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Married Women Labor Supply Decision in Malaysia

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Abstract

In modern living, the participation of female in the labor market is becoming essential for development economy. The higher educational attainment among females makes it easier for them to find jobs and to be involved in the labor market. Nevertheless, the participation of women in the labor market is less prevalent than for men, especially for married women, where family responsibilities and household chores become obstacles for them. This paper attempts to identify the determinants of married women's participation in the labor market based on 3,520 data collected in 2011 through a field survey. The results from this study show that educational attainment, women's age and number of children are major determinants of the supply of married women labor. In contrast, husbands' wage and own wage are insignificantly determined the supply of married women labor in this study.

Keywords: married women, female labor supply, educational attainment, children

1. Introduction

In modern living, the participation of female in the labor market is becoming more important for development economy, especially for a fast growing country. The robustness of the female labor force will promote economic development, which, in turn, will change the labor market conditions. The studies on the supply of female labor have been done by many researchers (Blundell, Ham & Meghir, 1987; Arellano & Meghir, 1992; Nakamura & Nakamura, 1994; