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Changes in Labor Force Participation of Married Women in Korea: 1980-2005*

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This paper investigated labor force participation pattern changes of married women from 1980 to 2005. Using the micro samples of Population and Housing Census provided by the Korean National Statistical Office, the following results were obtained.

The labor force participation rate of married women has substantially increased from 1980 to 2005, with some significant changes in labor supply pattern worthy of note. The most important finding concerns the highly educated women's and younger cohorts' labor supply patterns. Labor force participation rate rapidly increased among college educated married women and wives of college educated men. This is different from the stylized fact associated with married women's labor in Korea, that is, "More educated, less work." This change is more obvious among recent cohorts born from 1971-1975 and from 1976-1980. In contrast to the spouses who trigger less of an influence on married women's labor, the presence of children still proved to be a critical component.

—Key Words: Married Women, Census, Labor

I . Introduction

Rapid population aging has recently been considered as one of Korea's most important

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population problems. This is mainly due to the aging population's direct association to labor difficulties, that is the permanent trend of on-going aging is related to a shrinking labor force. The future will possibly have labor force shortage as one of the most important economical and social problems the country will have to face if the recent population transition in Korea is any indication. A shrinking labor force, after all, diminishes labor productivity and further damages economic growth. It is therefore, important to encourage non-participating people to work in the labor market.

In Korea, participation in the women's labor force has steadily increased from 37% in 1963 to 50.3% in 2006, while that of men has seen a moderate fall. In particular, the increase in the participation of married women to the labor force, has led to an overall increase in the participation of women in general. This change is not entirely different from what other developed countries have experience in the past (Goldin 1990; Costa 2000; Chang 2001). Even with the steady increase during the last 40 years, labor force participation by women and, specifically married women, still continues to be low in Korea as compared to that of other advanced countries: this is only considered average even in OECD countries.¹⁾

Such is the subject's importance that studies abound regarding married women's labor in Korea. Among them is by Uh (1991) who investigated change in the female labor supply pattern as well as pointed out the status in labor market, which focused on women born in 1950's and 1960's. Hwang (2002) suggested that labor supply of married women should be investigated not only in terms of family characteristics but in terms of married women's individual characteristics as well. Focus was also given to the role of married women in the family (family role) along with an investigation as to how this affects married women based on the KLIPS (Korean Labor Income Panel Study). This paper went on to report that younger and highly educated married women are less affected by family characteristics, whereas older and less educated married women are otherwise. Also noteworthy is a study by Hwang and Choi (1998), who used semi-parametric estimation to investigate factors which affect married women's labor supply: the study found that the

1) According to the OECD's Report in 2006, the average labor force participation rate of women is 60.4%.

most critical factor in married women's labor supply decision is the presence of children under eight years old in the family.

Most of Korea's recent studies on married women's labor are usually based on the KLIPS data which provide useful suggestions for married women's labor. However, it is difficult to determine whether the results can be viewed as part of a long-term trend because the data only cover the years following 1997. The employment of the Population Census 2% Micro Sample provided by the Korean National Statistical Office, however may have overcome some of the limits. Of note, this is the first attempt ever made in using the Population Census data with regard to the analysis of married women's labor. This Population Census data indeed has some advantages. First, this study was able to increase the sample size included in the analysis, making various sub-groups such as educational level, cohort and residential areas possible. Moreover, census data made it possible to include long-term analysis, with the study covering 25 years' of changes in behavior of married women's labor. This long-term time span is also a first in the analysis of married women's labor in Korea.

With this in mind, this study found some key features in Korea's labor supply of married women. First, married women's individual education and their spouses' play a significant role in the overall changes in married women's labor pattern. Second, rapid aging results in more labor market participation for older, married women, especially those in the rural areas. The most striking finding is that, over past 3 decades, there has been a possibility of steady and dramatic reduction in income effect coming from spouses' income, which affects the non-labor income. The social norm regarding gender roles in Korea is that women are likely to work inside the home, and men outside. The findings in this study, however, show a breakdown of the traditional division of labor; this is most significant among younger cohorts and highly educated groups, that is, college graduates. This result could support various articles which argue that the pool of married women workers are separated by highly educated younger women and less educated and older women (Hwang 2002; Gum 2002).

In all, this study is largely made up of two sections. The first part presents the documentation of the pattern of married women's labor from 1980 to 2005 based on the

Census data, while the second half analyzes the various social factors and demographic information of samples to see how these affect married women's labor. The effect brought on by sub-groups is discussed as well.

II. Data Description and Definition of Labor Force Participation

This study is mostly based on the Population and Housing Census (henceforth referred to as Census), provided by the National Statistics Office of Korea (KNSO) in the span of 5 years. The KNSO in particular, has provided the micro samples of the census since 1980, so there is a total of six years' worth of micro samples made as the principal basis in the empirical analysis of the labor force participation patterns of married females.

This analysis included married women aged 25 to 54 with living spouses. This is to determine how spouses affect labor supply decisions of married women. This analysis nonetheless, does not include married women without spouses, making it possible that the labor supply is evaluated as smaller than the actual labor supply of married women.

Likewise included are the following categories in labor force participation: (a) working (b) working occasionally while taking care of household affairs (c) working occasionally while going to school (d) working occasionally while doing other things (e) temporarily absent from work and (f) seeking a job. The following categories are regarded as non-participation: (g) housekeeping (h) schooling and (i) not working for other reasons, such as old age or sickness.

