4]) is replaced by the level 2 model (equation [5]) for β_{0j}:

$$Y_{ij} = M_{00} + \upsilon_{0j} + \beta_3 X_{ij} + \varepsilon_{ij} \quad (6)$$

Because the intercept is different from individual to individual, this is called a random-intercept model. The gradient of the regression line for each individual, however, is fixed at β_3.

For the baseline estimation, the pooled Poisson regression is estimated by focusing on a dummy variable consisting of individuals' degrees and majors. Taking omitted variable bias into account, equation (3) is also estimated using the random-effects Poisson model intended for all samples. Furthermore, equation (6) is also estimated using the multilevel mixed-effects Poisson regression with inverse probability weighting.

Incidentally, there are three types of subjects in the individual data set. The first are subjects who only completed the survey in April, the second are subjects who only completed the survey in May, and the last are subjects who completed both surveys for both months. When equation (6) is estimated, I drop

drop the second subjects from the sample to correct bias caused by attrition, because if attrition takes place systematically in the panel data, then it may create a sample selection bias. Generally speaking, if students obtain employment, they might not use the services of a recruitment agency. In other words, it can be assumed that the sample of this study drops systematically from the longitudinal survey. If equation (6) is estimated with no weighting, the estimated coefficient β_3 will be underestimated because subjects who do not obtain employment remain over time.

I require an inverse probability weighting approach to correct this sample selection bias. The dependent variable of attrition selection equation is a dummy variable that a sample is dropped or not (do not drop=1). The independent variables are the number of job offers of an individual, attendance at national or private university (national university=1), gender (female=1), and major (natural science=1). First, I estimate the attrition selection equation and obtain a predicted probability. Second, I use $1/\hat{P_{it}}$ as the weight in the equation (6).

5. Empirical results

5.1. Main results

The main results of these analyses are presented in Table 2. Estimated coefficients can be displayed as marginal effects (dy/dx). The result of the pooled Poisson regression is provided in the first column. As explained above, random-effects models and multilevel mixed-effects models are better able to control for unobserved innate ability. For that reason, it is possible that this result may contain bias. The second column shows the result of random-effects models. Master's degree holders in the natural sciences obtain 28.6% more job offers than bachelor's degree holders in the humanities or social sciences do, whereas master's degree holders in the humanities or social sciences obtain 71.5% fewer job offers than do bachelor's degree holders in the humanities or social sciences. The third column shows the result of mixed-effects models, and the fourth column lists the result of mixed-effects models using inverse probability weighting. Looking at the difference in the marginal effect on independent variables between the third and fourth columns, I find that absolute value of column 3 is lower than absolute value of column 4. In other words, the estimated coefficient β_3 by mixed-effects models using no inverse probability weighting is biased downward in this sample.

Mixed-effects regression using inverse probability weighting estimates suggest that although master's degree holders in the natural sciences obtain 37.4% more job offers than bachelor's degree holders in the humanities or social sciences do, master's degree holders in the humanities or social sciences obtain 81.4% fewer offers than do bachelor's degree holders in the humanities or social sciences.

