The Effect of Labor Force Participation by Women on Family Income Inequality in Korea, Japan, and Taiwan*

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Abstract: This paper analyses the effect of labor force participation by women on family income inequality in Korea, Japan, and Taiwan. This paper explores two research issues. First, does labor force participation by women reinforce family income inequality due to homogamy or does it contribute to reduce family income inequality with the labor force participation of wives from low-income families? Second, is there a national variation of the effect of labor force participation by women on family income inequality across the three countries? The findings are: (1) the analysis of the SSM data displays that labor force participation by women reduces family income inequality in Korea and Japan, whereas it increases family income inequality in Taiwan, (2) the relative contribution of the wife's income to family income inequality is the largest in Taiwan and the smallest in Japan, (3) the largest reduction of family income inequality due to the wife's income is observed in Korea, whereas the lowest reduction is observed in Japan. The negative correlation between the income of a husband and the income of the wife in Korea contributes to the reduction of family income inequality.

Key words: Japan, Korea, Taiwan, labor force participation by women, family income inequality

Ⅰ. Introduction

1. Introduction

As the level of women's education achievement increases, more women begin to participate in the labor market in East Asian countries. Thus, the male bread-winner model of the family has been challenged by the rise of labor force participation by women in East Asian countries as well as in Western European countries. The rate of labor force participation by women increased from 44.6% to 52.5% in Korea, from 51.4% to 58.1% in Japan, and from 38.25% to 48.12% in Taiwan between 1980 and 2005 (OECD, 2007 and DGBAS, 2006: 44). A major source of the rise of prime aged labor force participation by women was the increase of married labor force participation by women, while young labor force participation by women decreased with the rise of in the enrollment of young women in higher education. While the rates of labor force participation by women in Korea, Japan, and Taiwan are still lower than European countries, they have continuously increased without interruption since the 1970s.

The wage differentials between men and women have been significantly reduced with the increased participation of women in the labor force. At the individual level, the ratio of the average income of women to the average income of men has steadily increased since 1980 in OECD countries (OECD, 2003). Although the median earnings of full time jobs for women is more than 20% lower than those of men in Korea and Japan (OECD, 2003: 15), gender wage gaps have also substantially shrunk in East Asian countries as well (Yoo, 2003; Kumamoto-Healey, 2005: 460).

How does the labor force participation by women affect family income inequality? Does it weaken family income inequality? Or does it reinforce family income inequality? These

are difficult questions because there is a complex institutional mediation between individual income and family income, which is less examined in the current social science research. The distribution of family income can be affected by the rate of female labor force participation, types of work done by women, the level of compensation, and family formation. These are strongly correlated with the nature of the labor market institution, collective bargaining system, family welfare, and marriage patterns; the interrelationship among these factors is not fully understood by social scientists.

Early studies in the US shows the leveling effect of labor force participation by women on family income distribution as women in low-income families participated in the labor market (Miller, 1966; Mincer, 1974; Lerher and Nerlove, 1984; Treas, 1983). Women's labor could provide complementary income source to the lower income family. Cross-national studies in Europe also show that the higher the labor force participation by women, then the lower family income inequality in Europe (Boca and Pasqua, 2003; Boca, 2003).

Recent studies present the reinforcing effect of labor force participation by women on family income inequality through the assortative marriage of similar educational and occupational backgrounds (Aslaksen, Wennemo and Aaberge, 2005; Deborinik and Blossfeld, 2001; Fernandez and Rogerson, 2001; Esping-Andersen, 2007). Middle class women tend to participate in the labor force more than working class women with the weakening sex segregation of occupation and an expansion of women in higher education, the difference in family income between working class dual income families and middle class dual income families increase. Furthermore, family income inequality increased with marriage based on similar educational background.

The debates on the effect of labor force participation by women on family income inequality commonly focus on the role of the family in income distribution. The studies argue that family

income dynamics are different from individual income dynamics in that family income dynamics is affected by family formation by marital sorting, the degree of labor force participation by women, wage inequality by gender, the types of work, and the level of compensation for women's work. Family dynamics plays a significant yet unacknowledged role in family income inequality.

This paper explores how labor force participation by women affects family income inequality in Korea, Japan, and Taiwan. Analyzing the Social Stratification and Mobility (SSM) survey data collected in Japan and Taiwan in 2005 and the Korea Labor and Income Panel Survey (KLIPS) in 2005, we examine the impact of labor force participation by women in family income distribution. Cross-sectional comparison will reveal different institutional arrangements with respect to family, work, and employment among the three countries.

2. Married Women, Work and Family Income Inequality

In sociology, research on inequality and stratification has focused on individual income, socio-economic achievement in the labor market, or the class position of an individual within the class structure. Individuals are considered as the prima facie base of social stratification and inequality. The individual is regarded as the unit of analysis in stratification research because the individual is an economic actor buying and selling labor power in a market where the compensation for labor is based on individual performance.

Inequality among individuals is no longer considered as social inequality in a contemporary industrial society. As the economic participation of married women increases, social inequality based on men's income or the income of husbands deviates from the family income. As Esping-Anderson (2007) argues, social stratification and inequality based on an assumption of the male breadwinner

model rapidly loses validity as more women join the labor force and the dual income family becomes a modal family type in contemporary industrial societies.

As married labor force participation by women increases, the family becomes a social institution that pools economic resource from family members to relocate it for consumption, savings, and investment. As a result, women in families with adequate economic resources are less likely to participate in economic activities. Women's labor supply is considered to be negatively correlated with family income (Leibowitz and Klerman, 1995). Social scientists believe that labor force participation by women has "a leveling effect" on economic inequality that enhances the income of poor families (Miller, 1966; Mincer, 1974; Lerher and Nerlove, 1984; Maxwell, 1990; Treas, 1983).

Other arguments and empirical research claim "a reinforcing effect" of labor force participation by women on family income inequality. Women are more likely to participate in economic activities as their education level increases and they are likely to marry men of the same or higher educational credentials. An increase of professional jobs contributes to widen the gap between dual income families of the middle class and those of the working class. The labor force participation by women is likely to reinforce inequality with the increase of educational homogamy and the increase of labor force participation by women from families with higher income (Aslaksen, Wnnemo and Aaberge, 2005; Cancian and Reed, 1999; Deborinik and Blossfeld, 2001; Fernandez and Rogerson, 2001; Esping-Andersen, 2007).

The debate on the effects of married women's labor supply on family income inequality is associated with the nature of a social institution that mediates between individual income inequality and family income inequality. There are four ways in which individuals are linked to family inequality.

First, patterns of family formation affect social inequality by

mating patterns. Some marriage formation such as strong educational and occupational homogamy enhances social inequality (Fernadez and Rogerson, 2001; Jaumotte, 2003; Mare, 1991; Pencavel, 2006). This results in (all things being equal) the more couples of the same social background, then the higher family income inequality.

Second, the labor force participation of women has been affected by the level of female education, working-time arrangements, the taxation system of the second earner's income, the form of family welfare such as childcare subsidies, child benefits and paid parental leaves, and gender-specific anti-discrimination policies (Jaumotte, 2003; OECD, 2004: 3-11; Yu, 2005). Women are more likely to participate in the economy or stick to the labor market as their education level increases (Hirao, 2001). However, the linkage between family and work is strongly mediated by social institutions, the social policy of the state, and the labor market situation. Family friendly policies of the state or firms allow women to participate in the economy under more beneficial terms.

Third, the choice of labor force participation by married women changes the distribution of family income by changing the distribution of family income (see Maxwell, 1990). The distribution of family income is depends on the characteristics of women who join the labor force. Married women (with husbands that have lower income) are more likely to join the labor market and tend to reduce family income inequality. Highly educated women (with husbands who have a higher income) that participate in the labor force tend to increase family income inequality.

Fourth, the type of job held by a married woman in the labor market affects family income. Managerial and professional jobs have the highest compensation level among jobs. Women with jobs in sex segregated occupations tend to earn lower incomes. Job type is also closely related with the level of compensation of

women's work. As the rate of part-time workers increases, the wage gap between male and female employees increases since the level of compensation of women's work is determined by occupation and job status. Salaries might be significantly lower than that of regular workers it women work as contingent or irregular workers (Kim, 2005; Shin, 2007). In addition to traditional irregular employees such as temporary employees or part-time employees, there are new types of contingent employees such as dispatched workers and contract employees. They received notably lower compensation for their work than regular workers. The job type that married women have in the economy directly affects the distribution of family income.

The dual income model of a family might be a modal pattern for the family even in East Asia. Based on an assumption of male bread winner model, we deal with wife's labor force participation and the level of a wife's income. While there is a large variation of labor force participation by women across each generation, significant social change takes place to include women's labor force participation in the labor market with the reduction of the labor force due to a lower fertility rate. An increased insecurity over the income from husbands due to earlier retirement and labor market flexibility in recent years pushes married women to the labor market to find extra income sources for unexpected life events. Consequently, labor force participation by women has become a social norm in East Asia as well.

