

Determinants of Female Labor Force Participation in South Korea: Tracing out the U-shaped Curve by Economic Growth

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Abstract This paper attempts to investigate the structural relationship between economic growth and female labor force participation in Korea. The recurring issue of whether women's integration to the society is critical becomes salient once again, but with little consideration of its meaning and potential consequences. It extends further the research theme that the degree of female labor force participation relies on the extent to which social context is reflected in the time-series data for the country from 1980 to 2014. While multiple theories are being espoused in this research, effects traced across levels of analysis and over substantial temporality lead up to a system of dynamic causal relationships, using contingency table and log-linear analysis. It appears to be supported in the regression analysis that the country travels through the U-shaped curve over time whereas income inequality displays greater impact on women's employment. The empirical estimates of social transformation credit this trend to family structure and wife's education, as the second pivot that, at least, noneconomic causal factors are also operative.

Keywords Economic growth · Women's employment · Family structure · Educational attainment

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1 Introduction

The dynamic trend of female labor force participation in developing countries has drawn both academic and social attention. The degree of women's participation to the economy apparently signifies a desirable value for equity and sustainability issues. Female labor force participation can improve their quality of life as well as socioeconomic position in the real world (Kaushik and Kanbur 2009; Stiglitz et al. 2010). Then, to what extent are improvements in women's status associated with economic growth? Cross-national research reveals a curvilinear relationship between economic growth and female labor force participation, demonstrating the U-shaped hypothesis (Durand 1975; Pampel and Tanaka 1986). The documentation of the literature has attributed this relationship to changes in labor market, family structure, women's role, and educational factors (Horton 1996; Mammen and Paxson 2000).

The recurring issue of whether women's integration into the society is critical becomes salient once again, but with little consideration of its meaning and potential consequences. In addressing this theme, Korea can be regarded as a dazzling case which opens the debate about the linkage between theory and reality. With the compressed period of less than three decades, the country achieved such transformations as took 100 years to become true in other countries, overcoming the IMF financial crisis (Haggard 2000). As the Korean economy expands, more women participate in the labor market that shapes the trajectory of development.

The increasing number of women in the work force denotes dual-income families, in which both partners work either in full time or part time, now represent 42.9 % of families in Korea (Statistics Korea 2015). The weight of married women who are employed outside the home has exceeded that of employed unmarried women. This fact, however, does not reflect a complete picture. A more serious problem will appear if we move from the abstract to the concrete reality. Although most working women take jobs out of economic necessity, their contributions are not valued because men still play authoritarian roles in the family. In addition, the greatest cause of stress for employed women is society's expectation that they have full responsibility for the raising of children. Women experience psychological conflicts about their dual roles and also feel overload of burdens. The double reference continues in Korea while 20.1 % of women workers are forced to resign their jobs upon marriage (KWDI 2014).

In this vein, the purpose of the study is two-fold. First, an effort is made to explore an objective account of the structural relationship between economic growth and female labor force participation in the country, with the latter increasing at the early phases of the former but no more impacting on the later phases. Second, the study analyzes the nature of women's employment by family structure and educational attainment other than economic growth. Thus, it extends the research theme that the degree of female labor force participation relies on the extent to which social context is reflected in the time series data for the country from 1980 to 2014. The riddle which this paper explores is evident in the issue of underlying source of the pattern that provokes the great power shift in family structure and the women's status. While multiple theories are being espoused in this research, effects traced across levels of analysis and over substantial temporality lead up to a system of dynamic causal relationships, using contingency table and log-linear analysis. It clearly stimulates a growing momentum in policy debates as well as in common life discourses. The potential implications of the findings and theoretical reflections for the future study are suggested.

2 The Controversy: Limits to Convergence

Numerous researchers have described and analyzed the nature of development and its impact on female labor force participation (Cebula and Coombs 2008; Hakan et al. 2015; Huang 2003; Pascharopoulos and Tzannatos 1989). The most widely accepted conventional wisdom is that the process of industrialization causes a shift toward nuclear family from extended one. This perspective maintains that extended families decline in modern society, because they are not consonant with an industrial economy (Anderson 1990). A common set of economic growth is affecting every society in the direction of some family types with the different rates of speed. Conversely, development may exist without the small nuclear family and breakdown of the kinship network. There has been some evidence to the decline of the extended family in a variety of different contexts as the cases with Japan and Taiwan (Yu 2005). At least two general theoretical camps are persistent to explain the way in which levels of economic growth influence patterns of female labor force participation: (1) modernization theory and (2) world system theory.