Table 2. Main results

	Pooled	RE	ME	ME with IPW
	dy/dx	dy/dx	dy/dx	dy/dx
May (time dummy)	0.378 ***	0.486 ***	0.373 ***	0.398 ***
	(0.017)	(0.018)	(0.013)	(0.013)
Bachelor's degree in the HSS	ref.	ref.	ref.	ref.
Bachelor's degree in the NS	0.217 ***	0.295 ***	0.254 ***	0.307 ***
	(0.021)	(0.029)	(0.029)	(0.032)
Master's degree in the HSS	-0.609 ***	-0.715 ***	-0.773 ***	-0.814 ***
	(0.126)	(0.178)	(0.181)	(0.194)
Master's degree in the NS	0.205 ***	0.286 ***	0.284 ***	0.374 ***
	(0.026)	(0.039)	(0.039)	(0.042)
University rank	0.018 ***	0.024 ***	0.019 ***	0.022 ***
	(0.001)	(0.002)	(0.002)	(0.002)
Female	-0.129 ***	-0.156 ***	-0.130 ***	-0.130 ***
	(0.019)	(0.027)	(0.027)	(0.029)
The number of applications submitted	0.016 ***	0.023 ***	0.018 ***	0.020 ***
	(0.001)	(0.001)	(0.001)	(0.001)
Resident area	YES	YES	NO	NO
LR test	—		2033.0 ***	—
ICC	—		0.739	0.909
Var (_cons)	—		0.778 ***	1.373 ***
			(0.031)	(0.048)
Observations	14829	14829	10712	10712
Group	—	11513	7396	7396
Wald chi2	1992.4 ***	3078.5 ***	2011.0 ***	2125.0 ***
Log likelihood	-19003.0	-17753.4	-12323.3	-16040.7

Note: Standard errors are in parentheses. *significant at 5%; **significant at 1%; *** significant at 0.1%.

Thus, master's degrees in the natural sciences lead to a greater increase in the probability of obtaining initial employment than was the case for bachelor's degrees in the humanities or social sciences. In contrast, master's degrees in the humanities or social sciences have a negative impact on obtaining initial employment relative to bachelor's degree holders in the humanities or social sciences. These results support the results of earlier research (Hirao et al., 2015).

5.2. Robustness checks

The estimates of the effects of graduate education on obtaining initial employment are quite stable and statistically significant. Bachelor's and master's degree holders, however, might not seek initial employment in the same labor markets. In fact, bachelor's degree holders tend to target a wider range

of industries and companies in order to obtain initial employment than do master's degree holders, who have a tendency to aim for specialized industries and occupations with higher earning potential in their initial employment searches. Additionally, for a group with a wider target of potential employers, the number of job offers would be high relative to those of a group with a specialized employer target. Undergraduate students, therefore, might be more apt to securing a greater number of job offers than graduate students. In short, the appropriateness of the dependent variable warrants consideration.

Therefore, two sets of robustness checks are conducted to elucidate this issue. First, the effects of graduate education are separately estimated for those who studied in the humanities or social sciences and those of natural sciences. At the same time, the effects of graduate education are separately estimated for those holding bachelor's degrees and those with master's degrees. The random-effects Poisson model and multilevel mixed-effects Poisson regression estimations, presented in Table 3, show that the marginal effects of holding a master's degree in the humanities or social sciences is negative and statistically significant. In addition, the marginal effects of natural science majors are positive and statistically significant.

Second, a dependent variable is converted from the number of job offers to whether or not students were able to find a job (find a job=1, otherwise=0). The random-effects logistic model and multilevel mixed-effects logistic regression estimations, presented in Table 4, reveal the same results as mentioned above, namely that the marginal effects of master's degrees in the humanities or social sciences are negative and statistically significant. The marginal effects of natural science majors, moreover, are positive and statistically significant. The robustness checks in this section suggest that the main results are robust to alternative specifications.

6. Conclusion

This study attempts to analyze the effects of graduate education on initial employment in the Japanese labor market in order to replicate models developed by Hirao et al. (2015). The empirical results of this study confirm earlier studies, showing that master's degrees in the humanities or social sciences do not provide graduate students with an advantage in obtaining initial employment, after controlling for potential bias. At the same time, this research also confirms that majoring in natural sciences leads to an increase in the probability of obtaining initial employment, compared humanities or social science majors. In other words, this paper successfully replicates previous research (Hirao et al., 2015). Although said previous research could not overcome omitted variable bias, if that research has validity, this study also shows that the Japanese labor market structure for graduate students has, in essence, remained the same since noted study was completed.

