Trends in the Labor Force Participation of Married Women with Young Children in Taiwan: The Role of Educational Expansion

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Abstract

Using two waves of the Women's Marriage, Fertility, and Employment Survey, I examine trends in the labor force participation of married women with young children between 1983 and 2006 in Taiwan. I find that the educational expansion that has benefitted Taiwanese women helps explain the trends, but changes in other family life cycle, demographic, and economic factors are largely parallel to the changes in the labor force participation of married women with young children in Taiwan.

Introduction

The labor force participation rates of Taiwanese women have risen continually in the past few decades. Such changes were the greatest among women between age 25 and 45—a woman's primary life stage for marriage and childbearing (see, also, Figure 1). Previous studies show that over half of the Taiwanese women who were employed before marriage would leave the labor market after marriage or after having a baby (Chien and Hsueh 1996); and some of these women with an interrupted career would return to work after their children reach the school age. Married women's career discontinuation would have a negative effect on their earnings even upon their return to the labor force. Hence, understanding women's labor force participation would contribute to our understanding of gender inequality in the labor force outcomes.

In this paper, I examine what factors explain the trends of labor force participation among married women with young children from 1983 to 2006, a 23-year period in which the overall labor force participation rates for women have increased from 41% to 48%.[1] The factors under scrutiny are concerned with the family life cycle, and the demographic and economic characteristics of married women with young children.

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[1] The figures are calculated by the author from the Women's Marriage, Fertility and Employment Survey (1983, 2006).

Background

There are three potential explanations of trends in the female labor force participation rates: (1) human capital perspective, (2) family life cycle perspective, and (3) normative perspective.

Human capital perspective posits that women make decisions on labor force participation on the basis of such economic factors as family income and individual wages (Mincer 1962). Expected earnings are often used to indicate the measure of individual wages: the higher their human capital, the higher their expected earnings, and the higher propensity for women to be in the labor force. Previous research also shows that man's education is a strong indicator of family income. The higher the man's education, the higher the family income, and the lower the probability of women to participate in market work.

The family life cycle perspective suggests that women tend to make different decisions during different stages of the family life cycle. During the stages of childrearing years, women's labor force participation is strongly correlated with the number and ages of their children (Waite 1980). Empirical studies find that due to the incompatibility between family and market work during the childrearing years, these family life cycle factors often have a strong and negative effect on women's labor force participation.

The normative perspective suggests that shared beliefs by members of the society

would affect women's decisions about market work versus family obligations. Implications of traditional norms on female employment tend to follow that "not only are there pressures on women to marry and bear children; there are also social pressure to be good mothers" (Sweet 1982). However, the opportunity of higher education often leads women to have modern sex role orientations. Hence, women with higher education are more likely to be strongly committed to their work rather than to their roles as mother and wife. Similarly, husband with higher education would be more likely to support his wife's intention to continue her work and career.

To adjudicate these three alternative explanations, I use married women's expected earnings to indicate the human capital factors, the number and ages of children to operationalize the family life cycle factors, and education to proxy the normative factors that affect the labor force participation of married women with young children. I seek to explain the trends in labor force participation of married women with young children between 1983 and 2006 in Taiwan—as indicated by a dummy variable for Calendar Year—by estimating models with and without interactions of these potential explanatory variables with the trend indicator of Calendar Year. Following the logic of Leibowitz and Klerman (1995): if the impacts of these aforementioned factors on labor force participation have increased together, then only the simple trend indicator of Calendar Year will differ from zero. Alternatively, if the growth in labor force participation has been greater for some

groups as indicated by the aforementioned factors than for others, the coefficients for those variables will also change over time.

Data and Methods

Women's Marriage, Fertility and Employment Survey of Taiwan

I use data from 1983 and 2006 waves of the Women's Marriage, Fertility, and Employment Survey, a repeated cross-sectional survey of nationally representative samples of women aged 15 and above residing in Taiwan.[2] The survey was administered via face-to-face interview. The survey included a wealth of information on women's labor force participation, marriage, childbirth status (not only first births), and family composition, and thus is suitable for the purpose of this study.

