Part-time participation among married women who work in the market

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Abstract

This paper explores how age influences the married women's decision to choose part-time jobs. For marred women, especially young married women with significant household responsibilities, part-time employment provides an important way for joining in the labor market and pursuing career and occupational goals. The empirical results show that the number of children, the presence of children under six years old and the husband's wage rate increase the married woman's decision to work part-time.

I   Introduction

Female labor force participation rates increased fivefold between 1900 and 1940 in the United States. Even though there is a declines in participation rates of women less than 35 years of age between 1940 and 1960, participation rates increased by another 50 percent between 1950 and 1970. The growth of female participation rates has continually increased but increase with decreasing rate since 1980s. And there is a similar trend of married women's participation rate. In 1960, there are only 6% of women with husbands present were working. By the middle of the 1970s about 40% of women with husbands and about 50% of mothers with children under the age of six were working. In the 1980s, there is a sharp rise in married women's labor supply. Since 1990, there is only a small increase in the married women's labor supply. And a lot of studies focus on the married women's decision to participate in the labor force since the changes in labor supply behavior of married women have related to the changes in labor supply for whole women.

Compared to men, women are more likely to be voluntarily working part time. With the increase of the part-time employment, some economists have considered the decision by some married women to work part-time. Part-time employment is defined as working fewer than 1600 hours per year. In 1993, nearly 20 percent of the labor

force worked for part-time. And the proportion of women who work part-time is always more than that of men. Among the studies distinguishing between part- and full time employment by married women, a majority conclude that women with preschool children tend to work part-time. And the husband's employment situation and income also play an important part on married woman's decision to work. Except for the reduced hours of labor supplied by part-time workers, part-time employment seems concentrated among unskilled occupations providing some kind of training. Blank (1990) explores trends in part-time employment with an examination of who works part-time in what types of jobs. She finds that nearly 50 percent of all part-time workers are women with young children and have marital status. And the number and age of children, and husband's income affect a woman's decision to work part-time. She also finds that part-time employment among women is rarely used as a bridge between nonemployment and full time work. But Williams (1995) finds that the decline in women's part-time employment from 1980 to 1989 is not due to an increase in the percentage of unemployed women finding full-time jobs. Rather, it is due to an increase in the percentage of women moving from part-time to full-time jobs as well as a decline in the percentage of women leaving full-time positions. And Miller (1997) finds evidence that the nature of part-time jobs has changed for the years 1976 and 1986. She concludes that part-time work may offer women a greater opportunity for the maintenance and accumulation of human capital. It implies that age may also play an important role in married woman's decision to work part-time since the young married women are more likely to invest in education than older married women and choose part-time jobs. With the same number of children and the presence of children under the age of six, the younger married women are also more likely to choose part-time jobs then older married women. The older married women may more likely to transfer from full-time to part-time jobs since they are more prefer to share the time with their family. With the development of the society, it is interesting to analyze how the age influences the married woman's choice of working part-time. But few studies analyze the role of age in married women's decision to work part-time. In this paper, I try to explore how age influences the married women's decision to choose part-time

jobs.

The second section discusses the data and presents the descriptive statistics. The third section discusses the model used in estimating the probability of working part-time. The empirical results are discussed in the fourth section and summary is presented in the fifth section.

II Data

The data set comes from the Panel Study of Income Dynamics (PSID). PSID, begun in 1968, is a longitudinal study of a representative sample of U.S. individuals (men, women, and children) and the family units in which they reside. It emphasizes the dynamic aspects of economic and demographic behavior, but its content is broad, including sociological and psychological measures. The PSID sample is consisted of two independent samples: a cross-sectional national sample and a national sample of low-income families. The cross-sectional sample was drawn by the Survey Research Center (SRC). Commonly called the SRC sample, it was a random sample of households from the 48 contiguous states and was designated to yield about 3,000 completed interviews. The second sample came from the Survey of Economic Opportunity (SEO), conducted by the Bureau of the Census for the Office of Economic Opportunity. In the mid-1960's, the PSID selected about 2,000 low-income families with heads under the age of sixty from SEO respondents. The sample, known as the SEO sample, was confined to Standard Metropolitan Statistical Areas (SMSA's) in the North and non-SMSA's in the Southern region. The PSID core sample combines the SRC and SEO samples.