Modernization theory unfolds a map that there is a positive relationship between female labor force participation and development, usually scaled by GDP per capita, increasing demand for labor and social acceptance of women's employment. It traces a path that seems to have been followed or quite closed by developed countries (Acemoglu and Robinson 2012; Amsden 2001). The general argument is that economic growth creates a need for female labor force participation through changes in the occupational structure, educational opportunity, and social consciousness on women's status, accompanied by low fertility rates and household structure (Diamond 2011; Eto 2008). These changes give rises to a greater demand and supply for women's role. From the mainstream viewpoint, increasing female labor force participation implies that women take advantage of a higher rate of development. It also reinforces the human capital that women with higher degrees of education are more likely to participate in the labor market. Thus, the modernization hypothesis can be drawn as follows: economic growth and women's education is positively related with female labor force participation.

By contrast, world system theory provides the different angle on increasing female labor force participation rates in developing countries. This paradigm considers economic growth as the catalyst for female labor force participation, but the mechanism reflects the higher level of marginality among lower class families rather than that of modernity at a national level. For the participation of international division of labor and the competition with core countries in the global market, peripheral countries should make use of labor productivity (Chomsky and McChesney 2011; Moghadam 1999). Once the economy improved to the stage where the peripheral position can be escaped, the actual process of compensation has lagged due to the unequal position between male and female labor force (Cohen 1993; Nam 1991). Empirical evidence is suggestive in that labor productivity has deteriorated while the consumer price is higher than other periods and spaces in Korea (Suh 2014). The comparative advantage in the world economy works on the same page even in later industrialization. Consequently, the world system hypothesis can be formulated as follows: economic growth is inversely related to the female labor force participation.

In spite of these controversial arguments and empirical research results, there is no doubt that economic growth influences the change of characteristics of family relationship between the elder and the younger and between male and female. Many of the major description of family and kinship changes are visible: the increase of free choice of mate

selection and decrease of parental control over courtship, relatively high emphasis on individual welfare as opposed to family continuity, and greater emphasis on the conjugal role relationship. With regard to the extended family, the forces of development dramatically reduce the control of the elderly.

However, these changes do not seem to be directly consistent with the persistence of extended family residence in some societies. Accepting the thesis that economic growth brings about changes in family life, the trend produces new family type such as neo-local residence. Although single household members accounts for about one quarter of the total population in contemporary Korea, extended residence fits nicely with certain elements of the society, offering tangible benefits for both young couple and their parents. It remains still a workable option despite these changes such as the increase of extra-familial employment, eroding parental control over courtship and extension of women's right and freedom.

More specifically, the incompatibility of the mother's role and wage worker as well as the costs of housing and children can be greatly reduced by the parents' providing the child care, housework, and monetary aid. With the traditional emphasis of intergenerational ties, these advantages make extended residence attractive to young Korean couples. It presents an appealing alternative to family segments of the contemporary society, rather than an anachronism.

The theoretical clue here is the relative merits of two opposing perspectives: the notion of modernization theory that the backbone of the participation of female labor is economic growth versus the claim of world system theory that female labor force participation cannot be reducible to the simple linear relationship. Despite their contrasting views, both the liberal and conservative approaches constitute the theoretical foundries that family structure and education as well as economic growth have a direct bearing on women's role (Becker 1985; Boserup 1990; Schultz 2002). A provoking inquiry is whether the pattern of female labor force participation follows the U-shaped curve—increasing, decreasing, or remaining unchanged. If it would not follow the given course, what is the other way to the difference? Here a thesis can be developed which underlines the form and degree of female labor force participation in Korea in shaping the trend. Accordingly, the ranges and logics between two orientations and their interconnections are the primary concern of the research.

