Marriage and Wage for Men: Evidence from Japan

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Abstract

This paper provides the evidence about two hypotheses of the relationship between marriage and wages for Japanese men: the division of household hypothesis and the unobservable individual heterogeneity hypothesis. OLS estimation shows the marriage wage premium is about 20 % in Japan and it disappears by FE estimation so that wage gap between married and single men is due to an unobservable individual heterogeneity. Using partner's working status, a full-time housewife cause a part of wage differences between married and single men by OLS estimation but most of reason to raise married male wage is still the unobservable individual heterogeneity.

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I Introduction

The purpose of this paper is to examine the marriage wage premium for men using Japanese panel data.

The marriage wage premium defined in this paper is that the marriage still affects male wages to increase even if controlling individual information such as ages and working based information. Figure 1 describes average wage differences between married men and single men in each age generation using the data named the Keio University Household Survey 2004 to 2012. Married men have higher average wage per hour especially after 30s and the average male married age is 28 years old by Table 2. Combined with these facts, it seems quite probable that wage level dramatically increase after 30s, in other words after the marriage for men.

Why this difference happened. There are four hypotheses established from previous study: the division of household hypothesis, the labor productivity hypothesis, the discrimination hypothesis and the unobservable individual heterogeneity hypothesis. They can be divided into two categories: the causality effect (the division of household hypothesis and the discrimination hypothesis) and the bias effect (the productivity hypothesis and the unobservable individual hypothesis).

Here the causality effect means that the effect comes purely from the marriage on wages even controlling other observable individual information such as ages, education background and working status. This effect depends on the marital change for each person. The division of household hypothesis is one of them and it is about the effect from intra-household specialization on wage increasing. According to Becker (1991), women are comparative advantage to housework than men so that men would be concentrate on their work after marriage and it results male wage premium. Loh (1996) used the National Longitudinal Survey of Youth (1979) to verify the effect from employment period of wife on wages of husband and showed no significant effect of longer female working period on decreasing male wages. Gray (1997) used the same data to examine the effect of wife working status on husband wages and found that husband wages increase slower if their wife works after the marriage. Bardasi and Taylor (2006) gives an evidence that marriage wage premium appears by a productivity difference due to intra-household specialization using the British Household Panel Survey. Vernon (2009) shows that marriage encourages women to have more leisure time but makes men working more with the American Time Use Survey. Pollmann-Schult (2010) refers that men with a partner who has not worked have much

more premium than others even control selection of tendency for getting married using the German Socio-Economic Panel. The discrimination hypothesis notes employer's side. Some employers set married men above single men because they believe men have much more responsibility after marriage. For this hypothesis, empirical research is difficult to work out due to lack of the data of employer's side about discrimination. In this paper, I focus on the division of household hypothesis and verify how intra-household specialization cause male wages in Japan.

The bias effect defined in this paper is about self-selection bias. If marriageable men are also productive men, the wage difference between married men and single men may not depend on the marriage. The labor productivity hypothesis supposed the labor productivity between married and single people are different. For example, married men have high productivity for working than single men by nature. Loh (1996) used the National Longitudinal Surveys of Youth (1979) to estimate productivity differences and found that the productivity differences do not cause the marriage wage premium. Pollmann-Schult (2010) compared satisfaction with their income and indicates married men are more likely to have less satisfaction than single men so that work harder. The unobservable individual heterogeneity hypothesis is about individual information which

cannot be captures by a data, for example, IQ, personality and other ability such as communication skills and cause the marriage wage premium. Some of studies support this hypothesis (Korenman and Neumark 1991, Loh 1996 and Gray 1997) but Ginther and Zavodny (2000) and Antonovics and Town (2004) claim that other factors except the unobservable individual heterogeneity cause the male marriage wage premium. In this paper, I also focus on the unobservable individual heterogeneity hypothesis.

