Socio-economic status, gender, and spouse's earnings: affect of family background on matching.

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ABSTRACT

This paper uses individual level data (the Japanese General Social Surveys 2000-2003) to examine how socio-economic status influences own and spouse's earnings. After controlling for own and spouse's characteristics such as human capital and age, I found: (1) childhood economic condition considered as socio-economic status is not associated with own income for both males and females. (2) The better a female's childhood economic condition was, the higher her husband's income. On the other hand, a male's childhood economic condition was not related to his wife's income. This suggests that social stratification persists through marriage for females but not for males.

Key words: Status, identity of genders, spouse's income, marriage market.

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1. Introduction.

Since the seminal work of Akerlof and Kranton (2000), researchers have increasingly given attention to the question how identity affects economic outcomes (e.g., Almenberg and Dreber 2009; Booth and van Ours 2009; Chen and Li 2009). Akerlof and Kranton (2000) proposed a utility function where one's identity or self-image are included. One's identity depends on one's assigned social categories. For instance, in the labor market, "Occupations are associated with the social categories 'man' and woman' and individual payoffs from different types of work reflect these gender associations" (Akerlof and Kranton 2000, 732). Hence, an individual is considered to choose the occupation that matches his/her gender. With respect to household division of labor, traditional theory indicates that, based on comparative advantage, a person who does more house work will do less market work, regardless of gender (Becker 1965). On the other hand, because of gender identity, though "a wife works more hours outside the home, she still undertakes a larger share of the housework" (Akerlof and Kranton 2000, 745). If this is the case, there is a likelihood that a female is specialized in house work even if a female does not have comparative advantage over a male in house work. Booth and van Ours (2009) term the former the *gender neutrality hypothesis* and the latter the *gender identity hypothesis*. Booth and van Ours (2009) provided evidence as follows: A husband's life satisfaction is positively associated with his working hours but not with his wife's working hours, whereas a wife's life satisfaction is negatively associated with her working hours but positively associated with her husband's working hours. This is consistent with the *gender identity hypothesis*.

Identity seems to play a critical role in the selection of mates in the marriage market. According to Mailath and Postlewaite (2006), the value of an asset is determined in the social context. Thus, assets that have little (or no) value in some societies may have a positive value in others. They defined the attributes of an agent

that has value only because of social institutions (social circumstances) as social assets. Therefore, in the marriage market, not only wealth but also nonproductive attributes affect matching. If social context is not taken into account, "wealthy men match only with wealthy women and vice versa. When social institutions value an attribute such as blue eyes, some wealthy brown-eyed people match with less wealthy with blue eyed people." (Mailath and Postlewaite 2006, 1059). What is more, if gender identity is important, such matching is not thought to be symmetric in the marriage market. For instance, a blonde female with blue-eyes and seems more attractive and valuable than a male with such characteristics. If so, wealthy brown-eyed males are more inclined to match with less wealthy blonde blue-eyed females, whereas wealthy brown eyed females are less likely to match with blonde blue-eyed males.

Under the condition that females work less in the labor market because of gender identity or social norms, young females are likely to invest in "social assets" that are valuable in the marriage market, rather than in skills that increase marginal productivity in the labor market. To finance this, parental income plays a critical role and so females with rich parents will become valuable in the marriage market. Furthermore, even if parents do not finance "social assets", a female raised in a rich family is likely to learn "social assets" matched to a high earner from her mother.

Although modern Japan is considered a developed country, family background still seems to be associated with individual decision making such as marriage and choice of spouse[1]. Family background, which is considered a kind of individual identity, includes not only relative's human capital, but also socio-economic status. Socio-economic status seems considered as a kind of social asset. It is plausible that socio-economic status such as nobility is difficult to be obtained through market transactions but influences

[1] For instance, in Japan, men raised by full-time working mothers are less likely to support a traditional gender role and so are more likely to get marry with full-time female workers (Kawaguchi and Miyazaki 2008).

economic behavior[2]. Almenberg and Dreber (2009) found that a person with high earnings but not nobility will acquire nobility through marriage; however, this is not influenced by gender. Nevertheless, Almenberg and Dreber (2009) did not incorporate the same critical variables such as proxies for social circumstance or social institutions, leading to their estimation results suffering from bias. How is an individual's identity associated with one's own and spouse's earnings? Furthermore, how does gender influence this relationship? Few researchers have investigated these questions. This paper attempts to explore these issues using the individual level data from Japan, by using Japanese General Social Surveys (hereafter, JGSS) data. After controlling for social circumstance and own and spouse's characteristics such as years of schooling and age, it was found that males with higher earnings are more likely to match with females who were raised under better economic conditions during childhood, while a male's childhood economic condition is not related to a female's earnings.

The organization of this paper is as follows: Section 2 presents a brief survey of the related literature. Section 3 gives an overview of the labor and marriage markets in Japan. Section 4 presents a description of the data set and a simple econometric framework to examine the effect of one's family background on spouse's earnings. The results of the estimations and discussion are set out in Section 5. The final section offers concluding observations and notes issues remaining to be addressed.

2. Related literature.

Benham (1974), using U.S Census data for 1960, was the first to argue that besides individual human capital, a wife's human capital has a positive impact on a husband's earnings. The positive relationship between a wife's schooling and a husband's earnings

[2] Bisin and Verdier (2000) analyze the intergenerational transmission of ethnic and religious traits through family socialization.

has been found stable and to have persisted from 1960 to 2000 (Jepsen 2005)[3]. Family and community backgrounds are also thought to be associated with economic outcomes such as earnings and schooling (e.g., Behrman and Wolf 1984; Boulier and Rosenzweig 1984; Hauser and Sewell 1986; Corcoran et al., 1990, 1992)[4]. A male individual's, his parent's, wife's and wife parent's schooling are related to earnings (e.g., Heckman and Holtz 1986; Lam and Shoeni, 1993, 1994). The condition of the male labor market is different from that of the female, partly because of gender identity which is beyond the scope of traditional economics (Akerlof and Kranton 2000). Wong (1986) examined not only the effect of a husband's schooling but also that of a wife's on earnings. He found that a wife's schooling increased the husband's earnings regardless of the kind of work; while a husband's schooling increased a wife's earnings only for those who were employed independent of the family and not for family business workers. It follows from this that the effect of a male's education on his wife's earnings differs from that of the effect of a female's education on her husband's earnings.