3 Analytical Model and Strategy

The Korean family system is basically built on patrilineal descent with the ideal domestic grouping such as a large extended family. In an inheritance-oriented family structure, the continuity of a family line depends on the transmission of the family's common property, taking a form of a stock-share, with in-built mechanism of sharing. The traditional patriarchal system has a primary function of kinship roles that prescribe an individual's behavior in a wide range of options by the normative code. The solidarity or strength of the patriarchal system is powerful with mutual obligations imposed on family members. This conventional form, however, has been changed as the country develops economically. The most common types of households in current Korea are a nuclear family or stem family in which the members do not share the same residence but maintain close social contacts. These new units ordinarily represent different stages in the family life cycle, so that most people have experienced living in both types of families at different times in their lives.

Although modernization theory argues that all societies move fast or slowly toward the conjugal family system with industrialization (Cherlin 2012), more research on this point is needed.

The atomization of the family contains the changing relationship among family members and women's social status via labor force participation. In a traditional view, the wife's obedience to her husband's parents is more strict than to her husband (Kwon 1996). She cannot possess any implements of her own, and must not lend anything to others, even to her own father and mother without the permission of the husband's parents. However, this kind of patrilocal culture has been changed, since young married people have a tendency to seek for their own marriage life. Another set of account for the trend that the number of married couple living with wife's parents is gradually increasing flows from the change of demographic sex-ratio (Yoon 2015). It is the rise and spread of rationality ideology that precedes the move to greater equality with the levels of women's education and labor force participation which means a more bi-linear system.

This background requires a detailed and systematic design in the study of female labor force participation. It is assumed that different stages of economic growth will be differentiated enough to influence woman's employment. At the same time, the importance of generation and education in accounting for the great labor differentials needs to be included. The education variable, with conventional wisdom, is considered to tap the degree of social equality in the family system. Also, it calls for inclusion of family relationships to capture the specific mechanism that residential types have a significant impact on woman's status in labor markets.

The following are among the more important reserved models, which are guided by the theoretical clues:

Equation 1>

$$1-1> \text{ Female Labor Force Participation} = b_0 + b_1 \text{ Growth} + b_2 (\text{Growth})^2 + e$$

$$1-2> \text{ Female Labor Force Participation} = b_0 + b_1 \text{ Growth} + b_2 (\text{Growth})^2 + b_3 \text{ Gini} + e$$

Equation 2>

$$2-1> \text{ Female Labor Force Participation} = b_0 + b_1 \text{ Generation} + b_2 \text{ Education} + e$$

$$2-2> \text{ Female Labor Force Participation} = b_0 + b_1 \text{ Generation} + b_2 \text{ Education} + b_3 \text{ Gini} + e$$

For further analyses, the log-linear model is established by combining control variables to the above regression model:

Equation 3>

$$3-1> \text{ Wife's Employment} \times \text{ Family Structure and Wife's Education}$$

$$3-2> \text{ Times Saw Parents, Live with Son, Living Expenses} \times \text{ Family Structure}$$

$$3-3> \text{ Daughter's Education} \times \text{ Wife's Education}$$

Empirical evidence on woman's role and employment has shown the general relationship with economic growth at the global level. However, most previous studies cannot adequately trace the dynamic mechanism across levels of analysis. A single case study over time is needed to adjudicate the controversies concerning the complex thesis in developmental models (Collier and Brady 2004). The very dynamic transformation of semi-core status and unique social contexts allow one to apply a vertical structure to the case of Korea. It proceeds to see how historical evidence fits several cross-cutting themes. In this sense, a time-series investigation is designed to cope with important events in the actual

process by which various aspects of female labor force participation have unfolded. The data set from population and household to education and employment are taken from highly reliable sources of *Statistical Database*, including censuses and surveys, in Korean Statistical Information Service by Statistics Korea (2015), which are broad, large, and up-to-date.