There are several researches about marriage and wage in Japan. Kawaguchi (2005) uses the Japanese Panel Survey of Consumers to verify the marriage wage premium for men and women. This data only contains married men so that the analysis about men has limitation. To solve this problem, Sato (2012) used the Keio University Household Panel Survey contained both married and single men to verified the unobservable individual heterogeneity hypothesis with propensity score matching and supported this hypothesis. Yukawa (2013) also used the same data but examine the effect of the marriage on labor supply for men and women. The results show that higher education background of husband than wife leads male working time more and female working time and it supports the intra-household specialization by Becker (1991). In this paper, I re-examine the unobservable individual heterogeneity hypothesis using the

fixed effect model and also verify the division of household hypothesis using the interaction term with partner's working status and the education difference between husband and wife.

Ⅱ Data and descriptive statistics

1. Data

The data used in this study is the Keio University Household Panel Survey (KHPS) from 2004 to 2012. This data contains basic individual information such as working status, years of working experience, tenure, education, marital status and child information. There is also enough partners' basic information.

Considering income level suddenly decline after 60 years old because of the retirement, the sample data I used is from 20 years old to 59 years old excluding students. If there is missing value, it is also removed.

KHPS has the same information of both married people and single people. It is helpful to verify marriage wage premium accurately for male. Besides, KHPS covers much more recent years and it is possible to know recent evidence.

2. Descriptive statistics

Table 1 and Table 2 report descriptive statistics of married men and single men. Table 1 shows individual information and Table 2 shows marital information and partner's information. Average wage per hour in Table 1 is defined as the following,

$$hwage = \frac{Income}{Hour \times 52(weeks)}$$

where *Income* is year amount calculated from payment and bonus information in a questionnaire, *Hour* means working hours per week including overworking time. Other variables are describes in Table 7.

For married men, the average wage per hour is about 2,776 JPY and about 2,000,000 JPY much higher in a year than single men with 1,837 JPY average wages per hour. That is to say there can be marriage wage premium for men. For other variables, there is almost no difference for education years. Table 1 also shows that married men have longer years of experience in labor market and tenure than single men. That may be from average age difference between married people and single people. In Table2, about 30 % of partners are house workers and almost 44% of couples have the same education background. About 31% of married men graduated higher educational school than their partners.

Ⅲ Unobservable individual heterogeneity and marriage wage premium

1 Empirical methodology

I estimate the following mincer equation for marriage wage premium.

$$\ln(hwage_i) = \alpha + \beta_1(Marriage)_i + \beta_2(Duration\ of\ Marriage)_i + \beta_3(Child\ under\ 6\ years\ old)_i + X_i\beta_4 + \beta_5 d_t + c_i + v_i \quad (1)$$

where, $hwage_i$ is the hourly wage of individual i defined in Section Ⅱ, $Marriage$ is a dummy variable about marital status and $Duration\ of\ Marriage$ is only for married people. $Child\ under\ 6\ years\ old$ is a dummy variable for considering the effect of childcare on employment status. X is a vector of observable individual characteristics such as educational and employer-related characteristics. d is a year dummy for controlling the macro effect such as price fluctuation. c captures the unobservable individual time-invariant characteristics and v is a random error. If there is marriage wage premium, β_1 becomes positive and statistically significant.

Estimating this equation by OLS implicitly assumes that c is zero and uncorrelated with both w and X. However, X includes educational and employment-related information that are correlated with any unobserved factors, for example ability or personality in c. Panel data allow overcoming this endogeneity

problem by estimating (1) using fixed effects. Therefore the model to be estimated becomes as follows,

$$\ln(hwage_{it}) - \ln(\overline{hwage_{\iota}})$$

$$= \beta_1\{(Marriage)_{it} - \overline{(Marriage)_{\iota}}\}$$

$$+ \beta_2\{(Duration\ of\ Marriage)_{it} - \overline{(Duration\ of\ Marriage)_{\iota}}\}$$

$$+ \beta_3\{(Child\ under\ 6\ years\ old)_{it} - \overline{(Child\ under\ 6\ years\ old)_{\iota}}\} + (X_{it} - \bar{X}_{\iota})\beta_4$$

$$+ \beta_5(d_t - \overline{d_t}) + u_i \quad (2)$$

In this equation, the individual unobserved heterogeneity c is removed and the variables are defined as deviations from their individual means over the whole period, and u is an error term.