Worth mentioning is the census data's limitation in that it lacked working hours, so it is important to classify full-time and part-time workers. Nevertheless, classification of full-time and part-time workers is available only for the years 1985, 1990 and 1995, with the percentages of part-time workers estimated from each data being 1.79%, 2.75%, and 2.17% respectively. These are too small to produce significant changes in the analysis so the classification is ignored. Yet, it is possible that the portion of part-time jobs among women has increased after the financial crisis in 1997, with several studies showing the

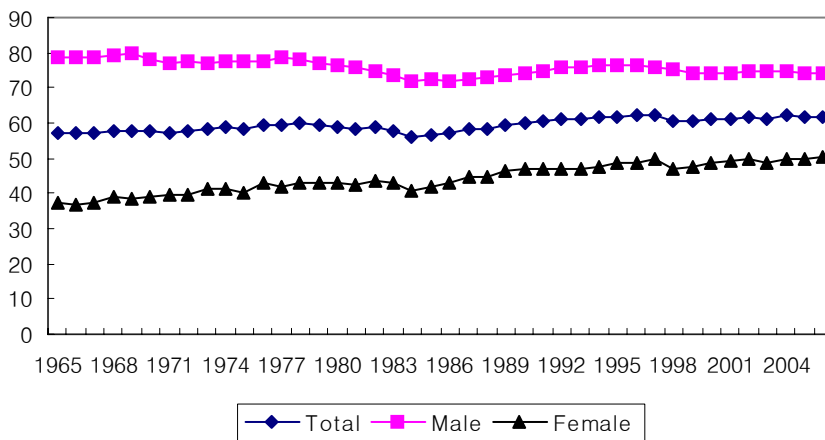
positive effects that the availability of part time jobs has brought on women's labor (Hwang 2003; Jamoutte 2006). Thus, it should be noted that unavailability of classification for part-time work could be a limitation in the analysis of data, especially in the years 2000 and 2005.

III. Trends in Married Women's Labor Supply Pattern

1. Overall Pattern

[Figure 1] presents the labor force participation rate (LFPR) changes from 1963 to 2006. While the LFPR of male has decreased by about 4% (from 78.4% to 74%), the LFPR of female has increased by 13.2% point during the same time period. This contrasting pattern between males and females is not different from the experiences of other developed countries experiences (Goldin 1990; Costa 2000).

(Fig. 1) Change of LFPR: 1963-2006



Source: Annual Report on Economically Active Population Survey, Korean National Statistics Office

It is also noteworthy that the LFPR of women has increased both among married and unmarried women. However, the LFPR of married women has increased more than that of unmarried women, in that the LFPR of the former has increased by about 30% over a span of 25 years, while that of the latter has increased by only 5%. This is one of the important labor supply features of married women.

〈Table 1〉 LFPR of Women by Marital Status

	Unmarried		Married	
	Participation	Unemployment	Participation	Unemployment
1980	50.8	-	40	-
1985	44.7	7.1	42.5	0.6
1990	46.5	5.2	49.2	0.6
1995	50.4	4.6	49.5	0.6
2000	48.1	7.4	51.2	2.4
2001	49.4	6.9	51.6	2.1
2002	50.8	6	52.1	1.5
2003	51.9	7.3	50.8	1.8
2004	53.5	7.2	51.3	1.9
2005	53.6	7.1	51.4	1.9

2. By Education Level

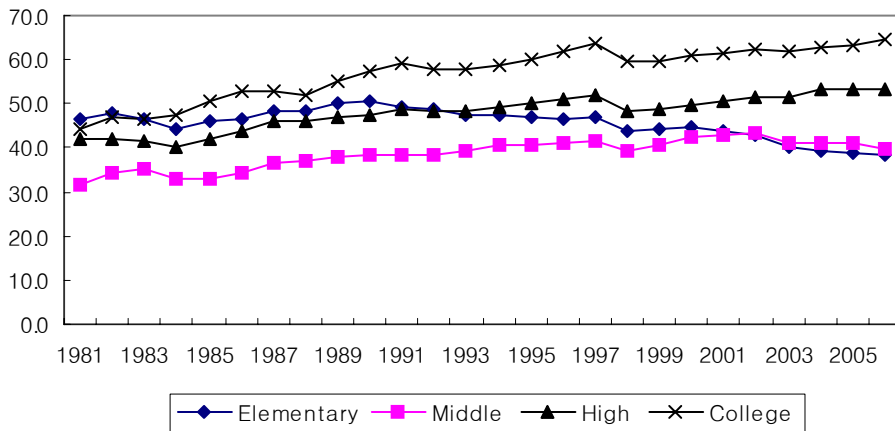
Korean women's educational level showed significant growth. High school graduates among women born in 1981-1985 amounted to 99%²⁾ and college graduates among the cohort group born in 1976-1980, which is the youngest group included in this analysis, exceeded 60%. Overall the increase of educational level affects labor supply behavior of women.

Census data is lacking information of income level. Among other information providing in Census reports, education level is most closely related with income level. In this sense, using education level to analyze married women's labor could bring meaningful results though some problems. According to the labor supply theory, educational level generally

2) Annual Report for Education Statistics, Korean Ministry of National Education Human Resource.

brings accretion in human capital, therefore a high educational level relates positively with labor force participation, especially with male labor (Pencavel 1986). In addition, female labor also becomes positively related with educational level though not as pronounced as that in males.

(Fig. 2) LFPR of Women by Education Level



Source: 2005, Report on Social Statistics Survey; Education Section, Korean National Statistics Office

In contrast, labor force participation of married women resulted differently with concern to educational level in that there is a negative rather than positive relation. Specifically, married women with higher educational levels such as college or high school graduates showed lower LFPR than married women with lower educational levels.