The survey data provide significant information on social stratification, class, mobility, work, family and kinship, and attitudes toward social issues in Korea. The data to be analyzed in this study include family and kinship characteristics. For example, the variable of family structure refers to the complexity of the household in the sense of the number of generations, since the complexity of family structure increases when the units, the number of generations, are added to the household by the marriage of a son. In the sampling, the universe was defined as male Korean household heads between the ages of 15 and 64, living in Seoul, selected by systematic, multistage area sampling method. As the basic analytical strategy, the present research takes the viewpoint that a time span of 35 years—one generation—brings the test of heated controversies back about long-run processes of development. In order to estimate the parameters by which the effects of time and each variable can be disentangled, several regression models including ordinary least square are estimated. Also, the combined method of statistical technique that is applied to this research is a set of contingency analyses with cross-tabulation statistics as well as the log-linear analysis (Creswell 2008).

4 Findings and Discussions

The unstandardized regression coefficients for the equations of growth and inequality described above are spread out in Table 1. The models of the first equation tested in this study are derived from the Kuznets hypothesis whereby female labor force participation tends to improve in the early stage of development, with a reversal of the tendency in the later stage (Goldin 1995; Juhn and Ureta 2003). The second model is established to test the growth-share thesis by extending the first formulation of development. The analysis specifies the impact of economic growth and income distribution on woman's employments by employing 35 cases, arranged from 1980 to 2014 data set across each sector.

Bivariate analyses are least adequate for evaluating the growth-share thesis on female labor force participation. The U-shaped curve is best specified by a quadratic regression of women's employment on economic growth, measured by logarithmic transformation of

Table 1 Economic growth and female labor force participation

Independent variable	Female labor force participation	
	Model 1	Model 2
Constant	37.991(3.507)	42.904(4.080)
Ln(economic growth) ²	.156**(.064)	.145**(.062)
Ln(economic growth)	-.484(.972)	-.520 (.933)
Gini	–	–12.185** (5.711)
R _{adj} ²	.891	.899
D-W	.999	1.058
F	.000	.000
N	35	35

Standard error in parentheses

* $P < .10$; ** $P < 0.05$;

*** $P < 0.01$

GDP per capita to reduce the skewedness in the equation. The model explains about 90 % of the variance in the dependent variable, female labor force participation. As predicted, the result of Model 1 is in line with the hypothesized curve and the positive coefficient of economic growth is statistically significant. By contrast, Model 2 proves that the rate of female labor force participation reflects both a positive function of economic growth and a negative function of income inequality, measured by GINI index, with statistical significance of the .05 levels as a summary measure of development.

As turn up in Table 2, the parsimonious Model 3 reports that the extended family has a negative effect on women’s employment, and is consistent with the modernization perspective. It goes hand-in-hand with people who have a secondary education, as indicated by the negative sign with statistical significance. Model 4 reveals that female education, measured by the rate of woman’s advance to higher school levels does not impact on women’s employment, when other variables are controlled. The result also offers some evidence that the coefficient of income inequality ameliorates female labor force participation, at the high degree of statistical significance. More important, the effect of women’s employment is driven by the impact of income inequality when we take into account the variable of education and family sizes. This partially suggests that female education itself does not guarantee the certain solution for female labor force participation, that is, not a sufficient but necessary condition.

Extending the regression model, this study notes that female labor force participation is an extended function of structural characteristics of the family. The turning point to the shift at two points in time, 1980 and 2010, can be shaped in response to forces and conditions by the matrix of wife’s educational attainment and residential family type. The results of association among variables are drawn from the contingency table for each model. In the contingency analysis, two main measures of associations such as tau-c and Goodman and Kruskal tau are utilized to compare the robustness of the findings. When the dependent variable is an ordinal scale with at least three ordered categories, tau-c can be particularly useful in estimating the strength of association between the variables. The tau-c statistic varies from -1.0 to 1.0 value with any number of rows and columns, and the formula for tau-c is as follows:

$$\text{Tau C} = 2k(\text{CP} - \text{DP})/\text{N}^2(k - 1)$$

where C is the number of concordant pairs, D that of discordant pairs, k is the smaller of the number of rows and columns, and N is the sample size. The values of tau-c in Table 3

Table 2 Family structure and female labor force participation

Independent variable	Female labor force participation	
	Model 3	Model 4
Constant	73.258(5.520)	61.944(6.193)
Number of generation	-7.121***(1.253)	-2.636**(1.861)
Female education	-.078**(.033)	.025(.046)
Gini	-	-25.859*** (8.568)
R ² _{adj}	.832	.866
D-W	1.135	1.089
F	.000	.000
N	35	35

