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## **Career, Family, and Economic Risks**

— a quantitative analysis of gender gap in post-divorce life—

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# **Career, Family, and Economic Risks: A Quantitative Analysis of Gender Gap in Post-Divorce Life**

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## **Abstract**

This paper estimates the economic risk that is latent in a peaceful marital life but will surface when the marriage ends. The main focus is on the gender effect on equivalent household income among divorced people. Chief independent variables are continuous regular employment during marriage and presence of young child, with pre-marriage occupational/educational status as control variables. Results indicate strong negative effect of presence of child under 13 and discontinuous career, which expose women to risk of poverty.

**Key words and phrases:** marriage, career, children

## **1. Introduction**

The modern family has been expected to be an altruistic community to keep the same standard of living among its members. In particular, the social norm and the family law have provided unlimited special responsibility of mutual support between a married couple (Nakagawa 1928, p. 15). As far as this “normative altruism” functions properly, the family members can enjoy an equal living standard.

However, normative altruism does not cover the family members’ life after dissolution of family relation. This is the reason why the modern family has been blamed for failing in realizing equality among the members, or even for creating inequality.

This is an issue of gender inequality. It is well known that many women suffer the poverty after they divorced. There has been long debate on how we should reduce the economic risk in women’s post-divorce life. There has accordingly been a slow development in the family law and the welfare system, such as financial provision on divorce, payment for child support from the parent without custody, public child allowance, and social security for lone-mother household. The majority of family law scholars today agrees that the outcome of marital life should be equitably liquidated on

divorce, including the effect of specialization within the household and responsibility for bringing up their children (Motozawa 1998).

In contrast to the development in the law/policy debate, empirical study of post-divorce life has been inactive. There has been no quantitative study on the gender gap in post-divorce life. Thus we do not know to what extent men and women are different in the economic risk of marriage dissolution and what factors determine the gender gap. We attempt in this paper to measure the economic gender inequality in post-divorce life and to make a decomposition of the effects of factors.

## 2. Literature Review

Japanese family law provides that every divorce should be notified to the local government. The Government of Japan has filed notified divorces as a section of *Vital Statistics* (Ministry of Health and Welfare 2000). This statistics is a reliable official source about frequency of divorce and basic demographic variables of divorced people. But it is not useful for our purpose, because it includes no detailed social/economic status data.

Another data source is follow-up surveys of divorced people sampled from those submitted the notification of divorce to a local government (Ministry of Health and Welfare 1999). Such data does not include long-run change in economic status and effects of pre-marriage variables.

Recently sociologists and demographers conducted multivariate survival analysis using large-scale data from national representative sample to explore determinants of divorce. These studies do not analyze economic status after divorce, but they give some information about the effect of pre-marriage variables. Anzo (2003) analyzed Japanese General Social Survey 2000 (JGSS-2000) data (men and women) and found higher education has no clear effect on hazard of divorce. For effect of the wife's education, Fukuda (2005) analyzed Japanese Panel Survey on Consumers (消費生活に関するパネル調査) data (women only) and found hazard of divorce is higher for junior high school graduates, but little difference among high school, junior college, technical college, and university graduates. Kato (2005) analyzed the National Family Research of Japan in 2002 (NFRJS01) data (women only) and found that husbands' education and occupation before marriage have a significant effect. These findings suggest an indirect effect of pre-marriage human capital investment: It may effect on possibility of divorce and

thereby indirectly effects on post-divorce economic status.

Another data source is studies of lone-mother household. Since lone-mother household has been one of major targets of social policy (Iwata 2005), many scholars have conducted empirical studies. These studies often lack gender perspective, but they sometimes offer suggestions for exploring gender differences. Japan Institute of Labour (2003) conducted a project for secondary analysis of official statistics to establish policies promoting independence of lone-mothers. As a result from that project, Nagase (2004) suggested some conditions bringing about women’s economic difficulty in post-divorce life: (1) many women quitted regular employment and being nonemployed before divorced; (2) young children tend to be taken by mother; (3) it is difficult to reconcile between work and childcare. Fujiwara (2005) also suggests lone-mothers’ low education. Their risk of poverty after divorce could be determined by pre-marriage factors.

### 3. Data, Perspective, and Limitations

We use the Social Stratification and Social Mobility Survey in Japan, 2005 (SSM2005-J) data, version 14.2 distributed 2007-11-28.

Our analysis aims at measuring the gender gap in the standard of living in post-divorce life, focusing on how the family creates gender inequality. We should control pre-marriage variables such as educational/occupational status before marriage. To compare the standard of living of the respondents, we focus on household income, instead of personal income or wage rate.

Table 1 Marital status by sex and age

	Unmarried	Married	Divorced	Widowed	Total	(N)
Male						
20–29	78.9	20.1	1.1	0.0	100.0	(284)
30–39	32.5	65.8	1.6	0.0	100.0	(489)
40–49	14.8	80.4	4.2	0.6	100.0	(521)
50–59	8.9	84.0	5.2	1.9	100.0	(630)
60–70	2.5	89.5	4.7	3.3	100.0	(725)
Total	20.2	74.6	3.8	1.5	100.0	(2649)
Female						
20–29	67.7	31.1	1.2	0.0	100.0	(344)
30–39	19.2	75.3	5.5	0.0	100.0	(562)
40–49	3.9	88.1	6.8	1.2	100.0	(587)
50–59	3.7	86.6	5.7	4.1	100.0	(789)
60–70	1.8	76.5	5.0	16.7	100.0	(796)
Total	13.2	76.0	5.2	5.6	100.0	(3078)

Table 1 shows distribution of marital status broken down by sex and age. “Married” (those having the spouse) is majority, except that “unmarried” is majority for 20s. “Divorced” comprises only 3.8% of men, 5.2% of women.

Note that the “divorced” category does not include those who remarried. According to the 2004 National Family Research in Japan (NFRJ03), 4.3% of men and 3.1% of women had been remarried after divorce (Kambara 2006, p. 125). The SSM2005-J questionnaire has no question on the experience of divorce. Therefore it cannot tell the first marriage from remarriage. If a respondent had divorced and then remarried, she or he will be recorded as only “married”. This is a limitation of the SSM data.

#### 4. Pre-marriage Variables and Current Marital Status

The SSM2005-J data includes two important variables about social/economic status before marriage—education and occupational career.

	Unmarried	Married	Divorced	Widowed	Total	(N)
Male						
Compulsory	12.8	78.1	6.5	2.6	100.0	(429)
Secondary	19.7	75.3	3.3	1.6	100.0	(1359)
Higher	24.5	71.6	3.1	0.7	100.0	(860)
Total	20.2	74.6	3.8	1.5	100.0	(2648)
Female						
Compulsory	3.6	76.3	6.7	13.4	100.0	(524)
Secondary	11.2	78.0	5.7	5.1	100.0	(1847)
Higher	25.8	70.5	2.6	1.1	100.0	(705)
Total	13.2	76.0	5.2	5.6	100.0	(3076)

Table 2 shows association between education and marital status. Possibility of being divorced is higher for those with low educational status. Among those who received only compulsory education (junior high school graduates), the ratio of divorced people is higher than 6%. In contrast, among those who graduated higher education (junior college, technical college, or university graduates), the ratio is 3% or less.

We also focus on the first job before marriage. If the respondent entered the first job in the occupational history before both of marriage and childbirth, it is regarded as the “first job before marriage”. We use occupational classification derived from Hara and Seiyama’s (2005, pp. 172–73) eight categories of “general classification scheme”, but we combine all self-employed categories into one category, introduce “non-regular employee” as an independent category, and add the “no job” category (i.e., no job

experience before marriage). Definitions are in Table 3. Table 4 shows association between the first job before marriage and marital status.

We confirm the effects of pre-marriage variables using logistic regression of marital status (Table 5). Education has a significant effect that reduces the probability of being divorced, both for men and for women. Occupational categories have no effect on marital status except that “no job” has a positive effect on divorce.

Table 3 Job classification

Label	Definition
No job	No occupation or student
Self-employed	Self-employed, freelance, family worker, company president, or agricultural
Non-regular employee	Part-time, temporary, dispatched, short-term contract, or home pieceworker
Professional	Professional regular employee
WC in large firm	White-collar regular employee in large firm or in government
WC in small firm	White-collar regular employee in small firm
BC in large firm	Blue-collar regular employee in large firm or in government
BC in small firm	Blue-collar regular employee in small firm

Large firm: with 300 workers or more. Small firm: with less than 300 workers

White-collar: managerial, clerical, and sales. Blue-collar: skilled, semi-skilled, unskilled.