Family background has an important role in socio-economic outcomes. For instance, the better the socio-economic condition during childhood, the higher one's earnings become (Corcoran et al., 1990, 1992). This tendency is more obvious in developing countries than developed ones (Behrman and Wolf 1984). This might partly be because of differences in interpersonal relationships and social structures between developed and developing countries. Nevertheless, identity is thought to be important in economic activity in developed countries (Akerlof and Kranton 2000). If individuals value income when they evaluate a partner, individuals with a high income encounter better partner

[3] The positive effect of a wife's human capital on a husband earnings is observed worldwide, for instance, in Israel (Neuman and Ziderman 1992), Iran (Scully 1979), Philippine (Boulier and Rosenzweig 1984), Malaysia (Amin and Jepsen, L., 2005), Brazil (Lam and Shoeni, 1993, 1994).

[4] Gender of children has an effect on a male's earnings and on labor supply (Lundberg and Rose 2002; Choi et al, 2008). Social interaction also plays a crucial role in the search for mates in the marriage market (Drewianka 2003).

availability. This is consistent with a marriage market characterized by positive assortative mating by income (Lam 1998). This seems to be valid if market conditions are similar between genders. However, features of the female labor market are thought to be different from that of the male one[5]. Generally female labor participation rates are lower than that of males. This is partly explained by a female's identity being enhanced by work inside the home (Akerlof and Kranton (2000)[6]. Even after taking a job, females are more likely to work more in lower-paying jobs than males (Kooreman 2009).

There are several factors relevant to the question of what do males regard as important when they select a mate. From the viewpoint of a division of labor, females are required to specialize in home production, rather than market work (Becker 1973, 1974). Considering the family background, a wife's non-wage income and intergenerational transfer of wealth seem to be important female's traits in the marriage market[7]. For instance, a Japanese father's income decreases his daughter's age at marriage (Anderson and Hill 1983), implying that wealth leads a daughter to be more valuable and thus can more easily find a mate in the marriage market.

Besides exhaustible monetary wealth, Almenberg and Dreber (2009) focus on socio-economic status when they explore the effect of inherited wealth on the selection of mates in the marriage market. Almenberg and Dreber (2009) presented evidence using Swedish data that individuals with high wealth but low status sorting with individuals with low wealth but high status. "when status is important, individuals would be willing to pay a lot in time, effort, and money for sufficiently high status" (Becker et al., 2005, 283)[8]. If so, how is status defined? It seems that status cannot be

[5] Fernández et al. (2005) present a theoretical model and indicate empirically that lower female participation in the labor market leads to greater marital sorting.
[6] Female labor participation depends on various economic factors such as human capital, wage rates, husband's income (e.g., Hill 1983, 1984, 1989; Sasaki 2002).
[7] Increased marital sorting is considered to increase income inequality (Fernández and Rogerson 2001; Fernández et al. 2005).
[8] In many works, status is put directly into the utility function (Fershtman and Weiss

induced solely and entirely by monetary wealth (Frank 1999). That is, "status is only partly determined by measurable differences in monetary compensation. Social, cultural, and other economic considerations that may be connected to a concern for relative position…are also important determinants" (Moldovanu et al. 2007, 355). As a consequence, in the marriage market, males will derive a benefit from their wife's inherited monetary wealth or non-monetary status, while females will receive benefits from their husband's income. Therefore, males with high earnings or a bright future are more likely to select females with large inherited wealth as mates.

3. verview of the Labor and Marriage Markets in Japan

The condition of the female labor market is thought to influence the selection of mates in the marriage market (Fernández et al. 2005). As for female labor market, "During the post World War II period, many large firms have practiced either formal or informal rules requiring that women retired from their jobs upon marriage" (Anderson and Hill 1983, 942). After the mid-1960s, however the "high court argu-ed that compulsory retirement upon marriage was against 'good order' as set forth in the Civil Code" (Anderson and Hill 1983, 942). More recently the social position of females has improved and females have become more influential in Japanese modern society. This change reflects the Equal Employment Opportunities Law for Men and Women, which was enacted in 1985 to improve employment opportunities for women. Nevertheless, based on JGSS data, the average income of single males is 320,000 yen, which is approximately 1.5 times higher than that of females, which is 246,000 yen. It was observed that the part-time employment ratio of married women increased over time (Abe 2009). Because of the 1.03 million yen ceiling on income before their spouse's tax

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1993; Hopkins and Kornienko 2004), when their theoretical model was constructed. Individuals with high status can attain higher prices as sellers, and lower prices as buyers (e.g. Ball et al., 2001).

rate is affected[9], married women tend to limit their annual earnings to no more than 1.03 million yen to receive benefits available to low-income wives (Akabayashi 2006; Abe 2009).

The female labor market conditions lead me to conjecture that females would like to select males with high earnings as mates to increase earnings. To put it in another way, females are inclined to increase earnings through the marriage market. On the other hand, a male does not attach importance to a female's earnings when he selects his mate. As argued earlier, if added to heritable wealth, non-monetary or non-productive "social assets" seem to be valuable for a male when he searches for a mate[10].

In Japan, marriages are classified into two types; modern 'love' (*ren'ai)* marriage and traditional 'arranged' (*miai*) marriage. A 'love' marriage is when individuals choose their own marital partners. An 'arranged' marriage is where parents and/or a third party act as an intermediary and arrange the marriage. Therefore, in the case of 'arranged' marriages, values of family and community play a significant role in the selection of a mate. Inevitably, "social assets" as determined in the social context, are considered important in the selection of a mate. Even in the case of a 'love' marriage, the intention of parents, to a certain extent, might be reflected in the choice of a mate. This is because a couple based on 'love' encounter difficulties in marriage if their families fail to approve (Hendry 1981, 116-122).

I see from Figure 1 (a) that a male's earnings are positively associated with his economic condition during childhood, whereas a female's are not. Figure 1 (b) shows

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[9] Married wives whose annual earnings are less than 1.03 million yen can receive a number of benefits as follows (Abe 2009): (1) They are eligible to for social security and health care benefits. (2) Their husbands can claim the "exemption for spouse" on husband's income tax return. (3) Their husbands often receive allowance for their spouses from their employers.

[10] It was observed from a case study of the labor market in Brazil that the schooling of a father-in law (wife's father) has a greater effect on a male's wages than the schooling of his father. Schooling seems to be positively related to socio-economic status. Hence, this result is in line with the argument of this paper.

that a female's childhood economic conditions are clearly positively associated with her husband's earnings, while a male's childhood conditions are not related to his wife's earnings. It is interesting to observe from Figure 1(b) that a male's earnings are more closely related to his wife's childhood condition than to his own. Three interpretations seem plausible: (1) A female's inherited monetary wealth is thought to be valuable for a male so that a female can be married into high earnings or a promising male in a competitive marriage market. (2) A female's non-monetary social assets have appeal for a male and therefore she can be matched with high earnings or a promising male. (3) A male can enjoy his wife's socio-economic status to increase his earnings. High socio-economic status is positively related to social networks within upper class society. Once a male is married to a female belonging to an upper class, he can enter this social network. For instance, a male can reduce transaction costs and get business opportunities through the social network of his wife's family.

Concerning the first interpretation; that allocated monetary wealth decreases as the number of a wife's siblings increases. Therefore, if economic conditions are equal, the value of a female declines in the marriage market as the number of her siblings increases. If the first interpretation is valid, a husband's earnings reduce as the number of siblings increases. Looking at Figure 2 reveals that the earnings of a husband whose wife has no siblings is larger than the earnings of a husband whose wife has siblings. This is consistent with the first interpretation. Now, let me proceed to more closely examine the relationship between a husband's earnings and a wife's socio-economic status.

4. Methods.

4.1. Data

This paper uses JGSS data, which are individual level data. The JGSS surveys

adopt a two-step stratified sampling method and were conducted throughout Japan between 2000 and 2002. JGSS is designed to be the Japanese counterpart of the General Social Survey in the United States. This survey asks standard questions concerning an individual's and his/her family characteristics through face-to-face interviews. This data covers information related to the one's marital and demographic (age and gender) status, level of income, years of schooling, age, number of children, job category[11], size of residential area, prefecture of residence, prefecture of residence at 15 years old, opinion about the role of gender within a household, and family back ground (parent's years of schooling, economic condition in childhood). In addition to these, a spouse's demographics (age and gender) status, job categories, and years of schooling[12] can be obtained. According to the population size of the geographical area, sampling points were divided into the three groups; (1) large cities, (2) other cities, and (3) villages and towns. The survey collected data on 8636 adults, between 20 and 89 years-old. Furthermore, this paper deals with the effects of a spouse's family background on income so that the sample is limited to married people. Hence the sample is reduced to 7368[13]. The variables used for regression estimations are shown in Table 1, which indicates mean values of each gender and his/her spouse.

With respect to the childhood economic conditions considered the key independent variables, the respondents were all asked: "Thinking about the time when you were about 15 years old, compared with Japanese families in general then, what would you

[11] Jobs are divided into 21 groups ; (1)agriculture, (2)forestry, (3) fishery, (4) mining, (5) building, (6) manufacture, (7) electricity, gas, water supply, (8) transporting, (9) wholesale, (10) retail sale, (11) restaurant, (12) finance, insurance, (13) real estate business, (14) Mass media, (15) information industry, (16) Medical industry, (17) education, (18) law and account, (19) other service industries, (20)public sector, and (21)others. Job category dummies were constructed based on these groups.

[12] Data for this secondary analysis, "Japanese General Social Surveys (JGSS), Ichiro Tanioka," was provided by the Social Science Japan Data Archive, Information Center for Social Science Research on Japan, Institute of Social Science, The University of Tokyo.

[13] Respondents did not completely respond to all questions, and therefore the number of samples used for the regression estimations range between 2445 and 3745.

say about your family income?". The possible responses to this question were "Far below average", "Below average", "Average", "Above average" and "Far above average". In modern Japan, 'wealth and income are becoming a more important factor for determining the social status of a household' (Hendry 1981, 136). Therefore, it is plausible to argue that these categories can be considered as socio-economic status, representing not only economic position but also social status. I see from Table 1 that the most frequent responses, about 38 %, are "Average" both for male and female. "Far below average" shows 0.09, whereas "Far above average" shows 0.01. This suggests that only 1 % of respondents stated "Far above average", considered the privileged class.

As referred to later, this paper uses as sample selection model, and opinion about the division of labor within a household is included as an independent variable only in the first stage. The opinion is measured by the following question. "Do you agree or disagree with the following statements? A husband's job is to earn money; a wife's job is to look after the home and family." The possible responses to this question were "Agree", "Somewhat agree", "Somewhat disagree" and "Disagree". The degree of agree on the division of labor is captured by a variable ranging from 1(disagree) to 4(agree). These question and responses seem to be the determinants of labor participation rather than the amount of earnings. Hence, this variable is incorporated as an independent variable only in the first stage.

4.2. Own income

I see from Table1 that a male's income (5.06) and years of schooling (11.8) are higher than a female's income (2.02) and years of schooling (11.5). This indicates that a difference in income between genders might be partly explained by the difference in human capital, although the difference in schooling is not large. Now I proceed to examine other factors influencing one's income after controlling for human capital. As

mentioned above, this paper examines the determinants for one's income when a person has a job. Restricting samples to those who have a job, therefore, a two-stage Heckman selection model is employed to control for any selection bias. Furthermore, this paper attempts to compare the determinants of income between males and females for the purpose of investigating gender identity in the labor and marriage markets. Thus, the sample is divided into male and female groups. Then using these samples, estimations are conducted. In line with the previous discussion, the first-stage estimated function of one's income takes the following form:

(Function A)

$$INCOM_{itmn} = \alpha_0 + \alpha_1 Schooling_{itmn} + \alpha_2 Father\ Schooling_{itmn} + \alpha_3 Mother\ schooling_{itmn} + \alpha_4 Age_{itmn} + \alpha_5 Cond(Below)_{itmn} + \alpha_6 Cond(Average)_{itmn} + \alpha_7 Cond(Above)_{itmn} + \alpha_8 Cond(Far\ above)_{itmn} + e_t + f_m + g_n + u_{itmn},$$

where *INCOM* represents one's income for individual *i*, year *t*, job category *m* and residence *n*. α's represents the regression parameters. e_t denotes year specific effects, which are captured by year dummies. f_m denotes the job specific effects, which are captured by job category dummies. g_n is the vector of the location characteristics: size of residential area[14], prefecture of residence, and prefecture of residence at 15 years-old. They are also captured by dummies. u_{itmn} represents the error term. It is plausible that job category is associated with level of income. Year dummies are included to control for the effect of macro economic shock on the labor market. Location characteristics are thought to capture various influential factors on income. Residence during childhood will capture how circumstances during childhood form a person's preferences (Kawaguchi and Miyazaki 2009). This is considered as the community background