Table 3 shows transition matrix for male about change of marital status. In this paper, I used Fixed Effect estimation to measure marriage wage premium so that it is necessary for comparing wage change between married people and single people to have enough change of marital status during investigation period for this panel data. From these tables, there is 4.35% change from single people to married people. It is appropriate to verify the hypotheses of marriage wage premium with panel data.

2. Empirical Result

Table 4 summarizes the results of OLS estimation and FE estimation. OLS estimation represent that married people have 20% points higher wage than single people. Namely, there is marriage wage premium for men. However, FE estimation show marriage wage premium disappear.

Regarding other variables, by OLS estimation, one year longer duration of marriage increases male wage 0.4% points. One year increasing of education raises male wage 4.6% points. Experience years and tenure effect cause a rise in the male wage with 1.5% and 2.8% points for each. FE estimation shows no significant effect from duration of marriage on wage. Experience years and tenure still have effect on wage with 13% for each.

Consequently, I used KHPS to verify the effect of marriage premium for males and found that married people have higher wage than single people by OLS. In FE estimation, however, the effect has no statistical significance. It means that unobservable individual heterogeneity cause male marriage premium and the result is consistent with previous studies.

3. Robustness check

Here I will examine the effect of marriage on wage with controlling size of company and industrial type. Generally, it is fast to rise in salary and well supported of a childcare system in a big company than a smaller size of company. Besides, Bang and Basu (2011) remarks that "less skill-intensive industries often pay lower wages" and found "employment in higher skill, higher paying industries is less for married women". In order to consider endogeneity between company based information and marital status, it is necessary to control these variables for robustness check.

Table 5 shows the results. I can know there is still marriage wage premium by OLS estimation but disappeared by FE estimation for male. These results indicate that marriage wage premium is due to unobservable individual time-invariant factors for male. In other words, the wage difference between married men and single men is not necessarily caused by marriage, suggesting that male marriage wage premium can be explained by the bias due to personal attributes.

In the next section, I will discuss the intra-household specialization hypothesis and marriage wage premium.

Ⅳ Intra-household specialization and marriage wage premium

In this section, I use an interaction term to examine the effect of division of household work after marriage on male wages. According to Becker (1991), men have comparative advantage in labor market and women have comparative advantage in house works. If the marriage promotes intra-household specialization, it is possible to indicate married men would spend more time to labor work and have higher wage than single men. I use a dummy variable of full-time housewife to verify how partner's working status affect individual wages. Moreover, I use a dummy variable of an education difference between individuals and partners to estimate how the education difference relates to marriage effect on wages. According to Yukawa (2013), if the education difference represents the comparative advantage difference, the higher education difference would lead higher effect from marriage on male wages.

1 Empirical methodology

I estimate the following mincer equation,

$$\ln(hwage_i) = \alpha + \beta_1(Marriage)_i + \beta_2(Duration\ of\ Marriage)_i + \beta_3(Marriage \times Housework)_i + X_i\beta_4 + \beta_5 d_t + c_i + v_i \quad (3)$$

where, $Marriage \times Housework$ is the interaction term of marriage and full-time housewife. If the partner working status cause marriage wage premium, β_3 becomes positive and statistically significant.

For examining the effect of education difference, I use the following model,

$$\ln(hwage_i) = \alpha + \beta_1(Marriage)_i + \beta_2(Duration\ of\ Marriage)_i + \beta_3(Marriage \times Education\ Difference)_i + X_i\beta_4 + \beta_5 d_t + c_i + v_i \quad (4)$$

where $Marriage \times Education\ Difference$ is the interaction term of marriage and education difference which to one if an individual has higher education background than his partner. If the education difference represents the comparative advantage difference, β_3 becomes positive and statistically significant.

2. Empirical Result

Table 6 summarizes the results of OLS estimation and FE estimation. OLS estimation represent that when a partner is full-time housewife, married men have 6.6% points higher wage than single people. The effect of marriage on wage decreases compare to Table 4 OLS estimation. It indicates that partner's working status increase the marriage wage premium. However, FE estimation shows this effect disappeared.