Standard error in parentheses

* *P* < .10; ** *P* < 0.05;

*** *P* < 0.01

Table 3 Wife's employment and family structure by year

Model	Statistics	Year	
		1980	2010
Model 5 Wife's employment by family structure	Likelihood ratio Chi square	16.952	.793
	Pearson Chi square	24.324	.789
	<i>P</i>	.0002	.673
	Tau-c	-.065**(.037)	-.005(.040)
	Goodman and Kruskal Tau	.052***(.027)	.002(.003)
Model 6 Wife's employment by wife's education	Likelihood ratio Chi square	9.922	96.166
	Pearson Chi square	11.604	86.325
	<i>P</i>	.019	.000
	Tau-c	.089***(.034)	.419***(.042)
	Goodman and Kruskal Tau	.025***(.018)	.167***(.030)
Model 7 Family structure by wife's education	Likelihood ratio Chi square	62.529	38.236
	Pearson Chi square	103.792	55.281
	<i>P</i>	.000	.000
	Tau-c	.038(.036)	-.015(.037)
	Goodman and Kruskal Tau	.063***(.017)	.018***(.007)

Standard error in parentheses

* $P < .10$; ** $P < 0.05$; *** $P < 0.01$

demonstrate that the relationships of family structure, wife's education, and wife's employment are very strong as noted earlier. The negative sign of tau-c in family structure in Model 5 means that the nuclear family expands as a function of industrialization while number of generation has been reduced in Korea. The tau's values are significant in 1980 and its sign is negative whereas those values are not significant in 2010. It suggests that the extended family has a negative impact on woman's employment but does not work in later stages.

As seen in tau-c's values in Model 6, the degree of wife's education and employment increases greatly. The values of tau-c and Goodman and Kruskal tau are statistically significant at the .01 level in a one-tailed test, and its sign is the expected direction (positive). Under the circumstances, the effect of wife's education on wife's employment is much stronger in 2010. This finding supports the modernization thesis that women's education will be positively associated with the degree of female labor force participation. In Model 7, the results are not significant at two points in time but only the Goodman and Kruskal tau shows the marginal effect of wife's education on family structure.

Table 4 clearly provides the linkage of family structure and relationship with statistical significance of the tau values among the causal models. In Model 8, a significant change across the year occurs in the variable of contact with parents by family structure. The tau value in 1980 has a positive sign while it indicates a negative sign in 2010, which are significant at the .10 and .01 level respectively. Model 9 tests the expectation of living with married-children by family structure in which the tau's values appear to be positive signs but only significant in 2010. This outcome is not at odds with the conservative argument

Table 4 Family structure and relationship by year

Model	Statistics	Year	
		1980	2010
Model 8 Times saw parents by family structure	Likelihood ratio Chi square	2.515	115.160
	Pearson Chi square	2.466	109.883
	<i>P</i>	.284	.000
	Tau-c	.111*(.076)	-.231***(.032)
	Goodman and Kruskal Tau	.021(.025)	.146***(.027)
Model 9 Live with son by family structure	Likelihood ratio Chi square	5.349	32.389
	Pearson Chi square	5.365	31.763
	<i>P</i>	.253	.000
	Tau-c	.044(.036)	.162***(.038)
	Goodman and Kruskal Tau	.005(.004)	.036***(.032)
Model 10 Living expenses by family structure	Likelihood ratio Chi square	21.765	15.209
	Pearson Chi square	21.125	16.115
	<i>P</i>	.005	.055
	Tau-c	.118***(.035)	.025(.036)
	Goodman and Kruskal Tau	.015***(.006)	.008**(.004)
Model 11 Daughter's education by wife's education	Likelihood ratio Chi square	78.635	30.415
	Pearson Chi square	66.043	27.968
	<i>P</i>	.000	.000
	Tau-c	.179***(.034)	.116***(.023)
	Goodman and Kruskal Tau	.091***(.016)	.049***(.018)

Standard error in parentheses

* $P < .10$; ** $P < 0.05$; *** $P < 0.01$

that the extended family increases the expectation of living with married-children (positive).