Occupational categories are based on the 8 categories of the broad SSM occupational strata scheme (SSM 職業大分類). The SSM2005-J data have seven newly defined categories in 3-digit detailed code (701–707), which were mapped to that strata scheme. As for managerial occupations, I converted the SSM2005-J data to make it conformable to the coding scheme of the SSM1985 data. See 1995 SSM Research Group (2006, pp. 101–5) and 2005 SSM Research Committee (2007, pp. 89–94)

Table 4 Marital status by the first job before marriage

	Unmarried	Married	Divorced	Widowed	Total	(N)
Male						
No job	41.0	49.4	6.4	3.2	100.0	(156)
Professional	19.0	78.3	1.9	0.8	100.0	(263)
WC in large firm	13.7	82.2	3.0	1.1	100.0	(467)
WC in small firm	19.5	74.7	5.1	0.7	100.0	(277)
BC in large firm	17.1	78.2	3.8	0.9	100.0	(340)
BC in small firm	20.1	73.5	4.1	2.3	100.0	(608)
Self-employed	10.6	84.2	2.9	2.2	100.0	(273)
Non-regular employee	40.3	56.6	3.1	0.0	100.0	(196)
Total	20.2	74.7	3.7	1.4	100.0	(2580)
Female						
No job	12.1	72.7	6.9	8.3	100.0	(348)
Professional	15.3	77.8	3.4	3.4	100.0	(378)
WC in large firm	13.6	79.6	2.6	4.2	100.0	(530)
WC in small firm	10.8	77.7	6.1	5.4	100.0	(669)
BC in large firm	3.8	83.8	7.5	5.0	100.0	(160)
BC in small firm	10.0	78.1	5.2	6.7	100.0	(329)
Self-employed	8.2	78.1	4.1	9.6	100.0	(146)
Non-regular employee	31.2	57.7	5.0	6.0	100.0	(317)
Total	13.7	75.7	5.0	5.7	100.0	(2877)

Table 5 Logistic regression of marital status (divorced/married)

	Male		Female	
Constant	-1.916*	(0.892)	-0.223	(0.850)
Age (20-70)	0.006	(0.009)	-0.011	(0.008)
First job before marriage <sup>(a)</sup> (Reference: BC in small firm)				
No job	1.094**	(0.407)	0.583+	(0.337)
Professional	-0.325	(0.544)	-0.002	(0.402)
WC in large firm	-0.113	(0.367)	-0.349	(0.388)
WC in small firm	0.433	(0.360)	0.439	(0.313)
BC in large firm	-0.024	(0.354)	0.288	(0.403)
Self-employed	-0.480	(0.416)	-0.163	(0.492)
Non-regular employee	0.072	(0.469)	0.482	(0.372)
Education <sup>(b)</sup>	-0.115*	(0.053)	-0.183**	(0.054)
-2 log likelihood	481.186		658.003	
$\chi^2$ (degree of freedom)	19.990*	(9)	27.396**	(9)
Frequency (divorced/married)	(95/1927)		(142/2176)	

Coefficient (standard error). \*\*:  $p < 0.01$ . \*:  $p < 0.05$ . +:  $p < 0.1$ .

(a) See Table 3. (b) Years of standard requirements.