Previous studies have shown that the recent changes of women's labor force participation pattern are concentrated among married women with preschool-age children among which, the greatest increase in labor force participation is the mothers with very young children (Chien 2004; Leibowitz & Klerman 1995). Thus, I limit the analysis to married women with children 3 years or younger. I use listwise deletion to exclude cases with missing data on dependent variables or explanatory variables on married women's family life cycle, demographic and economic characteristics. The size of the analytic sample is 3,115 cases for the 1983 survey,

[2] The Women's Marriage, Fertility and Employment Survey was conducted by the Directorate-General of Budget, Accounting and Statistics Departments of Executive Yuan in Taiwan.

and 1,169 cases for the 2006 survey.

Dependent Variable: Labor Force Participation

I follow the Ministry of Interior Affairs of Taiwan's official definition to construct a binary dependent variable to indicate the respondent's labor force participation, coded 1 if she is in the labor force and 0 if not. The respondent was considered in the labor force if she is over 15 years of age, either working for pay or unemployed. Those women who were not working and did not intend to find a job were considered out of the labor force.

Explanatory Variables

I follow Leibowitz and Klerman (1995) to construct a series of explanatory variables to indicate factors that may help explain the changes in the labor force participation of married women with young children. These variables are as follow:

Number of children is based on the respondent's answer to the question of "How many children do you have?" I code the answer into three categories using two dummy variables: one child (reference category), two children, three or more children.

The survey included information on the age of respondent's first, second, third, and her youngest child. I create dummy variables to indicate the ages of children in six categories, including 0-6 months, 7-12 months, 13-18 months, 19-24 months, 25-30 months, and 31-36 months. Each of these dummy variables is coded 1 if the

respondent has any child who falls into the specific age category, and is coded 0 if not. Using this specification, I capture not only the age of the respondent's youngest child (which determines whether or not a married woman has any children younger than 3 years of age, the condition for a respondent to be included in my analytic sample) but the ages for all of her children.

The ages and education (measured in years of schooling) of the respondent and her husband are included as continuous variables. For those cases that did not have valid data on the husband's information of age and years of schooling, I substitute them with the mean of the analytic sample and create a dummy variable to flag these cases.[3]

I use a dummy variable to indicate time trend by calendar year—coded 0 if the respondent was interviewed in 1983, and coded 0 if the interview took place in 2006.

To examine the economic explanation of the trends, I draw data from the Taiwan Family Income and Expenditure Surveys in 1983 and 2006 to estimate the potential earnings opportunities in the local labor market of women. I estimate a series of Mincer's earnings equation for the local labor market in each of the two survey years. The predicted logged earnings is independent of a particular woman's personal preferences for work and family, and captures the average effect of educational attainment and work experiences on her local labor market earnings opportunities.

[3] All these cases had missing data on both age and education of their husband. No one had either age of the husband missing or education of their husband missing.

Model

I use logistic regression models to predict the labor force participation of these married women with young children. The first model includes a trend indicator (a dummy variable for calendar year) for the labor force participation controlling for these factors that prior research believed to affect female labor force participation:

$$\log\left(\frac{p}{1-p}\right) = b_0 + b_1 \cdot Year + b_2 \cdot X_{Normative} + b_3 \cdot X_{FamLC} + b_4 \cdot X_{HumanCap}$$

I then add interactions of the potential explanatory factors and the trend indicator and examine how the coefficient for trends in labor force participation b_1 changes along with these interaction effects.

$$\log\left(\frac{p}{1-p}\right) = b_0 + b_1 \cdot Year + b_2 \cdot X_{Normative} + b_3 \cdot X_{FamLC} + b_4 \cdot X_{HumanCap} + b_5 \cdot X_{Normative} \times Year + b_6 \cdot X_{FamLC} \times Year + b_7 \cdot X_{HumanCap} \times Year$$

If, by adding these interaction terms, the trend indicator b_1 reduces while the interaction terms b_5's to b_7's are statistically significant, I interpret the results as in support of the claim that changes in these factors help explain changes in the labor force participation of married women with young children.