In Model 10, the tau values for living expenses by family structure prove the hypothesized positive sign and significant in 1980. The outcome in 2010, however, is not the case that family structure increases the expectation of defraying living expenses of parents after 30 years in Korea. When Model 11 considers the association of daughter's education and wife's education, the tau's values have positive signs and are statistically significant at the .01 level over time. It appears to be correct, then, that women's education has a positive impact on the desired level of education for daughter.

To ascertain whether the results for main issues of female labor force participation are robust with respect to each model, a set of log-linear analysis is presented, since the essence of log-linear is the iteration as a function of the marginal. In the log-linear model, the criterion to be estimated is the expected cell frequencies by the equation of all the variables in a model. So the log-linear is a way of data analysis on the relationship between variables, using a multi-way contingency table as an input. Under the log-linear model with a large L , the model does not fit the data well and should be rejected as an inadequate representation of the relationships among variables (Knoke and Burke 1980). The expected frequencies can be formulated as follows:

$$E_{ij} = (O_i \times O_j)/N = (O_i/N \times O_j/N)/N = (P_i \times P_j)/N$$

$$\text{Log } E_{ij} = \log O_i + \log O_j - \text{Log } N$$

Summing up the observed and expected values of the variable in Tables 5 and 6, the index score of family structure varies from 1 to 3, with higher scores representing more traditional family norms concerning obligations to parents. The education variable is classified by schooling years within the standard three-category code: (1) low: 6 years or less; (2) medium: 7–12 years; (3) high: 13 or more years. As specified in Table 5, the variables for wife's employment, generation, education, are not statistically independent. The expected frequencies, for example, are completely determined by the marginal distribution of family structure and wife education. The goodness-of-fit of the model is very high with Pearson Chi square of 16.082 and likelihood ratio Chi square of 8.092 in 1980.

Table 5 Residual analysis for wife's employment in 1980

Variable	Code	Observed	Expected	Residual	Residual _{std}	Residual _{adj}
Wife's employment	No					
Generation	1					
Education	Low	3	1.6	1.37	1.07	1.52
	Medium	1	1.0	-.07	-.06	-.08
	High	1	.1	.92	3.35	3.43
Generation	2					
Education	Low	180	180.6	-.61	-.04	-.34
	Medium	64	61.1	2.89	.37	1.67
	High	2	2	-.05	-.03	-.06
Generation	3					
Education	Low	110	108.5	1.46	.14	.84
	Medium	24	24.6	-.59	-.12	-.36
	High	3	1.6	1.35	1.05	1.58
Wife's employment	Yes					
Generation	1					
Education	Low	3	4.3	-1.37	-.65	-1.52
	Medium	5	4.9	.07	.03	.08
	High	1	1.9	-.92	-.66	-3.43
Generation	2					
Education	Low	28	27.3	.61	.11	.34
	Medium	13	15.9	-2.89	-.72	-1.67
	High	3	2.9	.05	.03	.06
Generation	3					
Education	Low	15	16.4	-1.46	-.36	-.84
	Medium	7	6.4	-.59	.23	.36
	High	1	2.3	-1.35	-.88	-1.58

Likelihood ratio Chi square = 8.092; Pearson Chi square = 16.082; $P = .007$

Accordingly, it can be interpreted that family structure and wife's education have an impact on wife employment in 1980.

In Table 6, the frequencies confirm that the residuals of the three generations family with a low educational level are very large, compared to other residuals. Such a high residual allows us to estimate that the family with three generations has a complex mix of educational levels, since it includes the first generation with less education. The outcome denotes the parameter estimates for the model of wife's employment. Therefore, this factor modifies the results for 2010 when a type of extended family has been changed through the reduction of the number of generation.