3. Data and Measures

The data used in this study are from the 2005 *Social Stratification and Mobility* (SSM) survey conducted in Japan and Taiwan and the *Korea Labor Income Panel Survey* (KLIPS) conducted in Korea in 2005. The SSM survey has been conducted every 10 years since 1955. We used the SSM survey data in 2005

for the following analysis. The 2005 SSM survey (designed and coordinated by Japanese SSM Groups) was the first survey conducted with comparable questionnaires in Japan and Taiwan in 2005. The 2005 SSM survey was also the first SSM survey conducted in East Asian countries outside Japan. The sample population of the SSM survey were individuals aged 20 to 69. The KLIPS is a panel survey started from 1998 to comprehend the volatile labor market after the economic crisis in 1997. The KLIPS includes respondents older than 15 years. The data analysis is restricted to the dual income families aged 20 to 65 in Japan, Korea and Taiwan to investigate the impact of labor force participation by women on family income inequality.

The data contained 5,742 Japanese respondents, 6,251 Korean respondents, and 5,379 Taiwanese respondents. Japanese data includes respondents under age 65, whereas the Korean data and Taiwanese data include respondents older than 65. Respondents whose ages are under 65 in 2005 are analyzed in the following analysis.

The 2005 SSM survey data in Japan and Taiwan contain information about family income, husband's income, and wife's income. The 2005 KLIPS data has information about the wife's income measured in Korean Won. However, information about individual income in Japan and Taiwan is a grouped income measured by income intervals. To measure the income as a continuous variable, we choose the midpoint as presenting the central tendency of the group. However, it is impossible to calculate the midpoint of the highest income group with an open-ended interval. To calculate the midpoint of income of the open-ended interval of the highest income group, an extrapolation based on a Pareto distribution is made. A mathematical procedure for the extrapolation is provided by the following,

$$X^* = X\left(V/(V-1)\right), V = (c\text{--}d)/(b\text{--}a)$$

Where X is the lower limit of the open-ended interval, a the Logarithm of lower limits of interval preceding the open ended category, b the Logarithm of lower limit of open-ended interval, c the Logarithm of the sum of the frequencies in the open-ended interval and the one preceding it, and d the Logarithm of the frequencies in the open-ended interval (See Ligon, 1994: 6-7; Miller, 1966: 215-219).

Family income is affected by the husband's income and wife's income. Individual income may be affected by individual human capital recognized by labor economists such as Jocob Mincer (1973) and Gary Becker (1965) and occupation (Blau and Duncan, 1973) or location within class structure emphasized by sociologists such as E. O. Wright (1979) or Goldthorpe et al. (1980). For Mincerian human capital equation, year of schooling, and labor market experience are used as independent variables. Usually, the measure of labor market experience is calculated by the proxy measure of work experience since there is no information about work experience. Instead, this study uses age and age squared to capture an individual income profile.

To estimate the effects of occupation of income inequality, we use six categories of occupational classification based on the International Standard Classification of Occupation formulated in 1988. The six occupational categories are: managers and professionals, technician and semi-professionals, clerks and service, farmers and fishermen, skilled or semi-skilled workers, and unskilled workers.

To explore the effects of social class, we use four classes as independent variables; the capitalist class, the petite bourgeoisie, the middle class, and the working class. An empirical identification of social class is based on three dimensions, ownership of means of production, organizational authority, and credentials (Wright 1985 and 1997). The first dimension is ownership that divides the owning classes (the capitalist class and the petite bourgeoisie)

and non-owning classes (the middle class and the working class). The owning classes are divided into two different classes based on the number of employees. Those who hire more that 5 employees are classified as the capitalist class and those who hire less than 5 employees are the petite bourgeoisie.

The non-owning class is divided into the middle class and the working class. The middle class comprises the employees who have managerial or supervisory positions to control other employees and the employees who have professional/technical jobs of which the supply of jobholders is exclusively controlled by the state or professional organizations. The employees who have managerial jobs, or professional jobs or technical jobs in the ISCO occupational code are classified as the middle class. The remaining employees are the working class members. Thus, the working class is the residual social class in the sense that it does not have capital, authority, and skill or credentials (see Table 1 for details).

Table 1. Class Classification

Class	Self-employment	Number of Employees	Type of Occupation
Capitalists	Yes	More than 5	
Petty Bourgeoisie	Yes	0-4	
The Middle Class	No	No	Managerial/professional
The Working Class	No	No	Non-managerial/non-Professional

Table 2 presents the summary statistics of the data used in this analysis. We observe a similarity in the characteristics of individual human capital such as education and age across country. However, there is some difference in the occupational distribution and class composition. Japan and Korea show similar occupational distributions, whereas the occupation distribution of Taiwan differs from that of the two countries with a larger proportion of managers and professionals as well as a smaller proportion of clerks and

Table 2. Basic statistics of the Japanese and Taiwanese SSM 2005 and the Korea Labor Income Panel Survey (KLIPS) 2005