Data for individual observations is obtained from the random national sample of 1999 which provides the interview information of preceding year, 1998. The sample consists of 11907 married women between 18 and 65 years of age in 1998 who have completed their education. Among these 11907 married women, 27 percent

were out of the labor force, 27 percent were employed part-time, and 46 percent were employed full-time. Those who were self-employed, in the armed forces, or students are excluded from the sample. To reduce the factors influencing part-time employment, women with poor health conditions are also excluded from the sample. Based on the age, married women in the sample are divided into three groups: young married women (18 to 25 years old), middle age married women (25 to 44 years old) and old married women (44 to 65 years old). Part-time employment is defined as working less than 1600 hours per year.

To see how the part-time and full-time jobs are distributed in the different occupations, the percentage of part-time and full-time workers for the different occupations in the sample were computed. From Table 1, we can find that the percentage of part-timers in the occupations such as management, administration and professional and technical jobs are relatively lower than it in the occupations such as farming, farm management, sales and services. Especially for the farm laborers and farm management, the percentage of part-time workers is more than 6 times greater than full-time workers, 85.5 percent versus 145 percent. However, the percentage of full-time workers in managerial and administrative jobs is about 4 times greater than part-time workers, 81.4 percent versus 18.5 percent. It convinced again that, for some occupations, there are great differences in the distribution of part-time and full-time. Table 1 also provides the information of the percentage of the college degree or above and percentage of 12 grades and below for the part-timers and full-timers respectively. It shows that the education level is almost identical among the part-timers and full-timers. But there are notable differences when some occupations are concerned. The percentage of the college degree or above is almost zero in farming and farm management which have a relatively high percentage of part-timers, while occupations such as crafts with relatively high percentage of full-timers also has a relatively low percentage of the college degree or above----only 7.03% of workers have college or above. Similar with crafts, professional/technical jobs have relatively high percentage of full-time workers, 62.4 percent. But the percentage of the college

degree or above in professional/technical occupations is high, 57.1 percent. It implies that the characteristics of jobs determine the required education level. The education level may be the factor that influences the decision of part-time and full-time but not the crucial one.

Summarized information of the sample is presented in Table 2. From Table 2, it shows that the probability of being out of the labor force is highest for old married women (35.67 percent) and lowest for young married women (18.06 percent). However, young married women have the highest probability of working part-time (38.76 percent). And opposite to my expectation, old married women have the lowest probability of working part-time (21.78 percent). The reason of it maybe more and more old married women choose to out of labor force with the increase of the age instead of transiting from full-time jobs to part-time jobs. Middle married women have the highest probability of working full-time (50.52 percent).   And the average year education is highest for full-timers and lowest for nonparticipant as expected, about 18.19 and 16.63 respectively. The number of children, especially the presence of children under six years old seems play an important role in a married woman's labor market choice. The average number of children is lowest for full-timers which is about 0.7 time of the nonparticipant. And the probability of no children is also highest for full-timers (about 40 percent)--1.6 times greater than the part-timers. Moving from nonparticipants to part-timers to full-timers, the percentage of presence of children under six years old decreases. The husband wage rates are also likely to affect wife's labor market decision. The wage rate of husbands is lowest for the full-timers and highest for part-timers. Within the sample, white married women are relatively easier to find jobs than black married women. Among part-timers, 70.81 percent are white married women and only 17.41 percent are black married women. The percentages of nonparticipants, part-timers and full-timers are different in different locations. Compared to other locations, the percentage of full-timers is highest in south and lowest in west. And the percentage of part-timers is highest in northeast and lowest in south. Table 3 presents average wage rate of married women in different locations.

The wage rates of both part-time and full-time are highest in the northeast. South has the lowest of full-time wage rate and north central has the lowest of part-time wage rate. Except for the south of United States, the wage rate of full-time is higher than the part-time. It is interesting that, at the same time, the percentage of part-timers is lowest in the south. Maybe the characteristics of part-time jobs in the south are different from other places.

III Model

In this paper, the probit is applied to analyze how age affects the married women's decision to choose part-time jobs. The interesting problem of the part-time and full-time's decision is whether it is corrected with characteristics of jobs and individuals. The distributions of part-time and full-time are different in different occupations which imply that people in some occupations have a relatively higher probability of being constrained to work part-time since their employers need more part-time workers. The characteristics of part-timers may also be different from the characteristics of full-timers, especially in their personal characteristics such as the taste of work. It means that workers may sort themselves solely on their preferences and their skills. Comparisons of the wages of part-timers with the wages of full-timers result in a biased estimate of the effect of random "treatment" of characteristics of jobs and individuals. So including the difference of natural logarithm of the hourly wage rate between part-timers and full-timers in the traditional probit regression may lead to a sample selection bias. The usual correction is the method provided by Heckman (1979).