Table 7 focuses on the relationship of family structure, wife's education and employment. In 1980, the coefficient for the number of generation is statistically significant at the .01 level in a one-tailed test, and its sign is contrary with the expected direction. It supports the positive effect of the extended family on wife's employment, net of the effect of wife's education. This result is not in line with the hypothesis that the nuclear family has a positive impact on the degree of woman's labor force participation. Therefore, there is reason to suspect modernization theory, yet a threshold is reached in later phases of the

Table 6 Residual analysis for wife's employment in 2010

Variable	Code	Observed	Expected	Residual	Residual _{std}	Residual _{adj}
Wife's employment	No					
Generation	1					
Education	Low	10	10.2	-.23	-.07	-.17
	Medium	8	5.9	2.01	.82	1.54
	High	2	3.0	-1.00	-.57	-.71
Generation	2					
Education	Low	77	80.3	-3.38	-.37	-1.48
	Medium	94	93.3	.67	.07	.28
	High	20	16.5	3.48	.85	1.74
Generation	3					
Education	Low	38	33.6	4.39	.75	1.95
	Medium	17	18.9	-1.91	-.43	-.88
	High	3	4.7	-1.70	-.78	-1.01
Wife's employment	Yes					
Generation	1					
Education	Low	3	2.7	.23	.13	.17
	Medium	1	3.2	-2.01	-1.16	-1.54
	High	10	9.0	1.00	.33	.71
Generation	2					
Education	Low	37	33.6	3.38	.58	1.48
	Medium	72	72.6	-.67	-.07	-.28
	High	73	76.4	-3.48	-.39	-1.74
Generation	3					
Education	Low	10	14.4	-4.39	-1.15	-1.95
	Medium	17	15.0	1.91	.49	.88
	High	24	22.3	1.70	.36	1.01

Likelihood ratio Chi square = 7.606; Pearson Chi square = 6.984; $P = .222$

Table 7 Log-linear parameter estimates for the model by year

Independent variable	Wife's employment	
	1980	2010
Number of generation	.478***(.104)	-.068(.058)
Wife's education	.194*(1.22)	.196***(.066)

Standard error in parentheses

* $P < .10$; ** $P < 0.05$; *** $P < 0.01$

process, when the effects of family structure become more differentiated. Although presumably correct, this observation calls for deliberated consideration on the developmental stage.

By contrast, the coefficient for the same variable is not significant in 2010 as the case with the result of contingency analysis. This finding comes as no surprise to world system theory which emphasizes gender inequality on the basis of combined effect of patriarchy and capitalism. Capitalism utilized traditional patriarchal relations and systems of male domination, to speed its capital accumulation up. Since women's oppression comes from the household, the primary locus of patriarchal relations that assign women staunchly to reproductive roles. The patriarchal division of labor benefits capitalism, for women's unpaid domestic labor and child rearing reproduce the labor force at minimal cost. As Korean women have fewer children recently, their dual roles continue to condition the terms of female labor force participation. This ambivalence about women's role as wage earners creates a surplus labor reserve, to prevent them from the work force according to the system's labor needs. Also, the change of family structure denotes the normal fertility decline during economic growth and social development.

As predicted, the coefficient for wife's education has a positive sign and it is significant at the .10 level in 1980 and .01 in 2010 in a one-tailed test. This result is consistent with the proposed hypothesis of a positive effect of wife's education on wife's employment, when family structure is held constant. In short, the log-linear analysis partly support the results of contingency analysis reported earlier in the model while they also require a further investigation on the underlying relationship between family structure and female labor force participation. In other words, there is a differential demand of household type, implying a more combined effect of gender role and development.

5 Conclusion and Implications

The overall findings in the present research supports two theoretical orientations, and underlines the specific mechanism within which female labor force participation emerges and plays out, including economic growth, family structure and educational attainment. The results of the regression analysis affirm the existence of a U-shaped curve between economic growth and female labor force participation in Korea, and estimations of the log-linear analysis lay family structure and wife's education on this curve. The downward portion of the curve can be ascribed to the gender structure of labor market during shifts to urbanization while the upward portion occurs when women return to the market at developed stages to fill the service sector. In a way, wife's education and employment are directly consistent with the argument of modernization theory that development is

associated with a shift from extended to nuclear family, the increase of wife's education and employment. Meanwhile, wife's employment can be explained by family structure in 1980 but no longer in 2010 and more importantly, the latter cannot be accounted for by wife's education. These facts ultimately uphold that there is the complexity of Korean family system, indicating a transitional pattern. In point, it is not just a type of nuclear or extended family but more complex mixed family structure.