Results

The descriptive statistics are shown in Table 1. The trends of these potential factors (as measured by the above explanatory variables) to explain changes in the labor force participation of married women with young children between 1983 and

2006 are largely in the same direction as prior theory would lead us to expect. For example, married women had an average of 2.1 children in 1983, but only 1.7 children in 2006. Because the demand for rearing a child and the demand for work often compete for the limited time and energy a woman has, women with fewer children are expected to be more likely to participate in the labor market. Similarly, the average age of married women increased from 26.5 to 30.3 years old between the two survey years. Mothers in 2006 had more work experiences and thus higher potential earnings than their counterparts in 1983, which is likely to increase their labor force participation. However, the average age of these women's husbands also rose from 30 to 33.5 years old in this period. As husbands in 2006 also tended to have higher earnings than husbands in 1983, this trend might have led to decreased labor force participation of these mothers with young children.

Table 2 presents the results of the logistic regression model predicting married women's labor force participation. Model 1 includes main effects only, and Model 2 adds interactions of the explanatory variables with the trend indicator of Calendar Year. In Model 1, the coefficient for the dummy variable of Calendar Year clearly indicates that the labor force participation rate for these women was higher in 2006 than in 1983. Married women with young children in 2006 had a 80% ($=e^{0.587}-1$) higher chance to participate in the labor force than their counterparts in 1983.

The number of children has no significant effect on married women's labor force

participation. The younger the children were, the less likely a married woman participated in the labor force. Married women with higher education, older age, and higher expected earnings were more likely to participate in the labor force than those with lower education, younger age, and lower expected earnings.

Husbands' educational levels have a positive effect on married women's labor force participation, which is consistent with the normative perspective. On the contrary, the ages of married women's husbands have a negative effect on women's labor force participation, but the effect is only marginally significant.

Adding the interactions of these explanatory variables with the trend indicator of Calendar Year into Model reduces the magnitude of the coefficient for Calendar Year (b = -0.2346) to flip sign and no longer statistically different from zero. This suggests that the changes in these explanatory variables explain changes in the trends in the labor force participation of married women with young children in the period between 1983 and 2006.

The interaction effects of almost all the explanatory variables are not statistically different from zero. These null findings suggest that the impacts of these explanatory variables on the labor force participation rates for married women with young children had not changed over this period. The notable exception is that the effect of married woman's years of schooling on her labor force participation had increased in this 23-year period (b = 0.1455, $p < .01$). Hence, I interpret the results

as consistent with the hypothesis that the educational expansion during this period, which led to changes in women's normative expectations regarding work and family, was able to explain the trends in labor force participation among married women with young children.

Conclusion

In this paper, I use the Women's Marriage, Fertility and Employment Survey to examine what factors contribute to the change in women's labor force participation in Taiwan between 1983 and 2006. I find that women's education is a strong predictor of their labor force participation, and the effect has increased over the 23-year period under study. None of the other factors, such as the expected earnings and the number and ages of children, changed their impacts on the labor force participation of married women with young children during this period. Therefore, the results reported in this paper support neither the human capital perspective nor the family cycle perspective. Rather, they are consistent with the normative perspective: highly educated women, compared with women with lower education, tended to have less traditional gender role orientations, and thus had a greater propensity to work than to sacrifice their career for family responsibilities such as childbearing and childrearing.

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Table 1. Descriptive Statistics (Means and Standard Deviations)

	Sample Mean	Sample S.D	1983 Mean	2006 Mean	Difference between 1983 Mean and 2006 Mean
Labor Force Participation	0.380	0.486	0.300	0.596	-0.296
Number of Children	2.014	1.045	2.127	1.711	0.416
Age of Youngest Child	20.113	8.639	20.259	19.721	0.538
Mother's age	27.511	4.512	26.481	30.255	-3.774
Father's age	30.964	5.682	30.042	33.510	-3.468
Mother's schooling	9.796	3.610	8.652	12.843	-4.191
Father's schooling	10.575	3.597	9.664	13.090	-3.425
Mother's earning (log)	12.450	1.381	12.232	13.033	-0.801