[14] Edlund (2005) suggested that females are more likely to reside and work in urban areas than males for the purpose of searching for a mate in the marriage market. To control for this effect, size of residential area dummies are incorporated.

effect. It seems that various kinds of jobs are concentrated in urban areas and therefore there are immigrants from other areas. This concentration of certain job types leads to gaps in the income levels between urban and other areas[15].

Following existing literature, not only an individual's human capital and age but also his/her parents' human capital are included to capture the family background (e.g., Heckman and Holtz 1986; Lam and Shoeni, 1993, 1994). These variables are expected to take a positive sign since the accumulation of human capital improves an individual's marginal productivity. Childhood economic condition is thought to be related to the accumulation of human capital since it is easier for rich parents to invest in a child's schooling than it is for poor parents. Even after controlling for human capital, childhood economic condition appears to influence earnings. Childhood economic condition seems to be associated with the interpersonal social network within a social class. For instance, even if the level of human capital is the same between individuals, individuals belonging to a high social class are more likely to obtain a good job through their social network than others (Granovetter 1973; Montgomery 1991, 1992). Hence, better economic conditions during childhood lead to higher incomes then for those whose economic conditions during childhood were not so good.

The second stage estimation was presented as above. With respect to the first stage Probit estimation, the dependent variable is job dummies, which takes 1 when one has a job, otherwise 0. Added to the set of the dependent variables used in the second stage estimation, the following variables are incorporated as independent variables in the first stage. As mentioned before, an individual's opinion about the division of labor within a household is included as an independent variable. I also follow existing reports examining labor participation where the number of children before entering primary school was used as an independent variable (e.g., Hill 1983, 1984, 1989; Sasaki 2002).

[15] Females are more likely to reside in an urban area than males since females would like to get the chance to meet a better partner in the marriage market (Edlund 2005).

Hence, the number of children under age 6 is incorporated as an independent variable.

4.3. Husband and wife's income

(Function B)

$$Spouse\ INCOM_{itmn} = \alpha_0 + \alpha_1 Schooling_{itmn} + \alpha_2 Father\ Schooling_{itmn} + \alpha_3 Mother\ schooling_{itmn} + \alpha_4 Age_{itmn} + \alpha_5 Spouse\ Schooling_{itmn} + \alpha_6 Spouse\ age_{itmn} + \alpha_7 Cond(Below)_{itmn} + \alpha_8 Cond(Average)_{itmn} + \alpha_9 Cond(Above)_{itmn} + \alpha_{10} Cond(Far\ above)_{itmn} + e_t + f_m + g_n + u_{itmn},$$

To examine spouse's income, the function takes the form as above. *Spouse INCOM* is the dependent variable representing a spouse's income. In addition to the independent variables of (Function A), years of a spouse's schooling and spouse's age are incorporated as independent variables. A spouse's years of schooling and a spouse's age are expected to yield positive signs because a spouse's human capital leads to an increase in income. Following existing reports (e.g., Boulier and Rosenzweig 1984; Heckman and Hotz 1986; Lam and Shoeni 1993), one's and his/her parents' years of schooling are expected to become positive.

The key variables to examine how one's status influences spouse's income are the childhood economic condition dummies, such as *Cond(Below)*, *Cond(Average)*, *Cond(Above)*, and *Cond(Far above)*. Furthermore, their effects are different between genders if gender identity influences outcomes of the labor and marriage markets. As discussed above, a male's childhood economic conditions do not appear to be associated with his wife's income. This is the reason why a male does not think much about a possible partner's income when he searches for a mate, whereas a female does focus on a possible partner's income rather than his socio-economic status. However, a female's childhood economic conditions are thought to be positively related to her husband's

income. Hence, signs of childhood economic condition dummies are predicted to be positive when a husband's income is examined. What is more, the values of the coefficients become larger as childhood economic conditions improve. The reason is that a female considers a possible partner's income when she searches for a mate. Males consider a partner's socio-economic status important.

As for the first stage, as explained for the first stage of Function A, in addition to the second stage variables, opinion about the division of labor within a household and the number of children under age 6 are incorporated as independent variables.

What is more, for the purpose of examining whether the amount of monetary wealth is associated with the selection of a mate, added to above mentioned variables, the number of siblings is incorporated in other estimations. If all else is equal, allocated monetary wealth (inheritance) decreases as the number of children increases. Hence, the number of siblings is expected to produce negative signs if monetary wealth is associated with a spouse's income.

5. Results.

5.1. Own income

Table 2 sets out the results regarding one's income. In table 2, the results of a male's income are presented in columns (1)-(4) and those of a female's in columns (5)-(8). The results of using all independent variables are seen in columns (1) and (5). In the first stage, opinion about division of labor within a household seems to lead to an endogenous bias. Hence, opinion about division of labor within a household is omitted in columns (2), (4), (6) and (8).

As anticipated, one's years of schooling yields positive signs, and is statistically significant at the 1 % level. Furthermore, absolute values of the coefficients of males are nearly two times larger than those of females. This implies that a male's human capital

has a greater positive effect on income than a female's. This might be partly to the result of discrimination against females in the labor market. Concerning parent's years of schooling, the signs of a father's years of schooling are positive in all estimations. They are statistically significant in columns (3) and (4) when a male's income is estimated, they are significant only in column (7) when a female's income is estimated. Furthermore, their absolute values for males are larger than those for females. Thus, a father's human capital makes a larger contribution to a male's income than a female's one. As for a mother's years of schooling, they yield unexpected negative signs, suggesting that a mother's human capital does not make a contribution to an increase of income.