Variable	Japan		Korea		Taiwan	
	Husband	Wife	Husband	Wife	Husband	Wife
Age	47.40(10.96)	44.93(10.46)	46.34(9.53)	43.18(9.15)	45.46(10.05)	42.48(9.85)
ln Family Income	15.65(.67)		6.14(.61)		13.44(1.54)	
Log Income	15.19(1.46)	13.57(3.02)	5.13(.67)	5.12(.67)	12.57(5.92)	10.02(5.15)
Education	11.84(3.02)	11.93(2.81)	12.66(3.33)	11.52(3.26)	12.00(3.89)	11.18(4.15)
Occupation (%)						
Managers and Professionals	15.17	11.44	12.57	10.08	25.08	20.62
Technicians	16.65	9.68	15.36	11.23	14.04	18.64
Clerks and Service Work	24.91	50.95	25.13	48.67	17.49	30.37
Skilled and semi-skilled workers	32.49	13.33	34.02	15.53	27.47	10.86
Unskilled workers	5.79	13.03	8.10	9.02	8.28	12.70
Farmers	4.99	4.44	4.83	5.47	7.64	6.81
Class (%)						
Capitalists	8.16	3.64	3.61	.62	8.54	2.36
Petty Bourgeoisie	20.11	6.95	32.95	23.02	24.46	13.45
Middle Class	22.88	20.56	20.01	18.85	30.69	29.06
Working Class	48.85	68.85	43.42	57.52	36.31	55.13
N	1,590	1,590	3,469	3,469	2,173	2,173

Note: Numbers in parenthesis refer to standard deviation.

service occupations. This might reflect the nature of Taiwan as the "boss land", a land of small employers with small and medium size enterprises (Shieh, 1992). Taiwan also shows the largest proportion of the owning class, the capitalist class, and the petty bourgeoisie, among three countries. The proportion of the middle class is larger in Taiwan that the other two countries, reflecting the large part of technicians and semi-professionals in Taiwan.

The gender differences in occupation and class are remarkable across all three countries. Particularly, the sex-segregation of occupation is conspicuous in Japan and Korea. Women in Japan and Korea are concentrated in clerks and service occupations, whereas women in Taiwan are distributed across occupations. The sex-segregation reflects the different nature of the labor market as

well as the economic role of women in each country. Almost 40 percent of Taiwanese women worked in high income occupations such as managers, professionals, and technicians, only about 21% of Japanese women and Korean women had jobs in those occupations.

4. Regression-based Inequality Decomposition

An inequality decomposition (based on regression analysis) is applied in order to assess the impact of labor force participation by women on family income inequality (Fields, 2003; Israeli, 2007; Morduch and Sicular, 2002; Shorrocks, 1982). The total family income can be decomposed into several factors that contribute to family income inequality. The regression based inequality decomposition has an advantage over the commonly used inequality decomposition in that it can provide an understanding of the causal mechanism (Cowell, 2000; Fields, 2003; Yun, 2006). The following analysis applies an inequality decomposition proposed by Gary Fields (2003) to estimate the effects of labor force participation by women on family income. Fields' inequality decomposition allows the estimation of the relative contribution of the factors to the total inequality measured by the variance. The ith family income, Y_i, can be expressed as

$$(1) \qquad \ln Y_i = a_i' Z,$$

where $\qquad a = [a, \ b_1 \ b_2 \ ... \ b_j \ 1] \quad$ and $\quad Z = [1 \ x_1 \ x_2 \ ... \ x_j \ e].$

Here, the log-variance of income, a measure of inequality can be written as

$$(2) \qquad \mathrm{Cov}\left[\sum_{j=1}^{j+2} a_j Z_j, \ \ln Y\right] = \sum_{j=1}^{j+2} \mathrm{cov}\left[a_j Z_j, \ \ln Y\right]$$

Equation (2) can be rewritten as follows.

$$(3) \qquad \partial^2(\ln Y) = \sum_{j=1}^{j+2} \mathrm{cov}\left[a_j Z_j, \ \ln Y\right]$$

The log-variance of income can be decomposed into covariance between factors and the log income. When the last factor of Z is eliminated, the new log-variance of income can be

$$(5) \qquad \sum_{j=1}^{j+2} \mathrm{cov}\left[a_j Z_j, \ \ln Y\right]$$

The relative contribution of the last factor of Z can be R^2 of regression equation. The net contribution of each factor is given by

$$(6) \qquad s_j(\ln Y) = \mathrm{cov}\left[a_j Z_j, \ \ln Y\right]/\partial^2(\ln Y)$$

It is a relative factor inequality weighted by factor j (Fields 2003). The log-variance of income can be rewritten by

$$(7) \qquad \begin{aligned} s_j(\ln Y) &= \mathrm{cov}[a_j Z_j, \ \ln Y]/\partial^2(\ln Y) \\ &= a_j * \partial(Z_j) * cor[Z_j, \ \ln Y]/\partial(\ln Y) \end{aligned}$$

The contribution of the jth factor to the total log income inequality can be

$$(8) \qquad p_j(\ln Y) = s_j(\ln Y)/R^2(\ln Y)$$

5. Results

The overall income inequality in three countries is presented in Table 3. Variances of logged income of husband, wife, and family in the main diagonal in Table 3 indicate general levels of income inequality in each country. Income inequality measured by the variance of logged income reveals that family income inequality in Taiwan is 2.3406 (the highest among the three countries) whereas

Table 3. Covariance and Correlation Matrix among Income Types in Japan, Korea and Taiwan

	Husband's Income (HI)	Wife's income (WI)	Family Income (FI)
Japan (N=1,590)			
HI	2.2183		
	(1.000)		
WI	.0482	9.0911	
	(.011)	(1.000)	
FI	.5237	.5766	.4457
	(.5378)***	(0.2864)***	(1.000)
Korea (N=2,514)			
HI	1.1000		
	(1.000)		
WI	-.2097	5.2052	
	(-.0873)***	(1.000)	
FI	.6838	.5761	.6830
	(.7822)***	(.3165)***	(1.000)
Taiwan (N=1,304)			
HI	2.1259		
	(1.000)		
WI	.3815	9.5766	
	(.0832)**	(1.000)	
FI	.6194	1.1195	2.3406
	(.2825)***	(.2390)***	(1.000)

Note: 1) *** p-value<.001,   ** p-value<.01,   * p-value<.05
2) Numbers in parenthesis refer to standard deviation.

the family income inequality in Japan is the lowest at .4457. However, the wife's income inequality in Japan at 9.0911 is almost equal to that of Taiwan at 9.5766.

The difference in income inequality between the husband and wife is notable in the three countries. The wife's income inequality is larger in all three countries when compared to the level of the husband's income inequality. This implies that inequality within wives might be a source of family income inequality if there is a strong positive correlation between the husband's income and

wife's income. The wife's income might multiply the income inequality among husbands under specific conditions such as strong occupational homogamy. As seen in Table 3, Korea and Taiwan show different family dynamics in the income distribution. The positive correlation between the husband's income and wife's income in Taiwan intensifies income inequality. While family income inequality is smaller than the husband's income inequality in Korea, it is larger in Taiwan. This implies that labor force participation by women in Taiwan slightly increases family income inequality.

Table 4 presents a simple decomposition of family income inequality by income sources, husband's income, wife's income, and other unknown factors. There is a remarkable difference between Korea and Taiwan. First, the husband's income and wife's income in Korea explains a large part of family inequality. The residual is only .2348. Contrarily, those in Taiwan only explain less than 14% of the family income inequality in Taiwan. This shows that many unknown factors contribute to family income inequality in Taiwan. Focusing on the explained variance out of the total variance of family income, we also find that the impact of the wife's income on family income inequality is the largest in Taiwan. In Taiwan, 32.2 percent of the family income comes from the wife's income inequality, whereas it is 20.7 percent and 15.6 percent in Japan and Korea, respectively.

Labor force participation by women steadily increased in Japan, Korea, and Taiwan, however, its impact on family income inequality is different across those countries. If there is no labor force

Table 4. Fields' Decomposition of Family Income Inequality by Income Sources

Source	Japan		Korea		Taiwan	
Husband's Income	.3002	79.31%[a]	.6456	84.22%	.0915	67.78%
Wife's Income	.0783	20.69%	.1196	15.78%	.0435	32.22%
Residuals	.6215		.2348		.8650	
Total	1.0000	100.00%	1.000	100.00%	1.000	100.00%

Note: "a" refers to the relative contribution of one factor to the total variance explained.

participation by women, then family income inequality is the same as the husband's income inequality. While labor force participation by women in Japan and Korea contributes to lessen family income inequality, it elevates family income inequality in Taiwan. Figure 1 displays different patterns of labor force participation by women by husband's income groups in three countries. The wife's income share in Taiwan is the largest among the three countries. This shows that labor force participation by women is higher among high family income groups than low family income groups in Taiwan and increases the family income gap.