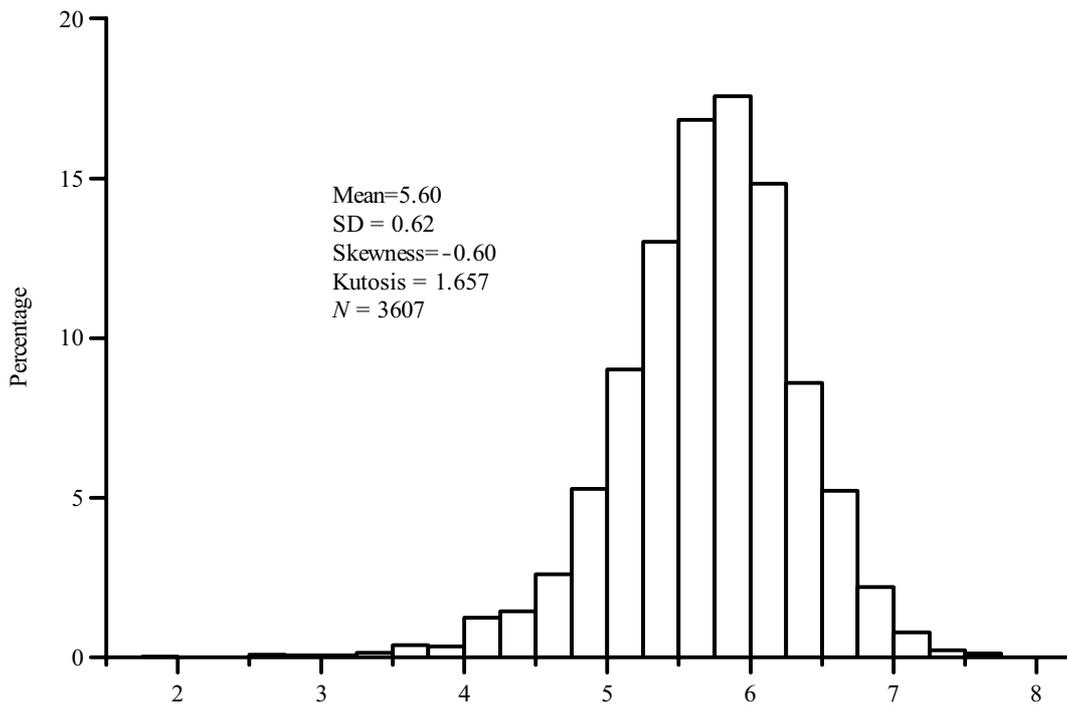


Figure 1 Distribution of logged equivalent household income

## 5. Distribution of Equivalent Household Income

We focus on household income to investigate differentials in living standard. However, household income is not comparable, because needs for money differ by household size.

We converted household income to equivalent scale. Let  $h$  and  $l$  denote the upper limit and lower limit of the chosen class for household income question (in a unit of 10,000 yen). And let  $n$  denote the number of household members. Then

$$\text{Equivalent household income} = \frac{h+l}{2\sqrt{n}}$$

Equivalent household income has a skewed distribution, with median of 3,000,000 yen. To normalize it, we take natural logarithm. The distribution is on Figure 1.