With respect to childhood economic conditions, when I look at the results of males, moving from the "Below average" to the "Far above average" group, the estimated coefficients increase monotonically. These dummies are, however, not statistically significant, with the exception of the "Above average" dummy. This suggests that childhood economic conditions are not significantly associated with a male's income. From this I derive the argument that males with high socio-economic status fail to enjoy the benefits of a social network to increase their earnings. In other words, the social network does not have an important role in increasing earnings. Concerning females, signs of the coefficients are mostly negative and statistically insignificant, although the "Far above average" dummy yields a significant positive sign. This implies that childhood economic condition is not systematically related to a female's income even though females belonging to a privileged class are more likely to earn good incomes. All considered, after controlling for human capital, childhood economic conditions do not lead to an increase of income for males and females.

I now turn to the results of the first stage estimations. The significant negative signs of the number of children under 6 years old means that parents are required to allocate

time for child care. This reduces the likelihood of their full labor participation. Furthermore, the absolute values for females are about two times larger than those for males. As for opinion about the division of labor within a household, its coefficients show negative signs and are statistically significant at the 1 % level for females. Overall, these results indicate that differences of gender identity have an important role in labor participation.

5.2. Husband and wife's income

Table 3 sets out the results regarding a spouse's income. In table 3, the results of a wife's income are presented in columns (1)-(4) and those of a husband's in columns (5)-(8). The results of using all independent variables are seen in columns (1) and (5). Corresponding to Table 3, opinion about the division of labor within a household is omitted in columns (2), (4), (6) and (8).

As for human capital, the effect of own years of schooling on spouse's income yield positive signs and are statistically significant at the 1 % level for males and females. There are two arguments about the interpretation of the positive effect of a partner's human capital (Benham 1974; Jespen 2005): (1) the productivity argument (the positive effect resulting from an own investment in one's spouse's human capital), (2) the assortative mating argument (the positive effect because better-educated individuals marry more productive partners). Using U.S. Censuses data from 1960 to 2000, Jespen (2005) found that a wife's education increases her husband's earnings but this positive effect decreases over time. She interpreted this result as suggesting that "women are using their education to benefit their own careers rather than to enrich careers of their husbands" (Jespen 2005, p.210). Generally, a males is less likely to use his education to enrich his wife's career, because of gender identity. If this is the case, the productivity argument cannot be supported when the effect of a male's years of schooling on a

female's earnings is considered. Therefore, the assortative mating argument seems to be valid when I interpret the positive sign of the effect of a male's years of schooling on his wife's earnings. It is interesting to observe that signs of own parents' and wife's years of schooling on wife's earnings do not become positive in most cases. On the other hand, signs of own parents' and husband's years of schooling on husband's earnings become significant positive in all cases. These results are thought to reflect the difference of labor market conditions between males and females.

With respect to childhood economic conditions, 'Far above average' indicates negative signs although other dummies show positive signs when a wife's income is examined. They are not statistically significant in all results. This implies that a male's conditions are not systematically associated with his wife's earnings. On the other hand, it is surprising that a woman's childhood economic conditions are positively related to her husband's income, while being statistically significant in all estimations. Furthermore, the values of coefficients become larger as childhood economic conditions improve. Especially, the coefficients of 'Far above average' are approximately 1.5 times larger than 'Above average', suggesting that females belonging to the privileged class continue to be super rich after marriage. As discussed in the results of Table 2, males do not enjoy social networks formed by his socio-economic status when he earns income. Therefore, a wife's family's social network is not thought to influence her husband's productivity in the labor market. That is, marriage is not less likely to influence the amount of a male's earnings. Hence, I interpret the above results as suggesting that more promising males or high earners are more likely to marry females belonging to high socio-economic classes.

An individual's childhood economic conditions are considered to relate to his/her adulthood economic conditions. One who was brought up in a rich family will receive a large inheritance from their parents. Therefore, it is not clear that a female's economic

conditions capture her social status or heritable wealth in the marriage market. I now examine how an inheritance affects the outcome in the marriage market. I see from Table 4 that the number of siblings exhibits negative signs in all estimations[16]. Furthermore, as shown in columns (5)-(8), the numbers are statistically significant at the 1 % level when determinants of a husband's income are estimated. On the other hand, they are not statistically significant when determinants of a wife's income are estimated. Further absolute values of estimations for husbands are about 6 times larger than those wives. This tells me that a decrease of a female's allocated heritance leads to a decrease of her husband's earnings. This leads me to conjecture that a female's childhood economic conditions capture the heritable wealth. I can deduce from the above that, for females, heritable wealth can be considered as an asset in the marriage market, while, for males, heritable wealth hardly influence economic outcomes in the marriage market.

What has been observed thus far is summarized as follows: after controlling for social circumstances and own and spouse's characteristics such as years of schooling and age, it was found that childhood economic conditions do not influence ones earnings for males and females. As well, a female's childhood conditions are positively associated with her husband's earnings, while a male's ones are not associated with his wife's earnings. Furthermore, the number of a female's siblings is negatively associated with her husband's earnings, indicating that allocated inherited wealth has an important influence on the choice of a mate. Hence, a female's childhood economic conditions result in economic benefits for her husband. Assuming that childhood economic conditions capture not only economic status but also non-monetary social status, a positive relationship between a wife's childhood economic conditions and her husband's earnings can be interpreted as follows: males with a great future or with high earnings are

[16] Results of other dependent variables in Table 4 are almost the same as those of Table 3. These results are available on request.

matched with females with socio-economic status. Another interpretation is that females raised under better economic conditions are more likely to possess traits valued in the marriage market. That is, her richer parents tend to invest not only money related human capital, but also training for homemaking since housework ability is regarded as a valuable asset in the marriage market.

6. Conclusion

Investigating differences of income between genders is a major economics issue. Adding to this issue is the one related to that gender differences in a partner's earnings can be considered as outcomes not only in the labor market, but also in the marriage market. The existing literature explores the effects of a wife's human capital on her husband's earnings. However, little is known about how one's socio-economic status influences a partner's earnings and how this effect differs between genders. Using individual level data, this paper attempted to examine how socio-economic status influences one's and one's spouse's earnings, and compared these results between males and females.

