MPRA

The Relationship Between the Effects of a Wife's Education on her Husband's Earnings and her Labor Participation: Japan in the period 2000 -2003

Yamamura, Eiji and Mano, Yukichi

2 May 2010

The Relationship Between the Effects of a Wife's Education on her Husband's Earnings and her Labor Participation: Japan in the period 2000 -2003.

Eiji Yamamura[*]

Department of Economics, Seinan Gakuin University, 6-2-92 Nishijin, Sawara-ku, Fukuoka 815-0075, Japan

Yukichi Mano

Foundation for Advanced Studies on International Development (FASID) and National Graduate Institute for Policy Studies (GRIPS), 7-22-1 Roppongi, Minato-ku, Tokyo 106-8677, Japan

Abstract

In this paper, we explore the relationship between the influence of wives' human capital on their husbands' earnings and their labor participation using individual level data for Japan in the period 2000–2003. We found that a wife's human capital has a positive effect on her husband's earnings regardless of her work status when the entire sample is used. Furthermore, we focused on couples with an age difference exceeding five years to remove the assortative mating effect. By using this subsample, the positive effect of a wife's education is observed when a wife is a non-worker, that is she does not work outside the home, but disappears in those who are workers, that is they work outside the home. This suggests that a wife's labor participation drastically reduces the positive effect of her human capital on her husband's earnings after controlling for the assortative mating effect. It follows from this that an educated housewife improves her husband's productivity, consequently increasing his earnings, whereas a working wife appears to not have enough time to do so. These findings are consistent with implications drawn from the situation in the United States (Jepsen 2005).

Running title: Wife's education husband's earnings.

---

[*] Correspondence should be addressed to the author at the Department of Economics, Seinan Gakuin University, 6-2-92 Nishijin, Sawara-ku, Fukuoka 814-8511, Fukuoka. Japan. E-mail address: yamaei@seinan-gu.ac.jp.

I. INTRODUCTION

It is widely recognized that human capital is accumulated through formal education and working experience (Becker 1964). Human capital is also highly influenced by interaction with people, and thus economic outcomes such as one's earnings are associated with family and community backgrounds (e.g., Behrman and Wolf 1984; Boulier and Rosenzweig 1984; Hauser and Sewell 1986; Corcoran et al., 1990, 1992).[1] Specifically, Benham (1974) was the first to argue that a wife's education improves her husband's human capital and so increases his earnings; the so-called "cross-productivity effect within marriage."[2] Using U.S. census data from 1960 to 2000, Jepsen (2005) finds that a wife's education is positively associated with her husband's earnings throughout the relationship, but the magnitude of the effect declines over time.[3] Jepsen conjectured that the rapid increase in a wife's labor participation reduced her time to improve her husband's productivity, but no direct evidence was provided. The degree to which a wife's labor participation influences her husband's earnings has also been examined, but not the direct effect of a wife's education on her husband's earnings (Loh 1996, Gray 1997). Little is known about how much a wife's labor participation influences the effect of her education on her husband's earnings.

This paper uses individual level data from Japan from 2000–2003 to examine whether a wife's labor participation influences the effect of her education on her husband. We found that the positive effect of a wife's human capital on her husband's productivity disappears in wives who work, although in general, a wife's education increases her husband's productivity.

II. MODEL

This paper uses Japanese General Social Survey (hereafter, JGSS) data[4]. JGSSs adopt a two-step stratified sampling method and were conducted throughout Japan

---

[1] As an example of social learning, Yamamura (2008) reports a case study from Japan in which people learned how to use computers from neighbors that already owned one.
[2] Their parents' schooling is also found to be positively associated with his earnings (e.g., Heckman and Holtz 1986; Lam and Shoeni, 1993, 1994).
[3] It is widely observed that a wife's human capital positively influences a husband's earnings; for instance, in Israel (Neuman and Ziderman 1992), Iran (Scully 1979), Philippine (Boulier and Rosenzweig 1984), Malaysia (Amin and Jepsen, L., 2005), and Brazil (Lam and Shoeni, 1993, 1994).
[4] Data for this secondary analysis, "Japanese General Social Surveys (JGSS), Ichiro Tanioka," were provided by the Social Science Japan Data Archive, Information Center for Social Science Research on Japan, Institute of Social Science, The University of Tokyo.

between 2000 and 2003. The surveys asked standard questions about an individual's and his/her family characteristics through face-to-face interviews. These data cover information related to marital and demographic (age and gender) status, annual income, years of schooling, age, size of residential area. Spouses' demographics (age and gender) status, job categories, and years of schooling were also obtained.

Table 1 presents definitions of the variables we use below and their mean values. All the observations in our sample (n=5,200) were of married couples. The sample was divided into two groups by the wife's labor participation status; working in one group and not working in the other group. There was no statistical difference in the mean values of any variables between the two groups. A husband's annual income (HINCOM) in the working-wife group (around 5.6 million yen) was almost the same as that of the non-working-wife group. On average, husbands were 50 years old and had 13 years of schooling. Wives were around 47 years old and had 12 years of education.