For the education difference, Table 6 shows no significant results for both OLS estimation and FE estimation. Though there is no efficient evidence to support the division of household hypothesis, it is possible to indicate the education difference may not represent the comparative advantage of household.

Therefore, I verify the possibility of over-evaluating of marriage wage premium through intra-household specialization and I found that the partner's working status contributes a part in OLS estimation. Considering the effect of the education difference between couples, there are no statistic significant results in both OLS and FE estimation. From these results, one may say that the partner's working status is one of the causes to increase male marriage wage premium, but most of parts are from unobservable individual heterogeneity.

V Conclusion

In this paper I examine two hypotheses about the relationship between marriage and wages for Japanese men. For the unobservable individual heterogeneity hypothesis, OLS estimation yields marriage wage premium for male of 20%, consistent with the previous literature. However, it disappears by FE estimation so that wage gap

between married male and single male is due to an unobservable individual heterogeneity. For the division of household hypothesis, I found that a full-time housewife cause a part of wage difference between married men and single men by OLS estimation but it disappears with FE estimation. In other words, the partner's working status causes marriage wage premium for men in a part, and most of reason to raise wages of married men is due to the unobservable individual heterogeneity.

One area of future work will be to clarify contents of unobservable individual heterogeneity affecting male wages increasing and also represent the relationship between marriage and wage for women.

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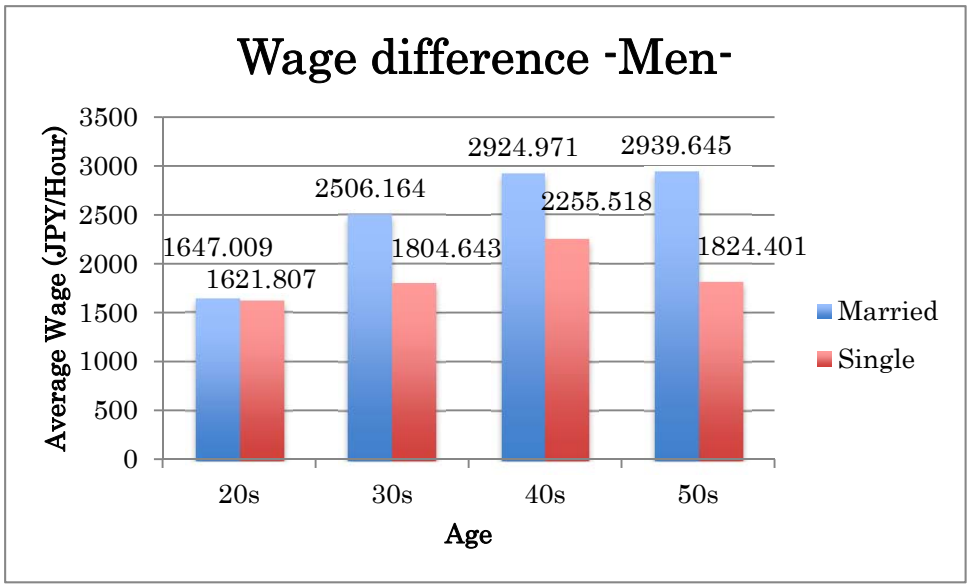
Figure 1: Wage gap between married and single men in Japan



Data from KHPS 2004-2012

Table 1: Descriptive Statistics

	Men			
	Married		Single	
	Mean	(SE)	Mean	(SE)
Explained Variable				
Wage per hour (JPY)	2776.391	4414.534	1813.755	2113.757
Individual Information				
Age	49.890	11.117	40.057	12.877
Number of Children	1.404	0.986	0.271	0.479
Number of Children under 6	0.121	0.326	0	0
Educational Information				
Years of education	13.288	2.974	13.660	2.908
Junior high school	0.081	0.273	0.058	0.234
High school	0.461	0.498	0.409	0.492
Vocational school	0.064	0.245	0.089	0.285
University	0.328	0.470	0.342	0.474
Graduated school	0.033	0.179	0.045	0.208
Working Information				
Years of experience	29.522	11.850	19.262	13.558
Tenure	13.925	12.177	7.149	8.284
Size of company	0.234	0.423	0.202	0.402
Change a job	0.035	0.184	0.067	0.250
Area Information				
Living in big city	0.274	0.446	0.319	0.466
Sample Size	9176		2386	

Table 2: Descriptive Statistics (Cont.)