Which factors contribute to family income inequality in each country? To identify factors that significantly affect family income, we apply both individual human capital factors and social factors in the empirical analysis of income determination. The analysis of income determination is based on two assumptions. One is an assumption based on the theory of human capital that economists consider as a genuine finding of modern economics. Here education measured by years of schooling and age are introduced to estimate the effects of human capital on income. Another is an assumption based on stratification research that sociologists consider the core

Figure 1. Wife's income share by family income group
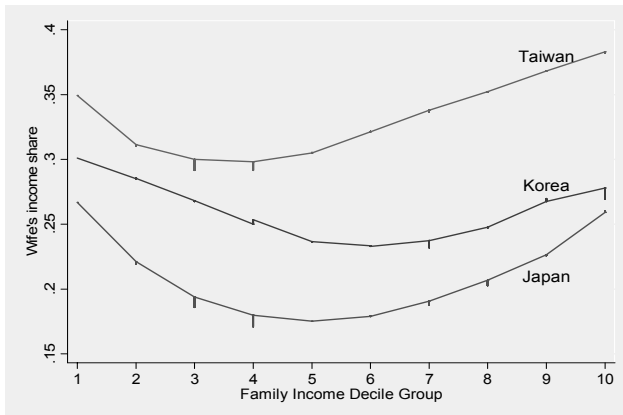
element of structural inequality. Sociologists consider social factors as well as individual human capital to explain income inequality. Thus, individual occupation and class location are introduced in the subsequent regression analysis of income determination.

Table 5 presents the result of OLS regression analysis of the income of husband, wife, and family. First, both husband's human capital and wife's human capital affect family income. However, the extent to which individual human capital affects family income is significantly different. Table 5-1 shows that the husband's education and age do not significantly affect family income in Japan. While age is a significant influence on the husband's income, it is not for the family income. On the contrary, the wife's human capital is not a significant factor to affect the wife's income but it is a significant factor for determining family income. Both the husband's occupation and class are significant determinants of family income, whereas only the wife's occupation is a significant determinant for family income.

Taiwan seems to be an opposite case to Japan in that husband's occupation and class are not significant factors in the determination of family income, whereas the husband's education is a significant one. Table 5-2 presents the OLS estimates of effects of human capital factors and structural factors on family income in Taiwan, displaying that women's occupation is a very important determinant of family income. The wife's occupation significantly contributes to family income. While the husband's occupation and class do not significantly change family income, the wife's occupation significantly affect the level of family income in Taiwan. Furthermore, the wife's education and age are significant factors that determine the family income in Taiwan. It is consistent with previous findings that wife's role is an important factor to understand the family income inequality in Taiwan.

Table 5-3 shows the result of the OLS estimation of the Korean case. The Korean case is a mixture of individual human capital and

Table 5-1. OLS Estimates of Determinants of Income: Japan

Variable	Husband's Income	Wife's Income	Family Income
Constant	12.1504	13.1658	14.5734
Husband			
Education	.0176 (.0141)		-.0015 (.0061)
Age	.1298 (.0261)***		.0263 (.0197)
Age^2	-.0013 (.0003)***		-.0003 (.0002)
Occupation			
Managers and Professionals	.6065 (.2287)**		.4096 (.0895)***
Technicians	.4265 (.2324)		.1749 (.0905)*
Clerks and Servers	.3221 (.1689)		.3526 (.0599)***
Farmers	.0251 (.2342)		.0532(.1113)
Skill/Semi-Skilled	.1039 (.1628)		.1407(.0566)*
Unskilled	-		-
Class			
Capitalists	-.0022 (.1619)		.2845 (.0779)***
Petty Bourgeoisie	-.2919 (.1174)*		-.0986 (.0509)*
Middle Class	.1299 (.1827)		-.1567 (.0750)*
Workers	-		-
Wife			
Education		.0199 (.0222)	.0175 (.0063)**
Age		.0166 (.0467)	.0444 (.0214)*
Age^2		-.0001 (.0005)	-.0045 (.0002)
Occupation			
Managers & Professionals		1.6158 (.4182)***	.2647 (.1024)***
Technicians		.9447 (.4155)*	.1792 (.1040)
Clerks and Servers		.6563 (.1881)***	.1405 (.0439)*
Farmers		.5174 (.2210)	.0516 (.1449)
Skill/Semi-Skilled		-.4327 (.6266)	.0692 (.0505)
Unskilled		-	-
Class			
Capitalists		.7418 (.3300)*	.0677 (.0505)
Petty Bourgeoisie		-.5437 (.2515)*	-.0148 (.0629)
Middle Class		.1156 (.3939)	.1314 (.0981)
Workers		-	-
Adjusted R^2	.0489	.0697	.3096
N	1379	1276	1103

Note: 1) *** p-value<.001, ** p-value<.01, * p-value<.05
   2) Numbers in parenthesis refer to standard deviation.