First, setting up two wage equation, it is assumed that there are only two distinct groups of married women: part-time married women (measured as less than 1600 hours worked annually) and full-time married women.

$$\ln wage_{Fi} = X'_i \beta_F + \varepsilon_{Fi} \qquad (1)$$

$$\ln wage_{Pi} = X'_i \beta_P + \varepsilon_{Pi} \qquad\qquad (2)$$

Where $\ln wage_{Fi}$ and $\ln wage_{Pi}$ are the natural logarithm of the hourly wage rate of part-time married women and full-time married women and X_i are the independent variables that are assumed to affect wage determination which include age of wife, education level of wife, education level of wife's father, education level of wife's mother, working experience of wife, and white, south, west, north central dummy variables.

Next, probit regression is set up to estimate the probability of a married woman's labor market choice. Binary dependent variable (Y) is equal to one if married women work part-time and zero for full-timers.

$$Y_i = \beta_0 + \delta\ middle + \gamma\ older + \beta_1 wifeedu + \beta_2 wifefathedu + \beta_3 wifemothedu + \beta_4 numchild$$
$$+ \beta_5 childage6 + \beta_6 hushwage + \beta_7 husedu + south + white + farm + domestic$$
$$+ (\ln wage_{Fi} - \ln wage_{Pi})\theta + v_i$$

where the independent variables include education level of wife, education level of husband, education level of wife's father, education level of wife's mother, number of child, hourly wage rate of husband, middle age married women, old married women, the presence of children under six year old, white, south, farm and domestic dummy variables and the difference of natural logarithm of the hourly wage rate of part-time married women and full-timers. To simplify the above probit regression, it is rewritten as:

$$Y_i = Z_i'\alpha + (\ln wage_{Fi} - \ln wage_{Pi})\theta + v_i \qquad\qquad (3)$$

From equation the maximum likelihood probit estimation, the inverse of Mill's ratio (λ_i) can be estimated as follows:

$$\lambda_F = -f(\hat{Y})/F(\hat{Y}) \qquad\qquad (4)$$

$$\lambda_P = -f(\hat{Y})/[1 - F(\hat{Y})] \qquad (5)$$

F is cumulative distribution of a standard normal and f is the related density function. Once λ_F and λ_P are estimated, they are included into equation (1) and (2) to correct sample-selection.

$$\ln wage_{Fi} = X_i'\beta_F + \kappa_F\lambda_F + \varepsilon_{Fi} \qquad (6)$$

$$\ln wage_{Pi} = X_i'\beta_P + \kappa_P\lambda_P + \varepsilon_{Pi} \qquad (7)$$

With equation (3), (6) and (7), the coefficient α can be estimated.

IV Result

Two sets of empirical results are provided in this section. The first set of results is generated from traditional probit regression model. The sample only consists of working married women. And young married woman is chosen as the base model.

$$Y_i = \beta_0 + \delta \ middle + \gamma \ older + \beta_1 wifeedu + \beta_2 wifefathedu + \beta_3 wifemothedu + \beta_4 numchild$$
$$+ \beta_5 childage6 + \beta_6 hushwage + \beta_7 husedu + south + white + farm + domestic + v_i$$

Table 4 presents parameter estimates of the traditional probit regression. The negative coefficients of middle married women and old married women are consistent with the results of descriptive statistics of the data and significant at 1%. It shows that, for married women, the probability of choosing part-time jobs decreases with the increase of age. The coefficient of wife education level is negative but insignificant. The coefficient on husband's hourly wage rate is positive and significant as expected which verify the hypothesis that husband's wage rate is an increasing function of married women's choosing to work part-time. The positive sign of number of child, the presence of children less than six years of age, farm and domestic imply that these factors increase the married women's decision of choosing part-time jobs.

The second set of results is generated from the Heckman model which corrects the sample-selection issue. And results are presented in Table 5. Compared to the results in table 4, all parameters' coefficients display the same sign of the traditional probit model. But the coefficient of wife's education level becomes more insignificant which implies that wife's education level doesn't play an important role in a married woman's choice of working part-time. From the table 5, we can find that the effect of age on part-time working choice increases and robust. The influence of husband's wage rate on wife's part-time choice also increases. Even though the effects of number of child and the presence of children under six years old decline, the estimators of these two variables are still significant. At the same time, the coefficients of south and white are insignificant.