After controlling for own and spouse's characteristics such as human capital and age, I found: (1) Childhood economic conditions considered as socio-economic status are not associated with own income for both males and females. (2) The better a female's childhood economic conditions were, the higher her husband's income becomes. On the other hand, for males, childhood economic conditions are not related to a wife's income. (3) The number of a wife's siblings is negatively related to her husband's earnings, whereas the number of a husband's siblings is not associated with his wife's earnings.

These findings suggest that family's monetary and non-monetary status can be considered as an asset in the labor market for females but not for males. On the other

hand, the expected or realized amount of earnings is important for males but not for females when they are evaluated in the marriage market. Hence, a male's value in the marriage market depends on his own performance in the labor market, whereas a female's value in the marriage market is determined inherently. These differences between genders might be because of gender identity and labor market conditions. As a consequence, social stratification persists through marriage for females but not for males.

In this paper, childhood economic conditions are considered to capture not only economic but also social status. Nevertheless, this paper could not quantitatively distinguish economic from social status because of limitations of the data used. Hence, the discussion concerning the interpretation of the effects of childhood economic conditions remains open to debate. It seems necessary to quantify economic status and non-monetary social status separately, and then to analyze their effects on a spouse's earnings. It also remains unclear whether gender difference in the marriage market is the outcome of gender identity or of labor market conditions. These are issues remaining to be examined in future studies.

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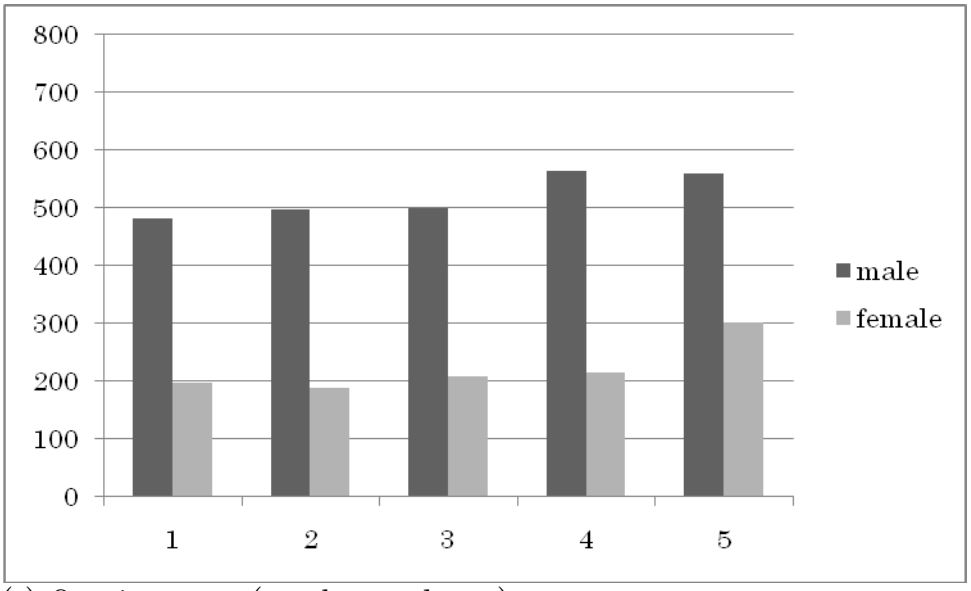
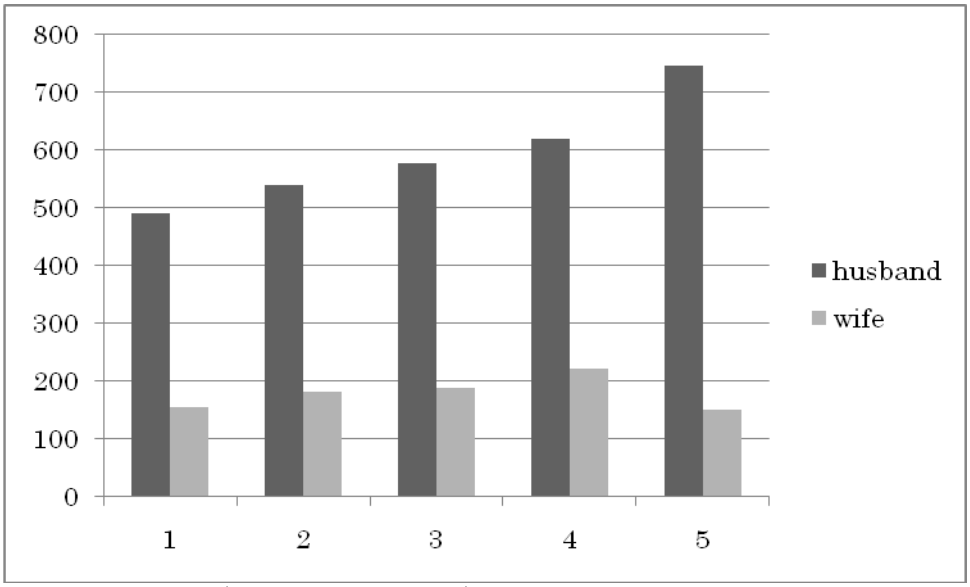


(a) Own income (ten thousands yen)



(b) Spouse's income (ten thousands yen)

Fig.1. Economic condition in childhood and the level of income
Note. Economic condition in childhood ranges from 1 (far below average) to 5 (far above average).

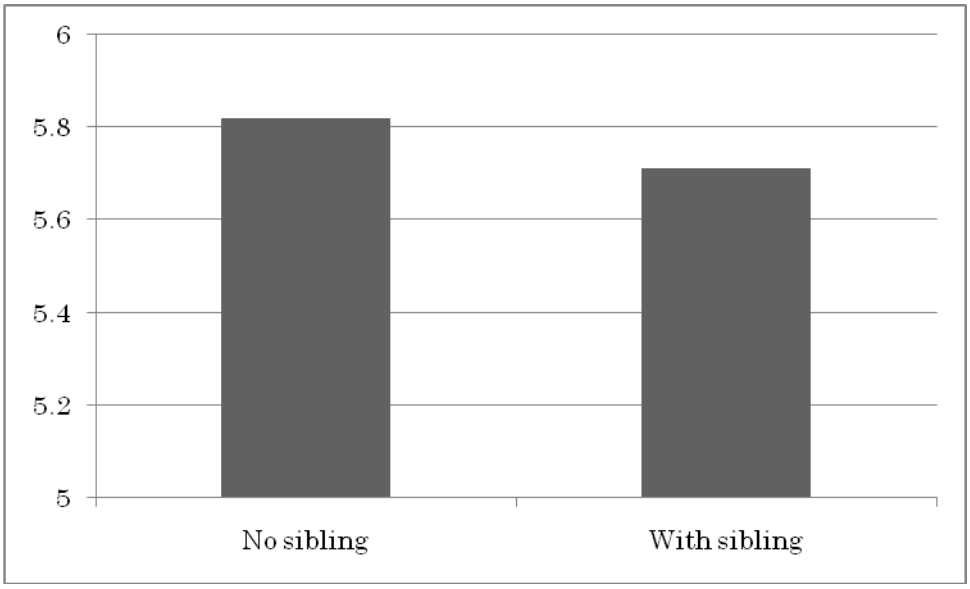


Fig.2. Wife's sibling relationship and husband's level of income (millions of yen)