Table 5-2. OLS Estimates of Determinants of Income: Korea

Variable	Husband's Income	Wife's Income	Family Income
Constant	2.3110	3.6766	14.5734
Husband			
Education	.0413 (.0071)***		.0428 (.0071)***
Age	.1143 (.0106)***		.0054 (.0276)
Age^2	-.0013 (.0002)***		-.0001 (.0003)
Occupation			
Managers and Professionals	.4818 (.1110)***		.3077 (.0892)***
Technicians	.4256 (.1073)***		.2357 (.0836)**
Clerks and Servers	.3858 (.0442)***		.2932 (.0552)***
Farmers	.1236 (.1084)		.0609 (.0911)
Skill/Semi-Skilled	.3677 (.0714)***		.1946 (.0487)***
Unskilled	-		-
Class			
Capitalists	.4106 (.1078)***		.2677 (.1161)*
Petty Bourgeoisie	-.2640 (.0468)***		-.0938 (.0372)*
Middle Class	.1755 (.0895)**		.0743 (.0744)
Workers	-		-
Wife			
Education		.0505 (.0115)	.0258(.0078)***
Age		.0152 (.0308)	.0627(.0303)*
Age^2		-.0001 (.0004)	-.0005(.0004)
Occupation			
Managers & Professionals		.6408 (.1746)***	.1161 (.0919)
Technicians		.3847 (.1581)***	.0954 (.0828)
Clerks and Servers		.3803 (.0947)***	.1095 (.0492)*
Farmers		-.2722 (.4306)	.1634 (.2197)
Skill/Semi-Skilled		.2195 (.1043)*	.0015 (.0539)
Unskilled		-	-
Class			
Capitalists		1.4261(.3430)***	.3736 (.2237)
Petty Bourgeoisie		-.0662 (.0780)*	.0844 (.0414)*
Middle Class		.1009 (.1391)	.1109 (.0734)
Workers		-	-
Adjusted R^2	.1395	.1305	.4064
N	2561	907	888

Note: *** p-value<.001, ** p-value<.01, * p-value<.05

Table 5-3. OLS Estimates of Determinants of Income: Taiwan

Variable	Husband's Income	Wife's Income	Family Income
Constant	7.8789	6.5328	11.2541
Husband			
Education	.0595 (.0121)***		-.0431 (.0191)*
Age	.2116 (.0270)***		.0464 (.0646)
Age^2	-.0025 (.0003)***		-.0006 (.0007)
Occupation			
Managers and Professionals	.2967 (.1853)		.2568 (.2296)
Technicians	.0236 (.1722)		.1303 (.2118)
Clerks and Servers	-.1313 (.1488)		.1440 (.1802)
Farmers	-.6040 (.1969)**		-.2210 (.3118)
Skill/Semi-Skilled	.1117 (.1338)		.2083 (.1621)
Unskilled	-		-
Class			
Capitalists	.2000 (.1338)		-.2781 (.2016)
Petty Bourgeoisie	-.0916 (.1453)		-.1818 (.1297)
Middle Class	.2294 (.1364)		.0674 (.1735)
Workers	-		-
Wife			
Education		.1410 (.0286)***	.0376 (.0194)*
Age		.2042 (.0596)***	-.0148 (.0642)
Age^2		-.0026 (.0007)***	-.0003 (.0008)
Occupation			
Managers & Professionals		-.2703 (.4167)	.5435 (.2410)*
Technicians		-.0254 (.3244)	.6496 (.1843)***
Clerks and Servers		.6401 (.2728)*	.4064 (.1636)**
Farmers		-5.3459 (.4299)***	.4593 (.3305)
Skill/Semi-Skilled		.2339 (.3198)	.2911 (.1846)
Unskilled		-	-
Class			
Capitalists		.4747 (5336)	.4143 (.3184)
Petty Bourgeoisie		.7169 (.2439)**	.0617 (.1389)
Middle Class		.8433 (.2934)**	.0101 (.1685)
Workers		-	-
Adjusted R^2	.1857	.2555	.0900
N	1831	1452	1271

Note: *** p-value<.001, ** p-value<.01, * p-value<.05

social structural elements in determining family income. Both the husband's education and wife's education significantly increase family income. Occupation and class of both husband and wife significantly affect family income in Korea. However, the husband's factors more strongly affect family income than wife's factors.

Table 6 summarizes the relative contribution of each factor to family income inequality. While regression analysis tests the effect of individual factor on family income, the decomposition of family inequality by each factor examines the relative contribution of each factor to family income inequality. For the decomposition of family income inequality, we apply Fields' decomposition method to the final models of regression analysis in Table 5. Fields' decomposition base on regression shows the important factors in generating family income inequality. In Japan, the husband's age (.0113=.0281-.0168) and the wife's age (.0161=.0422-.0261) are more important factors than education (-.0011 for husband and .0154 for wife) in family income inequality. The husband's managerial or professional jobs and wife's managerial or professional jobs affect family income inequality. The middle class position of the husband and wife both increases family income inequality, widening the income gap between the middle class and the working class.

Individual factors (such as education and age) are the most important factors in Korea that contribute to family income inequality. In particular, the husband's education (.0484) and age (.0175) strongly increase family income inequality. The wife's education (.0300) also significantly boosts family income inequality. Structural factors such as occupation and class are not major sources of the family income inequality when compared to the effects of human capital on family income inequality. The wife's class has a limited effect on family income inequality.