With regard to female education, it does appear to be a crucial effect on wife's employment as well as daughter's educational level. Taken together these results, there is strong evidence that, despite the residential type other than the nuclear family has a positive influence on the married women's employment through the aid from the grandparents. The rapid socioeconomic developments, increasing levels of educational attainment among women and growing employment opportunities, expand the chances of female labor force participation. It reflects indirectly the socioeconomic status of the family where women belong, which displays with world system theory. It is still implicitly shown by parents' attitude toward their daughter's education, with the tendency of preferring a son to a daughter. It is worth noting here that women's position can be paradoxically tapped to ameliorate wife's education as the equilibrium when economic growth produces social diversification and occupational differentiation.

Beyond the continued approach to the use of a single yardstick such as economic growth, the Korean case, with the high and consistently moving tides of development, explicates and extends the main theme of family relationships. The complexity of the family as a function of development is melted into contrasting results. The present research illuminates the influence of the extended family in terms of life cycle while education is a dominant factor of female labor force participation across years. The U-shaped relationship suggests that modernization accounts for both the early and later phase of development whereas world system gives a reason for the middle stage of the course due to the marginality of family status and gender inequality.

The interesting result of the relationship with parents and living expenses by family structure suggests a conceptual distinction between actual and ideal notion of the family. It challenges both old myth of the shift from extended to nuclear family and new myth of the constant existence of a nuclear family. In fact, the Korean society tends to have a large number of nuclear families but the role of the family is still oriented toward the extended family system. Although people are less likely to live with their parents, they nonetheless have more contact with parents, since their parents are more likely to be alive. It is acceptable in the country that the kinship system makes it so important in the pattern of expectations that imposes on people's behavior through the basic ways of reckoning descent such as patrilineal or bi-lineal kinship system. On the other side of the coin, the expectation of living with the married-children is feasible to support the positive function of the extended family. The importance of certain structural family conditions is clear in the process of development from both parents' and children's viewpoint.

The only caveat is the association of wife's education and family structure, which does not back up the hypothesized positive effect of the nuclear family. One possibility deserves attention: if the women's educational attainment indicates the family socioeconomic status, the cultural factor emphasizing intergenerational ties remains still powerful. Furthermore, we can assume that educational opportunities provide women with the higher chances to change her values or attitudes toward the extended residence. Despite the significant decrease of extended residences, the result demonstrates a modified function of the family system fitting to contemporary Korean society.

The log-linear analysis estimates historical change in the role of the family via development and the significant effect of education on female labor force participation, controlling the effect of family structure. Compared to the results of cross-tabulation analysis, the contrasting positive effect of the extended family on wife's employment, when the *ceteris paribus* conditions are held, requires a more elaborated analysis. One of the major sources, for instance, to illuminate married women's employment can be the economic situation of her family, regardless of family structure. Economic needs for the survival of low class family urge the married women into work place. Another source is their improved ability to participate in the labor force through education and toward their satisfaction through work, representing the socioeconomic status of their family. What is more, a married woman living with her own parents is more likely to participate in labor force than those living with her parents-in-law, being others equal. In the real world, the wife receives more help such as child care and housework aid from her parents than from her husband's parents and is more likely to show more satisfaction with respect to proximity to parents.

Returning to the key issue in these findings, the first approximation is that the trend of female labor force participation is reducible to a vulgar economic determinism. However, several points in this study have gone beyond the first sketch that economic growth is the engine driving social change. The social transformation in Korea lends further support to the next line that, at least, noneconomic factors are also operative. There are some complementary possibilities such as the dimensions of time-causality and socioeconomic relationships—that is each variable may be both a cause and an effect of the other. On the one hand, historical residues in the country elucidate a patterned curve between economic growth and female labor force participation. On the other hand, it warns the insufficient understanding of how the mechanism works turns out a misleading landscape, and places a greater emphasis on the context of in longitudinal evidence. By the same token, future research needs to promote other theoretical possibilities as well as methodological tools toward its comparability across the region.

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