	Men			
	Married		Single	
	Mean	(SE)	Mean	(SE)
Marriage Information				
Age of getting married (Now)	28.122	5.188	—	—
Age of getting married (First)	27.018	4.452	27.708	5.345
Duration of marriage (Now)	21.792	11.714	—	—
Partner's Information				
Educational Information				
Junior high school	0.079	0.269	—	—
High school	0.477	0.500	—	—
Vocational school	0.258	0.438	—	—
University	0.121	0.326	—	—
Graduated school	0.007	0.086	—	—
Others				
Wage per hour (JPY)	1540.392	2640.166	—	—
Full-time housewife dummy	0.321	0.467	—	—
Education Difference				
Husband＝Wife	0.444	0.497	—	—
Husband＞Wife	0.318	0.466	—	—
Husband＜Wife	0.152	0.359	—	—
Sample Size	9176		2386	

Table 3: Transition Matrix for Men

		T + 1			
		Single 0	Married 1	Total	
T	Single	1,672	76	1,748	N
	0	95.65	4.35	100	%
	Married	40	7,125	7,165	N
	1	0.56	99.44	100	%
Total		1,712	7,201	8,913	N
		19.21	80.79	100	%

Table 4: Result

	(1)	(2)	(3)	(4)
Model	OLS	OLS	FE	FE
Explained Variable	Log Wage	Log Wage	Log Wage	Log Wage
Married	0.209	0.222	-0.026	-0.015
	(0.038)***	(0.041)***	(0.047)	(0.049)
Duration of Marriage	0.004	0.003	-0.001	-0.002
	(0.002)**	(0.002)*	(0.003)	(0.003)
Child under 6 years old	—	-0.030	—	-0.026
	—	(0.029)	—	(0.026)
Years of Education	0.046	0.046	—	—
	(0.005)***	(0.005)***	—	—
Years of Experienced	0.021	0.020	0.129	0.127
	(0.005)***	(0.005)***	(0.031)***	(0.031)***
(Years of Experienced)^2	-0.046	-0.045	-0.110	-0.109
	(0.010)***	(0.010)***	(0.010)***	(0.010)***
Tenure	0.025	0.025	0.013	0.013
	(0.003)***	(0.003)***	(0.003)***	(0.003)***
(Tenure)^2	-0.022	-0.022	0.002	0.002
	(0.008)***	(0.008)***	(0.009)	(0.009)
Constant	6.248	6.257	5.077	5.105
	(0.082)***	(0.083)***	(0.705)***	(0.706)***
Years Dummy	Yes	Yes	Yes	Yes
Big City Dummy	Yes	Yes	Yes	Yes
R^2	0.19	0.19	0.04	0.04
N	11,024	11,024	11,024	11,024

* $p<0.1$; ** $p<0.05$; *** $p<0.01$.

Standard error is noted in brackets.

Table 5: Result (Robustness)