<Table 2> Married Women’s LFPR by Education Level

	1980	1985	1990	1995	2000	2005
No Schooling	54.55	63.75	59.56	59.01	53.46	55.65
Elementary School	37.47	46.25	48.14	55.17	56.53	59.43
Middle School	17.23	21.62	28.24	39.85	47.26	49.97
High School	11.49	13.74	18.28	27.56	35.33	39.43
College	22.25	23.67	25.97	33.07	36.99	39.95

This behavior is closely related to the non-labor income level of married women. On the basis of human capital accretion, a higher educational level is closely related to more work by substitution effect. This, as shown above, is untrue of married women with higher educational attainment especially college graduates, who displayed the lowest LFPR. It is possible that there is a relation to non-labor income.

A female with a highly educated male spouse has a strong incentive not to work because of higher non-labor income than that among less educated women. Marriage as a positive assortative mating process strengthens the hypothesis. In fact, over 90% in the data who graduated from college married men who are likewise college graduates.³⁾ Therefore, the educational level of spouses should be included aside from that of the women in the analysis.

〈Table 3〉 LFPR of Married Women by Education Level of Spouses

	1980	1985	1990	1995	2000	2005
No Schooling	56.28	66.2	63.58	62.59	55.08	56.1
Elementary School	44.56	54.4	53.8	59.08	59.72	61.62
Middle School	26.08	30.21	35.31	45.41	50.09	52.65
High School	18.11	19.63	23.29	31.84	38.58	42
College	14.42	16.29	20.05	28.03	34.36	37.95

As expected, the LFPR by spouses' educational level revealed a pattern similar to the LFPR by educational level; women with highly educated male spouses exhibited the lowest level of LFPR. It is worth mentioning that traditionally, the social norm in Korea strictly segregates men's work to outside of the home, and women's work inside. Interestingly, married women's employment also becomes a pointed indication of their husbands' abilities as providers (Goldin 1990). Nevertheless, there are significant changes in the patterns among wives of highly educated men.

3) Matching between college graduated women and men by years

1980	1985	1990	1995	2000	2005
0.9555	0.951	0.9468	0.9296	0.9063	0.9014

Source: micro sample of census data for each year.

In the LFPR account, women with highly educated spouses displayed lower level of LFPR. The changing pattern however noted a difference; LFPR's changing rate is highest among women with college graduate spouses, albeit the actual rate is the lowest.

Additionally, through assessment by cohort group, women who are college graduates showed the highest LFPR among the most recent cohort group. In particular, college graduates in the recent three cohort groups, born from 1966 to 1980, and whose ages range from their early 40s to late 20s, revealed the highest LFPR, even higher than among the high school graduates.

<Table 4> LFPR by Education Level and Cohorts

	High school	College
Born in 1976-1980	27.83	39.39
Born in 1971-1975	28.3	34.27
Born in 1966-1970	31.99	34.05
Born in 1961-1965	34.21	33.03
Born in 1956-1960	31.77	27.81

This shows a new labor pattern among married women. There may be various reasons why the labor supply pattern has been changed. It may be the result of higher divorce rate or a recessed economy or change in social norms. It is also possible that the labor supply decisions of married women become less sensitive to their husbands' income, or that the income effect from the spouses' income has diminished as shown by Blau and Khan (2005). Many studies conducted in the U.S show similar pattern. According to Juhn and Murphy (1997) and Costa (2000), women in the U.S with spouses who finished college or beyond showed the highest increase in labor force participation in the 1960s.

It seems that growth of education level is one and crucial reason of labor supply increase of married women also in Korea. As overall education level of female grows, market wages also increase. Increased market wages are expected to have larger substitution effect on women's labor supply. If substitution effect that comes from raised wage offsets income effect coming from spouses' income, then it can be shed light on the increase of LFPR. Moreover, not only the substitution effect of own wages on married

women's labor supply begin to fall, but married women are less sensitive to their husbands' wage or income. I will discuss about it more precisely in the later part.

3. By Residential Areas

Labor supply of married women is considerably different between urban and rural areas. The LFPR for the women included in the analysis varies by almost two folds. For the urban area, LFPR of married women is 29.95% while that for the rural area is 54.14%. In the sense, it is needed to try to analyze married women's labor of these two areas separately. The census reports classify lands into three administrative categories according to the degree of urbanization: dong, eup, and myon. In this study, eup and myon are classified as rural areas and dong is included in the urban areas. These areas differ in demographic structure and the nature of available jobs, and it is these differences that possibly influence married women's labor. To begin with, aging in rural areas could possibly promote married women's labor participation, that is shown in <Table 5>, where older married women show higher labor force participation compared to married women in urban areas.

<Table 5> LFPR by Age and Residential Area

age\area	1980		1985		1990		1995		2000		2005	
	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural	urban	rural
25-29	0.1021	0.279	0.115	0.3601	0.1685	0.2609	0.2371	0.2365	0.2898	0.2665	0.3534	0.3147
30-34	0.1568	0.3989	0.1623	0.4971	0.2112	0.3638	0.2853	0.3358	0.3201	0.3539	0.3333	0.3821
35-39	0.1868	0.4904	0.2035	0.5932	0.2691	0.4701	0.3447	0.459	0.4032	0.4786	0.4016	0.5253
40-44	0.2097	0.5455	0.2266	0.6857	0.2837	0.554	0.3716	0.5397	0.4319	0.5556	0.4464	0.6499
45-49	0.168	0.5615	0.211	0.7227	0.2744	0.596	0.3407	0.5536	0.3983	0.5852	0.4123	0.6914
50-54	0.1607	0.5361	0.1821	0.7108	0.2218	0.6031	0.2972	0.5689	0.3117	0.5339	0.3303	0.7056

Employment status structure could also promote the labor supply of married women in rural areas. Women in these areas who participate in labor are typically either in the state of self-employment or are unpaid family workers. The share of unpaid family workers in

rural areas exceeds 24% compared to the 5.6% in urban areas. The difference in employment structure even allows for more flexible labor supply, thus the greater labor participation of married women.