Table 1. Definitions of variables, and mean values of male and female.

Variables	Male	Wife	Female	Husband
Income [a] (Millions of Yen).	5.06	1.83	2.02	5.66
Years of schooling	11.8	11.4	11.5	11.6
Father's years of schooling	10.8		11.1	
Mother's years of schooling	10.4		10.6	
Ages	51.7	52.1	52.1	54.7
Far below average(Yes=1): dummy (Economic condition at 15 years old)	0.09		0.07	
Below average (Yes=1): dummy (Economic condition at 15 years old)	0.25		0.22	
Average (Yes=1): dummy (Economic condition at 15 years old)	0.38		0.38	
Above average (Yes=1): dummy (Economic condition at 15 years old)	0.10		0.12	
Far above average (Yes=1): dummy (Economic condition at 15 years old)	0.01		0.02	
Number of siblings.	2.98		2.95	
Number of children who are younger than 6 years old.	0.13		0.13	
A husband's job is to earn money; a wife's job is to look after the home and family [b]	2.66		2.42	

Note.
a. In the questionnaire, the professional occupation is defined as a job that requires highly specialized knowledge, such as doctor, lawyer, researcher, engineer/technical expert, reporter, writer, artist, teacher, nurse, pharmacist, child caretaker, and social worker.
b. Values range from 1 (disagree) to 4 (agree).

Table 2. Dependent variable: Own income (Heckman selection-estimation).

Variables	(1) [c]	(2) [c]	(3)	(4)	(5)	(6)	(7)	(8)
	Male				Female			
Years of schooling	35.8**	36.3**	44.1**	44.6**	19.3**	20.2**	18.5**	19.2**
	(5.55)	(5.65)	(10.1)	(10.3)	(5.68)	(5.93)	(5.52)	(5.73)
Father's years of schooling	4.42	4.70	5.80*	5.98*	3.26	2.95	3.70*	3.38
	(0.99)	(1.06)	(2.23)	(2.30)	(1.46)	(1.36)	(1.66)	(1.55)
Mother's years of schooling	-4.48	-4.98	-5.46*	-5.73*	-2.97	-2.82	-3.27	-3.08
	(-0.99)	(-1.06)	(-2.03)	(-2.17)	(-1.21)	(-1.17)	(-1.34)	(-1.29)
Ages	12.5**	12.5**	4.14**	4.24**	2.44**	2.22**	2.42**	2.20**
	(7.15)	(7.24)	(6.77)	(7.00)	(5.11)	(4.76)	(5.13)	(4.80)
Far below average (Yes=1): dummy (Economic condition at 15 years old)	<Reference group >				<Reference group >			
Below average (Yes=1): dummy (Economic condition at 15 years old)	12.5	11.2	18.7	18.2	-25.9	-23.8	-21.9	-20.2
	(0.39)	(0.35)	(0.89)	(0.88)	(-1.54)	(-1.42)	(-1.34)	(-1.21)
Average (Yes=1): dummy (Economic condition at 15 years old)	29.3	28.7	20.8	20.8	-5.28	-1.58	-3.11	0.24
	(0.93)	(0.92)	(1.00)	(1.02)	(-0.33)	(-0.10)	(-0.19)	(0.01)
Above average (Yes=1): dummy (Economic condition at 15 years old)	71.3*	70.1*	64.2*	62.5*	-10.5	-8.86	-6.22	-4.82
	(1.79)	(1.78)	(2.26)	(2.22)	(-0.56)	(-0.46)	(-0.33)	(-0.26)
Far above average(Yes=1): dummy (Economic condition at 15 years old)	91.5	93.2	74.8	76.6	163.1*	164.4*	146.1*	147.4*
	(1.18)	(1.21)	(1.46)	(1.50)	(1.91)	(1.94)	(1.76)	(1.78)
Job category dummies [a]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies [a]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Residence location dummies, Prefecture dummies [a]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prefecture dummies at 15 years old [a]	Yes	Yes	No	No	Yes	Yes	No	No
	First Stage estimation							
Number of children who are younger than 6 years old.	-0.39**	-0.40**	-0.48**	-0.49**	-0.96**	-0.99**	-0.96**	-0.98**
	(-2.84)	(-2.88)	(-9.17)	(-9.44)	(-13.8)	(-17.0)	(-16.5)	(-17.1)
Opinion about the division of labor within a household [b]	-0.03		-0.02		-0.26**		-0.27**	
	(-0.81)		(-0.87)		(-13.0)		(-13.4)	

One's, parent's and spouse's years of schooling. One's and spouse's ages	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2727	2761	2754	2788	3657	3707	3694	3745
Uncensored observation	1919	1945	1930	1956	1593	1608	1604	1619
Log-pseudolikelihood	1051	1103	-14606	-14798	-12650	-12828	-12790	-12970

Note. Values in parentheses are z-statistics calculated by robust standard errors. * and ** denote significance at the 5% and 1% levels, respectively. In all estimations, a constant is included but not reported to save space.

a. In first stage of Heckman estimation, Job category, Size of residential area, and Year dummies used in the second stage are included, but not reported to save space.

b. Values range from 1 (agree) to 4 (disagree).

c. The coefficients fail to settle down because of the non-convergence in Columns (1) and (2). Hence a two-step estimation was conducted and, instead of pseudo-log-likelihood, wald-chi square is presented in Columns (1) and (2).