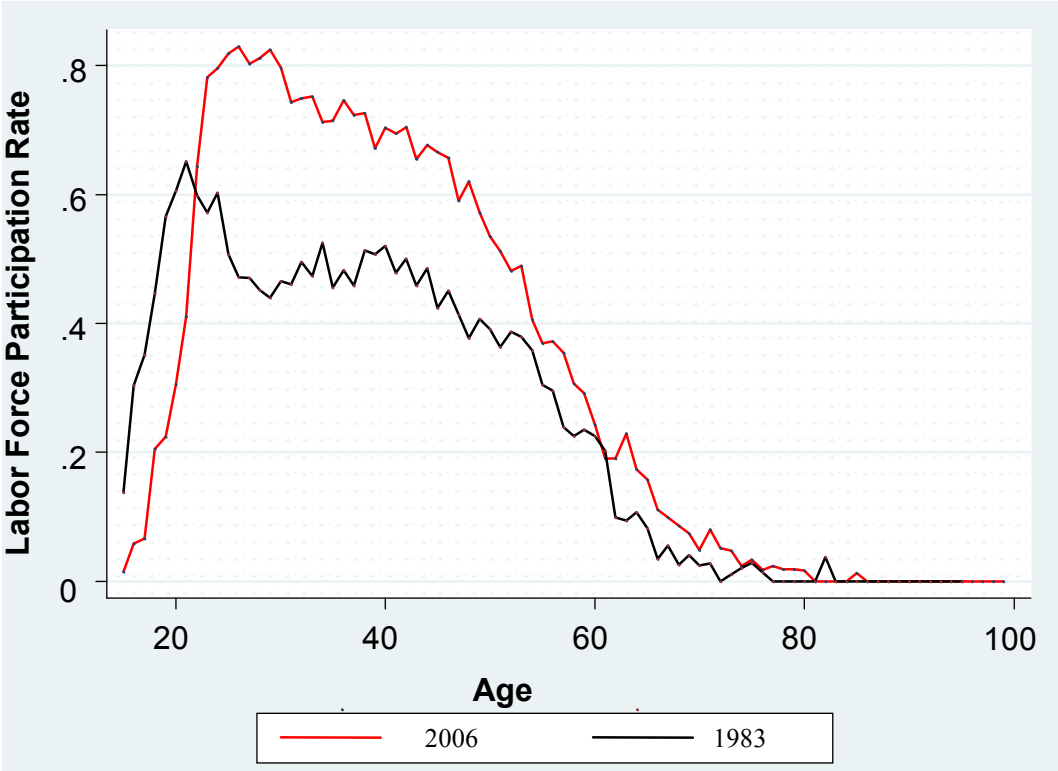
Table 2. Coefficient Estimates of Logistic Regressions Predicting Labor Force Participation for Married Women with Young Children.

	Model 1	**Model 2**	
Variables	Main Effects only	Main Effects	Interactions with Calendar Year
Number of Children			
1	---	---	---
2	-0.0731	-0.0353	-0.1040
3 or more	-0.0734	-0.0865	-0.1278
Age of Children			
0 - 6 month(s)	-0.5065 ***	-0.4299	-0.3474
7 – 12 months	-0.3498 ***	-0.2845 **	-0.3117
13 - 18 months	-0.3741 ***	-0.3162 **	-0.2749
19 - 24 months	-0.3138 **	-0.2667 *	-0.2377
25 - 30 months	-0.2257 *	-0.0688	-0.6550 **
31 - 36 months	-0.1640	-0.1132	-0.2632
37 months and above	---	---	---
Mother's schooling	0.1104 ***	0.0836 ***	0.1455 ***
Mother's age	0.0521 ***	0.0580 ***	-0.0223
Father's schooling	0.0474 ***	0.0511 ***	-0.0158
Father's age	-0.0153 *	-0.0056	-0.0260
Father missing	0.2440	0.2582	-0.1428
Mother's earnings (log)	-0.0747 ***	-0.0817 ***	0.0927
Calendar Year	0.5870 ***	-0.2346	
Intercept	-1.9511 ***	-2.2067 ***	

***P<0.01 ; ** P<0.05 ; * P<0.10

Source: The Women's Marriage, Fertility, and Employment Survey

Figure 1. Age Specific Percentages of Women in the Labor Force, 1983 and 2006



Source: The Women's Marriage, Fertility, and Employment Survey