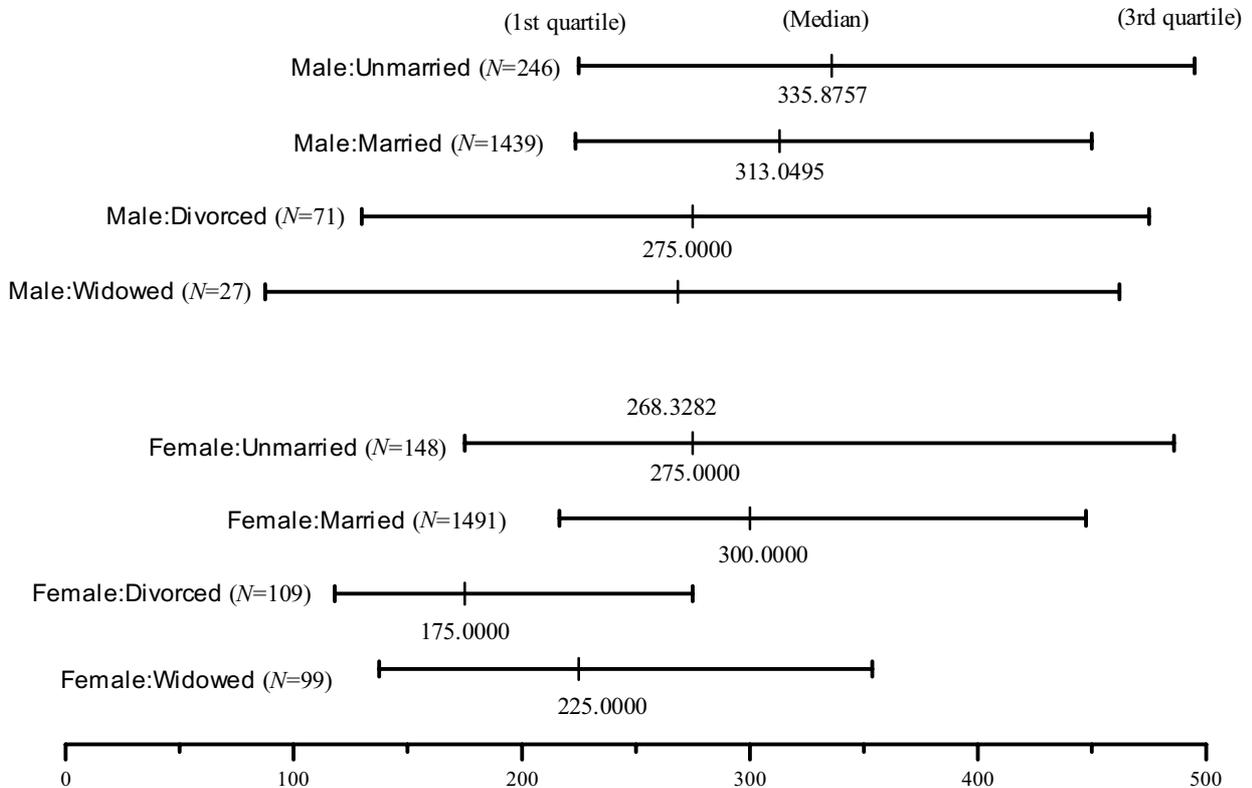


Figure 2 Sex, marital status, and equivalent household income (10,000 yen)

Table 6 Equivalent household income by household size

	Mean	Standard deviation	(N)
1	5.49	0.84	(275)
2	5.72	0.65	(929)
3	5.74	0.62	(883)
4	5.73	0.52	(773)
5	5.70	0.55	(411)
6	5.58	0.60	(221)
7+	5.59	0.56	(115)
Total	5.70	0.62	(3607)

After taking natural logarithm (see Figure 1).  $R^2 = 0.014$

Table 7 Age of the youngest unmarried child (only for divorced)

Sex	No unmarried child	0–5	6–11	12–17	18+	Total	(N)
Male	78.0	1.0	4.0	4.0	13.0	100.0	(100)
Female	48.7	6.3	11.4	12.7	20.9	100.0	(158)
Total	60.1	4.3	8.5	9.3	17.8	100.0	(258)

Table 6 shows difference in logged equivalent household income by household size. There is no clear correlation, although the income is slightly lower in one-person household and in large-size household with 6 people or more.

Figure 2 show median and quartiles of equivalent household income by sex and marital status. We find median for women is lower than that for men except for “married” people. The gender gap is greater among divorced people: men’s median (2,750,000 yen) is higher by 1,000,000 yen than women’s (1,750,000 yen). We should also pay attention to the greater gender difference of the third quartile and the smaller difference of the first quartile among divorced people.

## 6. Economic Status of Divorced People

In this section we restrict our analyses to divorced people.

Table 7 shows gender difference in presence of children and children’s age. There is a strong association between sex and presence of children: 78.0% of divorced men do not have unmarried child, while 51.3% of divorced women have unmarried child. We also find that the 17.7% of divorced women have children aged 11 or younger; only 5.0% of men do so.

Table 8 is a mobility table between the first job before marriage and the job at the last childbirth. We followed Tanaka’s (1998, 1999) method for determination of the timing and classification of employment status for Table 8. This table reveals a clear gender difference. Men tend to continue regular employment: 41 from total of 65 (=63.1%)

had a continuous career as regular employee. In contrast, only 16 from total 126 women (=12.7%) did so. A majority of women had no job at the last childbirth: 72/126 (=57.1%).

Table 8 Mobility table from the first job before marriage to the last childbirth

First job before marriage	Job at the last childbirth				Total
	Regular employee	Non-regular employee	No job	Self-employed	
Male					
Regular employee	41	0	0	10	51
Non-regular employee	3	0	0	0	3
No job	2	0	2	0	4
Self-employed	2	0	0	5	7
Total	48	0	2	15	65
Female					
Regular employee	16	13	54	12	95
Non-regular employee	2	2	8	2	14
No job	0	2	9	2	13
Self-employed	2	0	1	1	4
Total	20	17	72	17	126

Only for divorced and having a child

Table 9 Contribution to household income (only for divorced)

	$c = 0$	$0 < c \leq 0.25$	$0.25 < c \leq 0.5$	$0.5 < c \leq 0.75$	$0.75 < c < 1$	$c = 1$	Total	(N)
Male	4.8	0.0	7.9	14.3	7.9	65.1	100.0	(63)
Female	3.7	4.6	11.1	5.6	10.2	64.8	100.0	(108)
Total	4.1	2.9	9.9	8.8	9.4	64.9	100.0	(171)

$c$ : contribution to household income

Table 9 shows contribution of the respondent to household income. Contribution is defined as the respondent's personal income divided by household income. In some cases this contribution exceeds 1; for such cases we assigned contribution = 1. From Table 9, we find majority of divorced people is "breadwinner". More than 60% earn all income for her/his household. There is no great gender difference for this figure.

We conduct a regression analysis (Table 10) to explore the effect of these factors. Model 1 is a simple model with only independent variables of age and sex: Sex has a significant negative effect on equivalent household income (-0.445). We add pre-marriage occupation and education in Model 2: Education has a significant positive effect of increasing income (0.078). In Model 3 we added characteristics of household composition: Children under 13 reduce equivalent household income (-0.839). Model 4 is the final model, with variables about career and about household economies added: Continued regular employment has a significant positive effect (0.354). The direct effect of sex decreases as the model is developed (-0.445, -0.305, -0.282, and -0.155), the effect is taken over by presence of child under 13 and by continuous career as regular employee. In Model 4, sex no longer has significant effect.

Table 10 Regression analysis of logged equivalent household income for divorced people

	Model 1		Model 2		Model 3		Model 4	
Constant	5.934**	(0.219)	4.882**	(0.412)	5.062**	(0.434)	4.781**	(0.487)
Age (Reference: 60–70)								
20–29	–0.068	(0.354)	–0.265	(0.374)	0.180	(0.377)	0.264	(0.375)
30–39	0.122	(0.203)	–0.032	(0.209)	0.345	(0.227)	0.386 <sup>+</sup>	(0.227)
40–49	0.295 <sup>+</sup>	(0.156)	0.115	(0.163)	0.287 <sup>+</sup>	(0.170)	0.330 <sup>+</sup>	(0.169)
50–59	0.105	(0.161)	–0.048	(0.172)	–0.069	(0.174)	–0.024	(0.173)
Sex <sup>(a)</sup>	–0.445**	(0.124)	–0.305*	(0.134)	–0.282*	(0.135)	–0.155	(0.146)
Education <sup>(b)</sup>			0.078*	(0.031)	0.070*	(0.029)	0.075*	(0.029)
First job before marriage <sup>(c)</sup> (Reference: BC in small firm)								
No job			–0.060	(0.222)	0.000	(0.212)	0.051	(0.216)
Professional			–0.019	(0.264)	0.006	(0.254)	–0.062	(0.253)
WC in large firm			0.097	(0.258)	0.079	(0.246)	0.048	(0.244)
WC in small firm			–0.165	(0.211)	–0.123	(0.202)	–0.110	(0.200)
BC in large firm			0.399 <sup>+</sup>	(0.236)	0.358	(0.226)	0.325	(0.228)
Self-employed			0.297	(0.296)	0.261	(0.282)	0.370	(0.284)
Non-regular employee			0.062	(0.247)	0.050	(0.239)	0.123	(0.238)
One-person household					–0.172	(0.156)	–0.097	(0.184)
Having child under 13 (1 or 0)					–0.839**	(0.200)	–0.818**	(0.213)
Extended household <sup>(d)</sup> (1 or 0)					–0.124	(0.197)	–0.097	(0.196)
Continued regular employment <sup>(e)</sup> (1 or 0)							0.354*	(0.161)
Contribution to household income (0–1)							–0.162	(0.263)
R <sup>2</sup>	0.095		0.179		0.273		0.299	

Coefficient (standard error). \*\*:  $p < 0.01$ . \*:  $p < 0.05$ . +:  $p < 0.1$ .  $N = 159$ .

(a) Male=1; Female=2. (b) Years of standard requirements. (c) See Table 3.

(d) 1 for co-residence with non-relative or relative except child, grandchild, and their spouse.