This study aimed to determine the difference between rural and urban areas concerning the effects of labor supply decision of married women. Analysis separate for the urban and rural areas is applicable in this regard and is undertaken in the latter part of this study.

IV. A Regression Model of Labor-Force Participation Decisions

In this section, this study estimated how a number of potential factors in labor force participation decisions affect the probability of labor force participation, such as age, education, education level of spouse, number of children, age of the youngest child, residence in rural areas. Also considered in this study are the time and cohort effects on the economic activity of married women. The results of this analysis did not only reveal the patterns of labor force participation at a particular time, but also provided useful insights into the cause of changes in the LFPR of married women over time. The Population Census 2% micro sample is employed to analyze labor supply, as well as restrict samples to married women aged 25-54, with spouses present and who are not the head of the household.

The study began with a simple standard model of labor force participation decisions based on a choice between work and leisure. At any date, a person will choose either participation or non-participation based on his or her utility associated with each option. Utility when working can be written as;

$$U_w(Y, NI, H; \mathbf{Z}) \tag{1}$$

and utility when not working as

$$U_l(0, NI, 0; \mathbf{Z}) \quad (2)$$

where Y is labor income, NI is non-labor income, H is the number of hours of work in the labor market and \mathbf{Z} is a vector of demographic and socioeconomic variables affecting utility. A decision function could be given as :

$$I^* = U_L(0, NI, 0; \mathbf{Z}) - U_W(Y, NI, H; \mathbf{Z})$$

Although the value of I^* is not observed, a discrete participation indicator is observed, given as $I^* = 1$ if $I^* < 0$ and $I^* = 0$ if $I^* \geq 0$, where 1 represents labor force participation, 0 represents non-participation.

The decision function evaluated by the individual could be presented specifically as

$$I^* = U_L(0, NI, 0; \mathbf{Z}) - U_W(Y, NI, H; \mathbf{Z}) = -X\beta - A\alpha - CA\gamma - CN\delta - UR\eta - RP\mu + \varepsilon \quad (4)$$

where X is a vector containing proxy variables for income, A is a matrix of age dummies, CA is a matrix of age of the youngest child, CN is matrix of number of children dummies, UR is a dummy for rural residence and RP is a dummy variable for co-residence of (spouse's or married women' own) parents. Additionally, $\alpha, \beta, \gamma, \delta, \eta, \mu$ and ε are parameter vectors and ε is an error term. Using the indicator function, I , the effect of variables are estimated by means of logit.

$$\begin{aligned} Prob(I=1) &= Prob(\varepsilon < X\beta + A\alpha + CA\gamma + CN\delta + UR\eta + RP\mu) \\ &= \frac{\exp(X\beta + A\alpha + CA\gamma + CN\delta + UR\eta + RP\mu)}{1 + \exp(X\beta + A\alpha + CA\gamma + CN\delta + UR\eta + RP\mu)} \end{aligned}$$

In the regression analysis, certain variables are included as follows. The first is age, which is a dummy variable for each five-year age interval. If age were to be included as

a continuous variable, there would be a significant change in results; this is attributable to the large variation of female labor force participation among age groups and the considerable increase in labor supply especially in women beyond the age of 40. Age, therefore, is included as a dummy variable to establish the difference according to age level.

Education attainment is represented by dummy variables, denoted “No Schooling”, “Elementary School”, “Middle School”, “High School” and “College”.⁴⁾ The education level is an unstable substitute for income level, as the direction of effect of education depends on the relative magnitudes of the substitution and income effects. However, the income effect is, to some degree, controlled by spouses' educational level. It is well documented that in male labor, the degree of education is positively related to the size of labor supply (Pencavel 1986). In this regards, the male spouses' educational level could cover to a limited extent the income of their female spouse which could serve as the main share of the non-labor income of married women.

More often than not, child rearing remains a significant burden to women than to men in Korea. This is on the basis of the traditional social norm, wherein work in the home is relegated to women. Consequently, child rearing remains a main deterrent to female labor force participation (Hwang and Choi 1998; Hwang 2003). The age of children also dictates significant differences in invested goods. In general, rearing of children under the age six, requires time-intensive investment, whereas good-intensive investment is called for following the child's entry in school. In this sense, a woman who has a young child could reduce labor force participation, with the decision to reenter the labor market according to the growth of her child. As a result, women ages late 20s to early 30s and who concentrate on child rearing activities typically reduce labor force participation significantly. This study also determined the effect of having a child wherein the age of the youngest child is included. The ages of the youngest child are then divided into five groups: ages 0-2, 3-6, 7-10 (the age when children start their schooling in Korea), 11-18, and over 19.

4) “College” included people whose education attainment level exceed college, e.g. graduate school, and other attainment level includes people graduated.