Contrary to the above two cases, the Taiwanese case reveals that individual factors such as education and age determine the

Table 6. Decomposition of Family Income Inequality by Factors

Variables	Japan	Korea	Taiwan
Husband			
Education	-.0011	.0484	.0321
Age	-.0168	-.0025	-.0445
Age^2	.0281	.0211	.0614
Occupation			
Managers & Professionals	.0444	.0000	.0153
Technicians	.0069	-.0033	.0020
Clerk& Service	.0158	.0002	-.0013
Farmers	-.0160	.0136	.0061
Skilled/Semi-Skilled	-.0028	.0040	-.0052
Unskilled	-	-	-
Class			
Capitalists	.0248	.0063	-.0001
Petty Bourgeoisie	.00144	.0142	.0064
Middle Class	.0240	.0078	.0043
Working Class	-	-	-
Wife			
Education	.0154	.0300	.0295
Age	-.0261	-.1015	.0614
Age^2	.0422	.0949	-.0253
Occupation			
Managers & Professionals	.0249	.0000	.0246
Technicians	.0019	.0050	.0184
Clerk & Service	.0029	-.0050	-.0048
Farmers	-.0025	-.0183	-.0104
Skilled/Semi-Skilled	-.0022	.0000	-.0033
Unskilled	-	-	-
Class			
Capitalists	.0040	.0100	.0021
Petty Bourgeoisie	.0004	.0000	-.0009
Middle Class	.0259	.0000	.0006
Working Class	-	-	-
Residual	.7892	.8777	.8803

Note: Fields' method of regression based on the decomposition of inequality provides slightly different estimates when independent variables are categorical.

total family income inequality. The wife's age shows the largest impact on the family income inequality of .0361. The occupation and class of both husband and wife do not have a significant impact on family income inequality in Taiwan, except for the wife's managerial or professional occupation.

6. Conclusion

How does labor force participation by women affect family income inequality in Japan, Korea and Taiwan? While the rate of labor force participation by women in East Asia is still lower than European countries, it is steadily increasing with the increase of women with higher education. This study addresses this question by comparing family income inequality in Japan, Korea, and Taiwan. It requires comprehensive research to fully understand the dynamic process of family income inequality, including family formation, family's labor supply, wage determination, and childcare systems. However, this study only concentrates on an analysis of the impact of labor force participation by women on family income inequality in Japan, Korea, and Taiwan.

Four points are identified in this study. First, the effects of labor force participation by women on family income inequality are mediated by many institutional factors. While it reduces family income inequality in Japan and Korea, it increases family income inequality in Taiwan. The wife's income tends to widen the family income gap in Taiwan Because of the strong correlation between the husband's income and the wife's income. The Korean case shows an opposite case where the wife's income is negatively correlated to the husband's income. The wives of low-income families are more likely to join the labor force and tend to reduce family income inequality by lessening the husband's income inequality.

Second, the effects of the husband's income and wife's income on family income inequality significantly vary across three countries.

The husband's income and wife's income explain family income inequality in Korea, whereas they are extremely limited in explaining family income inequality in Taiwan. This implies that other factors not included in this study significantly affect family income inequality in Taiwan.

Third, the decomposition method based on regression shows the relative contribution of each factor or variable to family income inequality. In Korea, human capital factors (such as education and age) are major determinants of family income inequality, whereas human capital factors and structural factors are equally important in generating family income inequality in Japan. The wife's factors are more important than the husband's factors in family income inequality in Taiwan.

Finally, married women in Taiwan are more likely to take higher income jobs and tend to increase family income inequality when compared to Japan and Korea. The proportion of married women in managerial or professional jobs in Taiwan is significantly higher than Japan and Korea. Thus, the wife's share of family income is also higher than Japan and Korea.

This paper explores the linkage between the family and economy to investigate family income inequality. Research on individual inequality has significant limitations in understanding social inequality because family income inequality cannot be reduced to individual inequality. Complex social dynamics between the family and economy cannot be reduced to economic dimensions either. There is institutional mediation between family and the economy that affects the wife's participation in the labor force. Child caring facilities or the number of children influences the assessment of personal choices by married women. In addition to pulling factors such as the shortage of labor force due to rapid aging of population or pushing factors such as increased education levels for women. Family friendly employment policies of the state or firms directly affect the choices of married women.

This study focused on dual income families. However, it is necessary to include different types of families to address multifaceted social dimensions that connect married women and the labor market. The next step is to extend the analysis to different family types such as single income households that comprise almost 1/5 or 1/6 of the total households in East Asian countries or unmarried single households. Social inequality is a consequence of complex social dynamics and should be further explored to understand changing social inequality in East Asia.

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