From Table 2, we can see that HEDU (husband's years of schooling) and WEDU (wife's years of schooling) are positively correlated with HINCOM. This is consistent with the conjecture that not only the husband's education but also the wife's increase his earnings. Correlation between HEDU and WEDU is 0.65; that between HAGE (husband's age) and WAGE (wife's age) is 0.95, suggesting that people tend to marry partners of a similar age and educational level. This is congruent to the assortative mating hypothesis with respect to education and age. That is, productive males marry well educated females, leading to a wife's education being positively associated with her husband's earnings.

In line with Benham1974 and Jepsen 2005, the estimated function takes the following form:

$$Ln(HINCOM)_i = \alpha_0 + \alpha_1 HEDU_i + \alpha_2 WEDU_i + \alpha_3 HAGE_i + \alpha_4 WAGE_i + u_i ,$$

where log of $HINCOM_{it}$ represents the dependent variable in individual i. α's represents regression parameters. u_i represents the error term. Years of work experience cannot be obtained and so a husband's age is incorporated to capture work experience. In addition, to control for market conditions and macro level shock, large city and medium size city dummies (size of residential area) and year dummies are included as independent variables.

The key variable is WEDU. If the wife's education has a positive influence on her husband's earnings, the coefficient of WEDU is expected to take a positive sign.

3

Assuming the assortative mating hypothesis is valid; a wife's education is positively related with her husband's earnings even if she makes no contribution to the improvement of his productivity. Therefore, before considering the relationship between the effect of a wife's education on her husband's productivity and her participation in the labor market, as argued by Benham (1974) and Jepsen (2005), it is necessary to distinguish the effects of WEDU between productivity and assortative mating explanations. A simple way to remove the assortative mating effect is to conduct the estimation using a sub-sample containing only husbands and wives who have an age difference of more than 5 years (Jepsen 2005). This is because "this sample represents couples who are less likely to have met each other either in high school or college" (Jepsen 2005, p.204). This sub-sample allows us to investigate how the wife's education affects her husband's productivity, after removing the assortative mating effect. Furthermore, we divided the sub-sample into husbands whose wives work and those whose wives do not work; thus enabling the association between a wife's labor participation and the effect of her education on her husband's productivity to be explored[5].

III. RESULTS

Table 3 presents the results of my estimations. Results in Columns (1)-(3) are based on the sample containing married couples not categorized by the age difference between husband and wife, whereas the results in columns (4)-(6) are of the sample that excludes couples with an age difference of less than 5 years. Results using the sample of non-working wives are in columns (2) and (5), while results using the sample of working wives are in columns (3) and (6). As shown in the first row, HEDU takes positive signs with 1 % statistically significance in all estimations, consistent with the well known human capital theory.

In Columns (1) to (3) the estimated coefficient on WEDU is positive and statistically significant; its magnitude indicates that an additional year of a wife's education increases her husband's annual income by 4 to 6%, slightly below the effect of a husband's education. When the assortative mating effect is controlled for (Columns 4 to 6), this positive effect of a wife's education on her husband's earnings still remains significant when the wife is not working (Column 5), whereas this effect disappears

---

[5] The decision process for a wife's labor participation should be considered to control for any selection bias. This is, however, beyond the scope of this note and is an issue to be addressed in future study.

when the wife is working (Column 6). This result suggests that an educated housewife provides support for her husband that improves his productivity; whereas a working wife does not have sufficient time to support her husband as much. In other words, there is a cross-productivity effect, but it works only when the wife devotes her time to support her husband.

Moreover, it is interesting to notice, comparing Columns (3) and (6), that a working wife's education increases her husband's earnings only when we include in the analysis couples with age differences of less than or equal to five years. As a working wife does not have sufficient time to improve her husband's human capital through their marriage, this result is highly indicative of the possibility that the assortative mating effect exists and that our estimation strategy successfully controls for this effect.

IV. CONCLUSION

As suggested by Jepsen (2005), using data from 1960 to 2000 in the U.S., a wife's education has a positive effect on her husband's earnings; however this effect decreased as time goes by. According to Jepsen (2005), this might in part be because of the dramatic increase in labor participation by married females. This paper directly examined how and the extent to which a wife's labor participation affects the influence of her education on her husband's earnings using individual level data from Japan. We found that a wife's human capital has a positive impact on her husband's earnings, for both working and non-working wives. Even after restricting the sample to married couples with an age difference greater than 5 years to control for the assortative mating effect, the positive effect of a wife's education continues to be observed. This effect, however, disappears in wives who work. These results imply that a wife's labor participation reduces the positive effect of her human capital on her husband's earnings. From this we derive the argument that a wife's allocation of time between the workplace and support for her the husband influences her husband's earnings.

REFERENCES

Amin S. and Jepsen, L. (2005). The impact of a wife's education on her husband's earnings in Malaysia. *Journal of Economics* 31, 1-18.

Benham L. (1974). Benefits of women's education within marriage. *Journal of Political Economy* 82(2), S57-S71.