	(2)	(5)	(4)	(6)
Model	OLS	OLS	FE	FE
Explained Variable	Log Wage	Log Wage	Log Wage	Log Wage
Married	0.222	0.173	-0.015	-0.061
	(0.041)***	(0.039)***	(0.049)	(0.046)
Duration of Marriage	0.003	0.002	-0.002	-0.001
	(0.002)*	(0.002)	(0.003)	(0.003)
Child under 6 years old	-0.030	-0.054	-0.026	-0.024
	(0.029)	(0.025)**	(0.026)	(0.025)
Years of Education	0.046	0.028	—	—
	(0.005)***	(0.005)***	—	—
Years of Experienced	0.020	0.027	0.127	0.129
	(0.005)***	(0.004)***	(0.031)***	(0.031)***
(Years of Experienced)^2	-0.045	-0.056	-0.109	-0.105
	(0.010)***	(0.009)***	(0.010)***	(0.011)***
Tenure	0.025	0.017	0.013	0.019
	(0.003)***	(0.003)***	(0.003)***	(0.003)***
(Tenure)^2	-0.022	-0.011	0.002	-0.016
	(0.008)***	(0.008)	(0.009)	(0.010)
Constant	6.257	6.365	5.105	5.129
	(0.083)***	(0.106)***	(0.706)***	(0.675)***
Years Dummy	Yes	Yes	Yes	Yes
Big City Dummy	Yes	Yes	Yes	Yes
Size of Company Dummy	No	Yes	No	Yes
Job Type Dummy	No	Yes	No	Yes
R^2	0.19	0.30	0.04	0.06
N	11,024	9,348	11,024	9,348

* $p<0.1$; ** $p<0.05$; *** $p<0.01$.

Standard error is noted in brackets.

Table 6: Result (The division of household hypothesis)

	Full-time Housewife		Education (Husband＞Wife)	
	(9)	(10)	(11)	(12)
Model	OLS	FE	OLS	FE
Explained Variable	Log Wage	Log Wage	Log Wage	Log Wage
Married	0.139	-0.057	0.172	-0.024
	(0.039)***	(0.047)	(0.039)***	(0.055)
Duration of Marriage	0.003	-0.002	0.002	-0.002
	(0.002)*	(0.003)	(0.002)	(0.003)
Child under 6 years old	-0.069	-0.028	-0.054	-0.024
	(0.026)***	(0.025)	(0.025)**	(0.025)
Married × Full-time Housewife	0.066	0.025		
	(0.020)***	(0.020)		
Married × Education (Husband＞Wife)			0.006	-0.102
			(0.026)	(0.082)
Years of Education	0.027	—	0.027	—
	(0.005)***	—	(0.005)***	—
Years of Experienced	0.028	0.135	0.027	0.130
	(0.004)***	(0.031)***	(0.004)***	(0.031)***
(Years of Experienced)^2	-0.059	-0.105	-0.056	-0.106
	(0.009)***	(0.011)***	(0.009)***	(0.011)***
Tenure	0.018	0.018	0.017	0.019
	(0.003)***	(0.003)***	(0.003)***	(0.003)***
(Tenure)^2	-0.012	-0.014	-0.011	-0.015
	(0.008)	(0.010)	(0.008)	(0.010)
Constant	6.373	4.981	6.371	5.118
	(0.106)***	(0.691)***	(0.109)***	(0.675)***
Years／Big City	Yes	Yes	Yes	Yes
Size of Company／Job Type	Yes	Yes	Yes	Yes
R^2	0.30	0.06	0.30	0.06
N	9,273	9,273	9,348	9,348

* p<0.1; ** p<0.05; *** p<0.01.

Standard error is noted in brackets.

Table 7: Variable Explanation

Explained Variable	
Wage per hour (JPY)	Hourly wage.
Individual Information	
Age	Each survey year minus born year.
Married	Equal 1 if married and equal 0 if single.
Child under 6 years old	Equal 1 if having a child under 6 years old and equal 0 otherwise.
Educational Information	
Years of education	Calculated from history records (15～68 years old).
Junior high school	Equal 1 if highest graduated school is junior high school.
High school	Equal 1 if highest graduated school is high school.
Vocational school	Equal 1 if highest graduated school is vocational school.
University	Equal 1 if highest graduated school is university.
Graduate	Equal 1 if highest graduated school is graduated school.
Working Information	
Years of experience	Calculated from history records (15～68 years old).
Tenure	Tenure from first survey year and add or change length from "change a job" information in each survey year.
Size of Company	Equal 1 if company size is more than 500 people.
Area Information	
Living in big city	Equal 1 if the city is the one of 14 big cities.
Year Dummy	Equal 1 for each year. Base year is 2004.