Why then do master's degrees in the humanities or social sciences not increase the probability of obtaining initial employment in the Japanese labor market? This question is somewhat beyond the scope of this study, and more discussion will be needed for generating further research in order to

Table 3. Effects of graduate education on the number of job offers

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable	The number of job offers							
Method	Random-effects Poisson model				Multilevel mixed-effects Poisson regression			
Sample	HSS	NS	Bachelor	Master	HSS	NS	Bachelor	Master
Independent variable								
Master	-0.705 ***	0.017			-0.778 ***	0.072		
	(0.154)	(0.048)			(0.187)	(0.059)		
NS			0.302 ***	1.064 ***			0.313 ***	1.424 ***
			(0.031)	(0.135)			(0.032)	(0.214)
Observations	9756	5073	13196	1633	6998	3714	9488	1224
Group	7669	3844	10323	1190	4911	2485	6615	781

Note: Estimated coefficients are displayed as marginal effects (dy/dx). Standard errors are in parentheses. *significant at 5%; **significant at 1%; *** significant at 0.1%. Although time dummy, university rank, gender, the number of applications submitted, and resident area are included in estimations (1) to (4), these are not reported for convenience. Although time dummy, university rank, gender, the number of applications submitted, and IPW weight are included in estimations (5) to (8), these are not reported for convenience.

Table 4. Effects of graduate education on finding a job

	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Dependent variable	Whether or not students were able to find a job							
Method	Random-effects logistic model				Multilevel mixed-effects logistic regression			
Sample	HSS	NS	Bachelor	Master	HSS	NS	Bachelor	Master
Independent variable								
Master	-0.178 ***	0.074 ***			-0.249 ***	0.086 **		
	(0.036)	(0.018)			(0.055)	(0.027)		
NS			0.064 ***	0.629 ***			0.154 ***	0.449 ***
			(0.009)	(0.071)			(0.015)	(0.055)
Observations	9756	5073	13196	1633	6998	3714	9488	1224
Group	7669	3844	10323	1190	4911	2485	6615	781

Note: Estimated coefficients are displayed as marginal effects (dy/dx). Standard errors are in parentheses. *significant at 5%; **significant at 1%; ***significant at 0.1%. Although time dummy, university rank, gender, the number of applications submitted, and resident area are included in estimations (9) to (12), these are not reported for convenience. Although university rank, gender, and the number of applications submitted are included in estimations (13) to (16), these are not reported for convenience. Time dummy and IPW weight are greater predictors of finding a job. Because quasi-complete separation exists, these variables are omitted in the estimation (13) to (16).

adequately answer this question. However, it seems pertinent that the number of enrollments in master's courses has increased since the 1990s, meanwhile the number of enrollments in undergraduate courses has also expanded. In addition, there are relatively few master's degree holders in the private sector. Hamanaka (2015) notes that there are few interviewers in private Japanese companies who can evaluate the quality of graduate education. Human resource management in the Japanese private sector exacerbates the negative effects of educational mismatch (Yoshida, 2020).

Consequently, master's degrees are in less demand when a candidate seeks work as a professional in a Japanese enterprise. Moreover, master's degree holders in the humanities or social sciences often do not seek initial employment in private sector enterprises. Instead, they may hope to obtain initial employment as a government official, lawyer, accountant, entrepreneur, teacher, etc. If graduate students hope to work as government officials, they must choose a different path than that leading to employment in the private sector, namely, they must instead qualify for public service through civil servant examinations. In this case, graduate education in the humanities or social sciences might have different effects from those described by this research. The same applies to other career choices other than employment in a private company or institution.

These points of discussion remain conjectural, and thus, future research is needed to clarify why Japanese master's level education in the humanities or social sciences has a negative impact on obtaining initial employment in the Japanese private sector. There are limitations to both this study and the noted previous study, namely that the sample consists of students who are seeking employment in the private sector. The findings of this study, therefore, are generalizable only to these students and need to be carefully interpreted with this limitation in mind.

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