Likewise included is the number of children as a dummy variable that is no children, one child and over two children. A dummy is also used for co-residence of either the women's or spouses' parents in terms of their support in child rearing. It is worth mentioning though that according to Korea's traditional social norm, supporting an old parent is regarded as the children's obligation. Once the son lives with his parents, could present another burden to the female spouse who the naces for her spouse's parents. Co-residence with parents could thereby be an impediment to the women's labor force participation. A dummy variable on rural dwelling is then included to measure the difference in characteristics between the rural and urban areas.

It should be noted that the regression model employed in this study is subjected to inadequate information concerning a number of key determinants of labor supply decisions, specifically the lack of specific income data. Indeed, the proxy variables employed in the analysis, such as educational level, could be incomplete measures of labor and non-labor incomes. In spite of the limitations, the results of the regression given below, if interpreted carefully, should be useful in understanding the reasons for the long-term change in the LFPR of married women since the 1980s.

V. Regression Results

<Table 6> presents the results of pooled-sample logistic regressions. The year dummy captured Korea's various social, economic, and institutional changes as well as the changing patterns of public policies such changing patterns include protection for maternity that influence labor force participation decisions of married women. By allowing these variables, the potential business cycle effect on labor force participation of married women could also be considered.

Age dummies also showed a positive relationship to the labor force participation compared to the 25-29 age groups, though dissimilar in the 50-54 age group. This result revealed as well that married women in the 25-29 age group are most likely non-participating in the labor market, concurrent with the pattern of low labor supply of

<Table 6> Pooled Sample Logistic Regression Result

Parameter	Mean	$\partial P / \partial X$
Age		
25-29	0.169	NI
30-34	0.21	0.15**
35-39	0.199	0.227**
40-44	0.173	0.234**
45-49	0.142	0.077**
50-54	0.108	-0.18**
Education level		
No schooling	0.037	0.761**
Elementary	0.226	0.383**
Middle school	0.211	0.071**
High school	0.374	NI
College	0.153	0.629**
Spouse's education level		
No schooling	0.024	1.178**
Elementary	0.15	0.81**
Middle school	0.161	0.23**
High school	0.379	NI
College	0.284	-0.221**
Age of youngest child		
0-2	0.185	-0.62
3-6	0.193	-0.373**
7-10	0.167	-0.213**
11-18	0.252	-0.134**
over 19	0.104	-0.294**
Number of children		
0	0.056	NI
1	0.165	0.054*
2	0.444	-0.02
Over 3	0.334	0.176**
Rural residence	0.216	1.533**
Coresidence with parent	0.123	0.682**
Year dummies		
1980	0.121	NI
1985	0.187	0.401**
1990	0.164	0.535**
1995	0.179	1.637**
2000	0.182	2.432**
2005	0.167	2.707**
N	812,766	

Note: Significant level, + 10%, * 5%, ** 1% , NI Stands for “Not Included”.

married women aged 25-29.

The association between education and labor supply of married women showed a strongly positive relationship. As for the college graduates' strongly positive relationship with labor supply, this showed that if other variables are controlled, higher education also positively affected labor supply decision even in married women. However, disparity is observed in terms of the spouses' educational level. Spouses who have below middle school educational levels have a strongly positive relationship with the labor supply of married women, whereas the relationship turned negative for married women with college-educated spouses. It could explain for the dominant pattern in married women's labor supply. Women with highly educated spouses also exhibited lower labor supply compared to other women, partly due to the income effect coming from spouses' income, that is married women's non-labor income.

Other variables showed anticipated results. With regard to the age of the youngest child, a child aged 0 to 2, who needs intensive time-spending care, reduces the probability of labor participation by about 62%. As the youngest child gets older, the magnitude of negative effects significantly decreased but still exhibited a significantly negative association with married women's labor supply. The presence of more children is also a main determinant of labor supply decision of married women. Generally, the rearing of more children poses as an incentive to work because of cost. The regression result supports this, though the effect is not significant. Meanwhile, residence in rural areas has strong positive effects on married women's labor supply. This result can be explained by the differences between urban areas and rural areas. The difference in employment structure may bring positive effects in the rural area. In Korea, self employment frequently is the prevalent mode of employment structure especially in the rural areas with the industrial structure is focus on agriculture. In this case, married women have additional opportunities in labor participation as unpaid family workers.⁵⁾

This is also supported by rapid population aging in rural areas necessitating continuous

5) Among working women included in this analysis, proportion of unpaid family worker varies a lot between rural and urban areas. For rural residing women, unpaid family workers amount to 24.5% of working women whereas, 5.6% for urban residing women.

work in older males, and is then the main reason behind Korea's high LFPR in older males as observed by Lee (2007). Labor shortage caused by aging may also bring about more labor participation among married women in rural areas. A regression analysis is again conducted in the latter part of this study to specifically observe the difference between the rural and urban areas. Co-residence with parents is seen to positively relate with married women's labor supply. This suggests that parents might take the role as supporter in child nurturing or home affairs, in support of the labor force participation of married women. The result is concurrent with those of Sung and Chah (2001), whose investigation employed the KLIPS data as basis.

The regression analysis is again attempted separately on urban and rural areas to determine the difference between the two. As shown above, rural residence has significantly positive effects on the labor supply of married women. There are possible explanations for the difference between the two areas, industry, employment pattern, and age structure among them. <Table 7> illustrates the results.