Behrman J. and Wolfe B.L. (1984). The socioeconomic impact of schooling in a developing country. *Review of Economics and Statistics* 66, 296-303.

Boulier B.L. and Rosenzweig, M.R. (1984). Schooling, search, and spouse selection: Testing economic theories of marriage and household behavior. *Journal of Political Economy* 92 (4), 712-732.

Corcoran M., Gordon R., Laren D., and Solon G. (1990). Effects of family and community background on economic status. *American Economic Review* 89, 362-366.

Corcoran M., Gordon R., Laren D., and Solon G. (1992). The association between men's economic status and their family and community origins. *Journal of Human Resources* 27(4), 575-601.

Gray, J.S. (1997). The fall in men's return to marriage: Declining productivity effects or changing selection? *Journal of Human Resources* 32(3), 481-504.

Heckman J. and Hotz, V.J. (1986). An investigation of the labour market earnings of Panamanian males: Evaluating the sources of inequality. *Journal of Human Resources 23*, 462-487.

Hauser R.M. and Sewell W.H. (1986). Family effects in simple models of education,

occupational status, and earnings: Findings from the Wisconsin

and Kalamazoo studies. *Journal of Labour Economics* 4(3),

S83-S115.

Jepsen, L.K. (2005) The relationship between wife's education and husband's

earnings: Evidence from 1960-2000, *Review of Economics of the*

Household, 3, 197-214.

Lam D. and Shoeni, R.F. (1993). Effects of family background on earnings and

returns to schoolings: Evidence from Brazil. *Journal of Political*

Economy 101 (4), 710-740.

Lam D. and Shoeni, R.F. (1994). Family ties and labour markets in the United

States and Brazil. *Journal of Human Resources* 29, 1235-1258.

Loh, E.S. (1996). Productivity differences and the marriage wage premium for

white males. *Journal of Human Resources* 31(3), 566-589.

Neuman S. and Ziderman, A. (1992). Benefits of women's education within

marriage: results of Israel in dual labor market context.

Economic Development and Cultural Change 40, 413-426.

Scully, G.W. (1979) Mullahs, Muslims and marital sorting, *Journal of Political*

Economy, 87, 1139-1143.

Yamamura E. (2008). Diffusion of home computers and social networks: a study

using Japanese panel data. *Applied Economics Letters* 15(15),

1231-1235.

Table1. *Variable definitions and means.*

Variables	Definition	Non-working wife	Working wife	All
HINCOM	Husband's annual income (in ten thousand yen)	565	561	563
HEDU	Husband's years of schooling	12.9	12.7	12.8
WEDU	Wife's years of schooling	12.2	12.3	12.3
HAGE	Husband's age	49.5	49.6	49.5
WAGE	Wife's age	46.7	47.0	46.9
Obs.		2283	2659	5200

Notes: Values are simple averages of yearly values over the period 2000-2003. Total sample of "non-working wife" and "working wife" is 4942, which is smaller than "all" sample, 5200. Observations without data about a wife's work status lead to this difference.

Table2. *Correlation matrix.*

Variables	HINCOM	HEDU	WEDU	HAGE	WAGE
HINCOM	1				
HEDU	0.35	1			
WEDU	0.31	0.65	1		
HAGE	-0.05	-0.31	-0.39	1	
WAGE	-0.06	-0.31	-0.40	0.95	1

Table. 3. *Regression results on husband's annual income.*

Variables	All currently married.			Difference in age between husband and wife > 5years.		
	(1)	(2)	(3)	(4)	(5)	(6)
	All	Non-worker wife	Worker wife	All	Non-worker wife	Worker wife
HEDU	0.06***	0.08***	0.04***	0.07***	0.07***	0.07***
	(13.9)	(12.2)	(7.12)	(6.90)	(4.66)	(4.53)
WEDU	0.05***	0.06***	0.04***	0.05***	0.07***	0.02
	(8.57)	(6.70)	(5.38)	(3.01)	(3.31)	(1.11)
HAGE	-0.002	-0.002	-0.002	-0.008*	-0.01**	-0.005
	(-0.85)	(-0.64)	(-0.79)	(-1.70)	(-2.01)	(-0.85)
WAGE	-0.003	-0.003	-0.001	-0.005	0.002	-0.007
	(-1.15)	(-0.91)	(-0.36)	(-1.19)	(0.35)	(-1.16)
Constant	4.97***	4.68***	5.19***	5.34***	5.16***	5.56***
	(50.1)	(34.6)	(34.3)	(20.7)	(14.3)	(13.8)
Obs.	5200	2283	2659	901	389	473
Adj R²	0.16	0.24	0.10	0.21	0.28	0.14

Notes: The dependent variable is the logarithm of the husband's annual income.   Numbers in parentheses are *t*-statistics obtained by robust standard errors. *, **, and *** indicate statistical significance at 10, 5, and 1 per cent levels, respectively.   Although not reported here, large and medium-sized city, and year dummies are also controlled for.