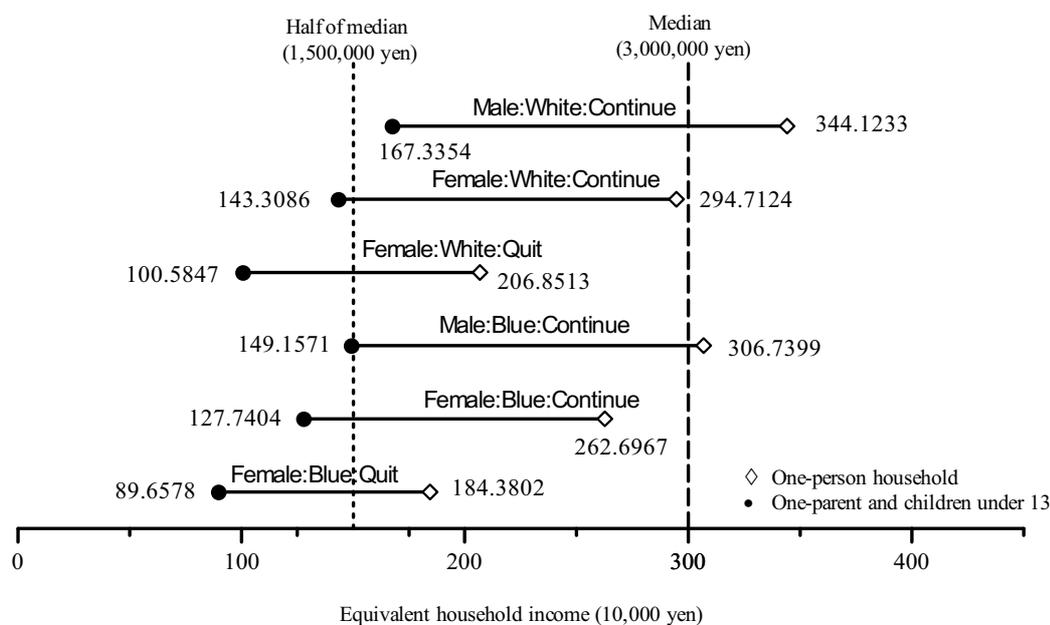
(e) 1 for stayers in the “regular employee” category in Table 8; 0 for the others including those with no child.

## 7. Discussion

We detected a great gender gap in post-divorce life after controlling pre-marriage educational/occupational status. Our regression analysis (on Table 10) reveals that the gender effect is mediated by presence of young child and discontinuity in occupational career.

Coefficient for presence of young child is estimated as  $-0.818$  (Model 4 in Table 10). This means that the income will be reduced to 44% ( $\exp -0.818 = 0.441$ ) if having a child under 13 years old. This effect equates the effect of 10.9 years of school education.

Coefficient for continued regular employment is estimated as 0.354. This means that the income will increase 1.4 times ( $\exp 0.354 = 1.424$ ) if continued regular employment during marriage. This effect equates the effect of 4.7 years of school education.



Conditions are on Table 11

Figure 3. Estimated household income for model cases

Table 11 Assigned values for estimation

Variables	“Blue”	“White”
Age	40s	40s
Sex	1 or 2	1 or 2
Education	Junior high school (=9)	High school (=12)
First job before marriage	BC in small firm	WC in small firm
One-person household	0 or 1	0 or 1
Having child under 13	0 or 1	0 or 1
Extended household	0	0
Continued regular employment	0 or 1	0 or 1
Contribution to household income	1	1

After controlling these effects, the direct effect of sex is not statistically significant (though the sign of its coefficient is negative). This suggests that the gender inequality in post-divorce life is mainly attributable to the gender difference in custody of young children and in continuity of occupational career. As we have seen, in most cases of

couples with young children, the mother has lived with the children after divorce (Table 7). And many women quitted their job during marriage (Table 8). These differences cause the gender gap.

Figure 3 shows estimated income for some model cases (Table 11). We estimate equivalent household income by assigning values into the equation of Model 4 in Table 10. The broken vertical line indicates the median of equivalent household income for all cases (3,000,000 yen). The dotted vertical line indicates a half of the median (1,500,000 yen), which is often used as the relative poverty threshold (OECD 2001, p. 41).

Figure 3 demonstrates a great effect of having a young child and of quitting regular employment. If a divorced man lives in one-person household, he can live a middle level of living standard. This holds for a divorced woman (though the level is slightly lower than men), if she has continued regular employment. However, if he or she has a young child, the estimated income will be lower, near (or under) the relative poverty threshold of 1,500,000 yen. Quitting regular employment has also a negative effect. If these two conditions simultaneously hold, her annual equivalent household income will be 1,000,000 yen or less.

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