First, age dummies showed a different pattern between urban and rural areas, particularly for the relatively older women aged 45 to 49 and 50 to 54. In urban areas, these ages are negatively related to odds for labor supply, quite the reverse in the rural areas where there is a positive relationship. Additionally, in the 50-54 age group, the coefficient is -0.346, in the rural areas, the estimate coefficient is 0.195. These differences are attributable to rapid aging in Korea's rural areas. Lee (2007) further supports this, revealing that the population aging in rural areas caused by rural-urban migration has increased the LFPR of older men in rural areas. This result is consistent with the hypothesis suggested by Lee (2007). Labor shortage coming from migration and aging has caused not only increased labor in older men but in women as well, especially the older women's odds of labor participation in rural areas.

On the other hand, the association between educational level and labor market activity of married women is not markedly different between rural and urban areas. In both areas, positive relationship is found between labor supply and educational level, albeit with some differences in magnitude. Women in the rural areas, particularly those with no schooling

〈Table 7〉 Pooled Sample Regression by Residence Areas

	Urban	Rural
Age		
25-29	NI	NI
30-34	0.143**	0.151**
35-39	0.167**	0.303**
40-44	0.107**	0.469**
45-49	-0.09**	0.434**
50-54	-0.346**	0.195**
Education level		
No schooling	0.101*	1.508**
Elementary school	0.151**	1.037**
Middle school	0.069**	0.289**
High school	NI	NI
College and over	0.581**	0.485**
Spouse's education		
No schooling	0.741**	1.195**
Elementary school	0.501**	0.93**
Middle school	0.226**	0.277**
High school	NI	NI
College and over	-0.224**	-0.251**
Age of the youngest child		
0-2	-0.668**	-0.452**
0-3	-0.407**	-0.248**
7-10	-0.227**	-0.155**
11-18	-0.089**	-0.18**
over 19	-0.192**	-0.354**
Number of children		
No child	NI	NI
1	0.061+	0.104*
2	-0.06*	0.253**
Over 3	-0.008	0.793**
Co-residence with parents	0.511**	0.905**
Year dummy		
1980	NI	NI
1985	0.135**	1.002**
1990	0.643**	0.656**
1995	1.569**	1.296**
2000	2.359**	1.823**
2005	2.594**	3.078**
N	603,661	208,505

Note: Significant level, + 10%, * 5%, ** 1% , NI Stands for "Not Included".

or who only attended elementary school are far more likely to participate in labor supply than the same group of women in urban areas. This is related to the industrial structure in rural areas wherein formal education is less important in rural areas than urban areas, due to a larger fraction of the population that is self-employed such as farmers (Lee 2007).

Concerning the age of the youngest child, two areas showed similar result though with different magnitudes. In the urban areas, the negative association between the age of the youngest child and labor force participation is stronger for all younger groups (under the age 10) in urban areas. The number of children likewise demonstrated different effects on the labor supply of rural women and urban women. For urban women, the negative effect of having more children exists even though this is not significant. Yet, there is a strongly positive effect on the probability of labor supply for rural women. The employment structure in the rural area could provide an explanation for this difference; self-employment is the major form of employment in rural areas where agriculture is the main industry. For that reason, married women in these areas find it more convenient in keeping pace with house affairs while simultaneously at work as opposed to women residing in urban areas. This, in turn, enables child rearing, thereby producing less negative effects on rural residing women.

Co-residence with parents has also a strongly positive effect on the labor force participation of married women in both areas, though again, the magnitude is greater in the rural areas. The effects of year dummies additionally showed a similar pattern in rural areas as compared in urban areas.

In summary, difference between rural and urban areas could be explained by differences in variables, age and educational level, among others. Although every variable is partly responsible for the difference, aging and difference in rearing children could be the main reasons for the difference between the two areas.

Regression analysis is again performed on the 1980, 1985, 1990, 1995, 2000 and 2005 data sets to observe the changes regarding the effects of variables on married women' labor supply. <Table 8> charts the results of yearly logistic regressions.

Age is positively related to the odds of labor force participation as is noted in the pooled sample regression for each year. However, the size of these effects varied by the

〈Table 8〉 Logistic Regression Results by years

Parameter	1980	1985	1990	1995	2000	2005
Age						
25-29	NI	NI	NI	NI	NI	NI
30-34	0.319**	0.285**	0.136**	0.181**	0.081*	0.022
35-39	0.478**	0.396**	0.199**	0.182**	0.087*	0.033
40-44	0.644**	0.512**	0.184**	0.112*	-0.033	-0.043
45-49	0.465**	0.473**	0.091	-0.051	-0.218**	-0.228**
50-54	0.239**	0.283**	-0.113+	-0.203**	-0.478**	-0.45**
Education						
No schooling	0.934**	0.879**	0.924**	0.093	-0.074	0.096
Elementary school	0.547**	0.537**	0.688**	0.274**	0.178**	0.319**
Middle school	0.091	0.135**	0.205**	0.139**	0.14**	0.162**
High school	NI	NI	NI	NI	NI	NI
College and over	2.12**	1.737**	1.216**	0.729**	0.396**	0.384**
Spouse's education						
No schooling	1.113**	1.234**	1.468**	0.82**	0.347*	0.241
Elementary school	0.793**	0.868**	0.891**	0.484**	0.439**	0.434**
Middle school	0.212**	0.233**	0.288**	0.251**	0.169**	0.195**
High school	NI	NI	NI	NI	NI	NI
College and over	-0.302**	-0.298**	-0.253**	-0.237**	-0.185**	-0.176**
Age of the youngest child						
0-2	-0.263**	-0.413**	-0.672**	-0.51**	-0.731**	-0.779**
3-6	-0.069	-0.237**	-0.489**	-0.126**	-0.441**	-0.575**
7-10	-0.075	-0.11*	-0.382**	0.074	-0.258**	-0.352**
11-18	-0.189**	-0.133**	-0.366**	0.269**	-0.092*	-0.185**
Number of children						
No child	NI	NI	NI	NI	NI	NI
1	-0.186*	-0.07	0.349**	-0.261**	0.247**	0.302**
2	-0.14	-0.131*	0.244**	-0.387**	0.158*	0.247**
Over 3	0.13	0.149*	0.637**	-0.342**	0.227**	0.452**
Rural residence	2.088**	3.489**	1.073**	0.49**	0.402**	0.892**
Co-residence with parents	0.63**	0.739**	0.687**	0.591**	0.531**	0.734**
N	107,141	166,298	104,620	140,397	144,941	148,514