Table 3. Dependent variable: Wife's and husband's income (Heckman selection estimation).

Variables	(1) [c]	(2) [c]	(3)	(4)	(5)	(6)	(7)	(8)
	Wife				Husband			
Years of schooling	14.8**	14.0**	14.0**	13.2**	19.6**	20.0**	19.9**	19.8**
	(3.44)	(3.29)	(3.33)	(3.19)	(3.21)	(3.29)	(3.12)	(3.22)
Father's years of schooling.	-0.61	-0.37	-1.47	-1.31	5.56*	5.63*	5.19*	5.28*
	(-0.26)	(-0.16)	(-0.45)	(-0.41)	(1.80)	(1.83)	(1.73)	(1.76)
Mother's years of schooling	-0.19	-0.70	-0.08	-0.49	0.43	0.12	1.11	0.83
	(-0.08)	(-0.28)	(-0.03)	(-0.16)	(0.14)	(0.04)	(0.36)	(0.27)
Ages	2.92*	2.86*	1.68	1.62	-3.04	-2.69	-3.04	-2.73
	(1.76)	(1.73)	(0.85)	(0.82)	(-1.27)	(-1.13)	(-1.24)	(-1.12)
Spouse's years of schooling.	-0.92	-0.18	0.13	0.78	40.6**	40.5**	39.3**	39.3**
	(-0.19)	(-0.04)	(0.03)	(0.16)	(7.42)	(7.49)	(7.28)	(7.34)
Spouse's ages	-0.46	-0.51	-0.001	-0.04	8.96**	8.63**	9.02**	8.74**
	(-0.27)	(-0.30)	(-0.00)	(-0.02)	(3.96)	(3.86)	(3.86)	(3.78)
Far below average (Yes=1): dummy (Economic condition at 15 years old)	<Reference group >				<Reference group >			
Below average (Yes=1): dummy (Economic condition at 15 years old)	-0.31	1.30	4.73	6.05	41.9*	40.1*	41.0	41.1*
	(-0.22)	(0.07)	(0.28)	(0.37)	(1.76)	(1.68)	(1.63)	(1.65)
Average (Yes=1): dummy (Economic condition at 15 years old)	12.9	16.6	20.5	23.2	58.0**	58.0**	54.7**	56.7**
	(0.70)	(0.92)	(1.29)	(1.49)	(2.54)	(2.55)	(2.32)	(2.32)
Above average (Yes=1): dummy (Economic condition at 15 years old)	21.6	25.6	28.3	31.0	75.1**	74.9**	74.4**	76.4**
	(0.90)	(1.07)	(1.07)	(119)	(2.73)	(2.74)	(2.67)	(2.76)
Far above average(Yes=1): dummy (Economic condition at 15 years old)	-48.3	-48.8	-25.0	-24.5	120.2*	122.2*	150.5**	153.0**
	(-0.86)	(-0.87)	(-0.52)	(-0.51)	(2.06)	(2.15)	(2.45)	(2.56)
Job category dummies [a]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies [a]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Residence location dummies, Prefecture dummies [a]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prefecture dummies at 15 years old [a]	Yes	Yes	No	No	Yes	Yes	No	No

	First Stage estimation							
Number of children who are younger than 6 years old.	-0.82** (-11.4)	-0.83** (-11.6)	-0.83** (-12.1)	-0.84** (-12.0)	-0.74** (-9.92)	-0.73** (-9.91)	-0.71** (-10.2)	-0.70** (-10.1)
Opinion about the division of labor within a household [b].	-0.17** (-5.20)		-0.17** (-6.91)		0.05* (1.86)		0.05* (1.80)	
One's, parent's and spouse's years of schooling. One's and spouse's ages	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2519	2551	2538	2570	2460	2489	2480	2510
Uncensored observation	954	966	957	969	1711	1724	1719	1733
Log-pseudolikelihood	823	890	-7776	-7884	-12800	-12894	-12919	-13021

Note. Values in parentheses are z-statistics calculated by robust standard errors. * and ** denote significance at the 5% and 1% levels, respectively. In all estimations, a constant is included but not reported to save space.

a. In first stage of Heckman estimation, Job category, Size of residential area, and Year dummies used in the second stage are included, but not reported to save space.
b. Values range from 1 (agree) to 4 (disagree).
c. The coefficients fail to settle down because of the non-convergence in Columns (1) and (2). Hence two-step estimation was conducted and, instead of pseudo-log-likelihood, wald-chi square is presented in Columns (1) and (2).

Table 4. Dependent variable: Wife's and husband's income (Heckman selection estimation).

Variables	(1) [c]	(2) [c]	(3)	(4)	(5)	(6)	(7)	(8)
	Wife				Husband			
Number of siblings	-2.59	-3.24	-4.29	-4.72	-18.3**	-18.0**	-17.1**	-16.7**
	(-0.73)	(-0.92)	(-1.26)	(-1.39)	(-3.44)	(-3.40)	(-3.31)	(-3.25)
One's, parent's and spouse's years of schooling. One's and spouse's ages	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Economic condition dummies at 15, Job category dummies, Year dummies, Residence location dummies, Prefecture dummies [a]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prefecture dummies at 15 years old [a]	Yes	Yes	No	No	Yes	Yes	No	No
	First Stage estimation							
Number of children under 6 years old. One's, parent's and spouse's years of schooling. One's and spouse's ages	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Opinion about the division of labor within a household [b].	Yes	No	Yes	No	Yes	No	Yes	No
Observations	2519	2551	2538	2570	2460	2489	2480	2510
Uncensored observation	954	966	957	969	1711	1724	1719	1733
Log-pseudolikelihood	602	892	-7775	-7883	-12784	-12878	-12904	-13006

Note. Values in parentheses are z-statistics calculated by robust standard errors. * and ** denote significance at the 5% and 1% levels, respectively. In all estimations, a constant is included but not reported to save space.

a. In first stage of Heckman estimation, Job category, Size of residential area, and Year dummies used in the second stage are included, but not reported to save space.
b. Values range from 1 (agree) to 4 (disagree).
c. The coefficients fail to settle down because of the non-convergence in Columns (1) and (2). Hence two-step estimation was conducted and, instead of pseudo-log-likelihood, wald-chi square is presented in Columns (1) and (2).