V   Summary

For married women, especially young married women with significant household responsibilities---rearing children, part-time employment provides an important way for joining in the labor market and pursuing career and occupational goals. The opportunity to work part-time enables young married women to contribute to household income while engaged in the responsibilities of family life. The empirical results show that the number of children, the presence of children under six years old and the husband's wage rate increase the married woman's decision to work part-time. And the role of education level on part-time decision is not important as we thought. If the part-time employment is voluntary, it is an efficient means for married women to meet constraints placed on their time.

Table 1

The occupation	the percentage of part-time	the percentage of full-time	the percentage of college degree and above	the percentage of 12 grades and below
Farmers and Farm Managers	86.67%	13.33%	0%	53.33%
Farm Laborers and Farm Foremen	85.47%	14.53%	0%	88.23%
Private Household Workers(Domestic)	75.68%	24.32%	5.80%	66.67%
Transport Equipment Operatives	48.41%	51.59%	4.60%	79.63%
Sales Workers (Sales)	45.91%	54.09%	26.38%	45.08%
Service Workers, Except Private Household	45.57%	54.43%	5.50%	73.80%
Laborers, Except Farm	40.82%	59.18%	7.00%	69.57%
Operatives, Except Transport (Operative)	38.63%	61.37%	2.30%	86.20%
Professional, Technical, and Kindred Workers	37.61%	62.39%	57.08%	17.57%
Clerical and Kindred Workers (Clerical)	35.93%	64.07%	13.01%	49.07%
Craftsmen and Kindred Workers (Crafts)	27.67%	72.33%	7.30%	56.70%
Managers and Administrators, Except Farm	18.55%	81.45%	31.37%	34.66%

Table 2

Summary: Married Women

Variables	Nonparticipant	Part-Time	Full-Time
18 to 24 years old	18.06%	38.76%	43.18%
25 to 44 years old	20.69%	28.79%	50.52%
45 to 66 years old	35.67%	21.78%	42.55%
Average Years Education	16.63	17.08	18.19
Number of children	1.84	1.82	1.4
Children<6 years old	66.63%	55.46%	43.79%
no children	33.27%	23.81%	39.94%
Average hourly earnings of wife	--	14.42	14.16
Average hourly earnings of husband	19.73	21.16	18.76
Race: White	58.69%	70.81%	62.66%
Race: Black	21.17%	17.41%	28.60%
Northeast	32.82%	30.52%	36.66%
North central	30.98%	25.31%	43.71%
South	31.73%	22.04%	46.23%
West	40.86%	27.79%	31.35%

Table 3

Average hourly earnings of wife	Part-Time	Full-Time
Northeast	16.66	17.28
North Central	13.12	13.34
South	14.20	13.14
West	13.18	15.38

Table 4

Probit Model Results

Variables (part-time)	Coefficient	Standard Error	P-Value
Middle age Married Women	-0.4088957	0.0690794	0.000
old Married Women	-0.324672	0.0744054	0.000
Wife's education level	-0.0136182	0.0104873	0.149
Husband's education level	0.0397569	0.0095618	0.000
Wife father's education level	0.0129499	0.0125738	0.303
Wife mother's education level	-0.004179	0.0144634	0.773
Number of children	0.238546	0.0162806	0.000
presence of children <6 years old	0.3059579	0.0380013	0.000
Variables (part-time)	**Coefficient**	**Standard Error**	**P-Value**
south	-0.1760388	0.0382023	0.000
husband's hourly wage rate	0.0074175	0.0010701	0.000
farm	1.458305	0.3789394	0.000
domestic	1.259847	0.323927	0.000
white	0.3465809	0.0465057	0.000
constant	-1.277073	0.1503164	0.000

Table 5

Heckman Model Results

Variables (part-time)	Coefficient	Standard Error	P-Value
Middle age Married Women	-0.5999021	0.1150432	0.000
old Married Women	-0.8183346	0.1808716	0.000
Wife's education level	-0.0287614	0.0265057	0.278
Husband's education level	0.003963	0.0228826	0.863
Wife father's education level	-0.0240229	0.0318757	0.451
Wife mother's education level	0.0622393	0.0389254	0.110
Number of children	0.2009269	0.0429903	0.000
presence of children <6 years old	0.2656835	0.1205902	0.028
south	-0.1435482	0.094884	0.130
husband's hourly wage rate	0.0211487	0.005078	0.000
white	0.1140869	0.108039	0.291
constant	-0.5524708	0.4135479	0.182

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