Note: Significant level, + 10%, * 5%, ** 1% , NI Stands for "Not Included".

year, the amount of positive effects decreased every year, and negative effects for the older ages since 1990 are seen. This change could be viewed in two ways. The first view is the change caused by increased labor supply among the 25-29 age group. Women in this group displayed a significant increase in labor supply due to postponed marriages and pregnancies. Thus, fewer women are in the margin of participation and non-participation. Another explanation is the difficult re-entry in the labor market. Following 1990, the odds in labor force participation for some age groups exhibited a negative relationship, much more so for the year 2000 and 2005, when the 40-44 age group was associated with negative odds for labor participation. In the aspect of these age groups' likely re-entry, this negative coefficient could serve as evidence that married women are experiencing hardships in labor market re-entry after a career interruption, particularly after the 1997 Economic Crisis in Korea.

Educational level is likewise positively related to the odds of labor supply of married women. Nonetheless, the estimated coefficient concerned with educational level changes over time. This study then paid particular attention to college and post college educational levels. It is interesting to note that with college graduate educational levels, these revealed different results on the basis of the Korean notion concerning married women labor, that is, more educated, less work.

There is a significantly positive relation between education and labor supply. The size of this positive effect however rapidly decreased in the span of 25 years. In 1980, the effect of college education on married women's labor supply is 2.12 and in 2005, it is 0.384. This implied that recently, more college-educated women participated in the labor market, with fewer women on the participation and non-participation margins.

Furthermore, the difference between the result of the estimated coefficient of educational level and the stylized fact in married women labor could be explained by determining the spouses' educational levels. This illustrated a positive relation in all educational levels except college. Women with poorly educated spouses are more likely to be in the labor market, whereas women with college educated spouses showed a negative association with labor supply for all years' regression analyses. Yet, the size of the negative effect significantly changed over years. Of late, higher educational levels of male

spouses have less negative effects on married women's labor supply. The change in odds of labor participation has altered nearly twofold, and is similar to the experiences of other advanced countries. Another possible explanation could be found in other studies such as those by Juhn and Murphy (1997), and Blau and Kahn (2005). Of late, there has also been a noted increase in the number of college educated women, usually the wives of highly educated men. This could be due to less sensitivity on the married women's part in terms of their husband's income. In relation to this, Balu and Kahn (2005) explained the increase in labor supply of married women. It is apparent from the results that there is a reduced dependence on the husbands' income, and this pattern would seemingly continue in the future.

As for the age of the youngest child, this yielded the expected result: the younger the child, the more likely are married women to give up outside work. Children in the 0-2 age group need intensive care, one that usually burdens down the mother. Therefore, as the child grows older and the burden of child nurturing decreases, the odds of labor supply increases.

It is interesting to note the increased negative effect of the presence of children aged 7 to 10 over the years. Generally, when children aged 7 to 10 enter school, the mother's nurturing burden starts to diminish. Not so according to the regression result, which showed significantly negative effects on the odds of labor supply. Moreover, the negative magnitude increased throughout the years, with the exception of the 1995 result. It is supposed that there are two possible ways to explain this pattern: first is the difficult re-entry in the labor market. When a woman experiences a career interruption because of marriage or pregnancy, an attempt is made to re-enter the market as her child grows up. This attempt could prove difficult especially for women who used to hold office jobs in that the chances of getting the same employment are small (Hwang 2004). In addition, the magnitude of negativity increases by the year. This pattern may serve as evidence that re-entry in the labor market becomes harder. The other possible explanation is the postponed nurturing burden. In Korea, children's education has recently become a very important parental issue requiring active participation of parents in elementary school. This may also be a deterring factor for married women with regard to labor market

participation. As for the number of children, results displayed mixed results. Until 1985, it could be expected result that children could serve as deterrents for the labor supply of married women, yet large numbers of children could also serve as incentives to labor supply. This pattern, however, has not appeared since 1990.

Rural residence is also included in the determination of the difference between urban and rural areas, as it posed a strongly positive effect on married women's labor. In particular, the difference between industrial structures, average educational level, and social norms of these areas could affect the labor supply of married women. This could be partly exemplified by the mass migration of the younger people to the urban areas. According to Lee (2006), older males are compelled to continue work with the loss of family labor and with accelerated population aging in rural areas. Under these circumstances, it is possible that married women are forced to participate in the labor supply.

Also included in the study are the parents of either the married women or their spouses. These parents could act as supporters in home affairs or child rearing, or simultaneously as dependents. The result revealed that parents are more likely to be supporters to the married women's labor supply. In fact, co-residence with parents has a strongly positive effect on married women's labor. This result even signified that parents possibly take active parts in child rearing or house affairs. Recent social statistics in Korea also supports this result about 40% of women depend on their parents in rearing children.

The most significant changes over the years are the magnitude of effects in the women's and their spouses' educational levels. These effects may serve as the main reasons behind the increase in married women's labor supply.

A regression analysis by cohorts is again undertaken with particular emphasis on recent cohorts, which are different from the other cohorts in various demographic factors such as birth rate and educational level. The difference in major demographic factors may influence the labor supply decision of married women. To determine the difference, included are five cohorts born after 1956. Each group included women born from 1956 to 1960, 1961-1965, 1966-1970, 1971-1975 and 1976-1980.

<Table 9> presents the logistic regression results. The spouses' educational level and variables related to children showed a significant difference by cohort groups. The negative effects concerning odds of labor supply coming from the spouses' higher educational level, especially for college graduates, are reduced by the cohorts. In

<Table 9> Logistic Regression Result by Cohort Groups

	Born in 1956-1960	Born in 1961-1965	Born in 1966-1970	Born in 1971-1975	Born in 1976-1980
Age					
25-29					
30-34	0.346**	0.689**	0.341**	0.112**	
35-39	1.361**	1.231**	0.378**		
40-44	2.05**	1.293**			
45-49	1.855**				
50-54					
Education					
No schooling	0.109	-0.181	-0.368	-0.462	-0.748
Elementary school	0.278**	0.226**	0.06	-0.185	0.461
Middle school	0.081**	0.081*	0.07	0.024	-0.277
High school					
College and over	0.476**	0.474**	0.4**	0.51**	0.437**
Spouse's education					
No schooling	0.404*	0.58*	0.352	0.801	2.218
Elementary school	0.628**	0.334**	0.323*	0.241	0.186
Middle school	0.184**	0.165**	0.258**	0.343*	-0.087
High school					
College and over	-0.273**	-0.2**	-0.027	0.087*	0.247**
Age of the youngest child					
0-2	-0.579**	-0.707**	-0.825**	-0.9**	-0.938**
3-6	-0.404**	-0.505**	-0.649**	-0.791**	-0.857**
7-10	-0.248**	-0.354**	-0.486**	-0.655**	-0.785**
11-18	-0.099*	-0.18**	-0.322**	-0.606**	-0.447
over 19	-0.163**	-0.198*	-0.489+	-0.747	
Number of children					
No child					
1	0.243**	0.495**	0.918**	2.083**	3.126**
2	0.234**	0.368**	0.658**	1.468**	1.872**
over 3	0.484**	0.588**	0.806**	1.759**	2.792**
rural residence	1.192**	0.575**	0.354**	0.187**	0.048
Co-residence with parents	0.765**	0.824**	0.955**	1.108**	1.008**
N	153,840	115,032	84,198	45,815	11,330

Note: Significant level, + 10%, * 5%, ** 1% , NI Stands for "Not Included".

particular, the most recent cohorts, those born in 1971-1975 and 1976-1980, exhibited positive coefficients, which are 0.087 and 0.247, respectively. This change is apparently irreversible, with a fixed pattern to married women's labor supply. Contrary to the positive effect coming from spouses' educational level, the presence of a younger child is still a major deterrent in labor force participation of married women. The magnitude of negative effects gets larger by cohorts.

VI. Conclusion

This study estimated the labor force participation rate of married women from 1980 to 2005 as well as analyzed the effect of its several determining factors. The most remarkable result is the continually increasing LFPR of married women and the reduced negative effects coming from the spouses' high education level. This pattern is similar to the experiences of women in advanced countries since the 1970s.

According to the regression results, the rise in the LFPR of married women is largely explained by the decreased income effect of highly educated spouses. This pattern is sharply distinct in recent cohort groups who are born after 1970s. The negative effect of the spouses' educational level, which is a proxy variable for the spouses' income level, decreased yearly by cohorts, the coefficient becomes positive especially for two cohorts, those born in 1971-1975 and 1976-1980. This pattern is expected to be irreversible and continuous. Based on the analysis, it is certain that in the near future, the LFPR of married women in Korea would increase up to the level of the LFPR of married women in advanced countries. This may prove to be a solution for the rapidly aging and shrinking Korean labor force.

There remained, however, strongly negative effects on the decision for labor force participation in married women regarding younger children. Additionally, the magnitude of negativity increased by years and by cohorts. Thus, to boost up the labor participation of married women, the issue concerning child rearing should be initially addressed.

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abstract

기혼 여성의 경제활동참가 행동변화 분석: 1980-2005

권 정 현

이 논문은 1980~2005년까지 기혼여성의 경제활동참가 행동의 변화에 대해 통계청의 인구주택총조사 마이크로 샘플 데이터를 이용하여 분석하였다.

기혼 여성의 경제활동참가는 꾸준한 증가를 보였으며, 특히 고학력 대졸 여성의 경제활동참가가 빠르게 증가해 왔다. 또한 남성 배우자가 고학력인 기혼 여성의 경제활동참가가 증가해, 기존의 기혼 여성 경제활동의 주요 특징이었던 “고학력일수록 낮은 수준의 경제활동참가”와 다른 패턴을 보인다. 이러한 변화는 분석에 포함된 기혼 여성 가운데에서도 최근 코호트에게서 강하게 나타난다. 배우자의 특성이 기혼 여성의 경제활동참가 결정에 있어 영향력이 줄어들고 있는 반면, 자녀의 존재는 여전히 기혼 여성의 경제활동참가의 장애 요인으로 나타난다.

주제어: 기혼여성, 센서스, 노동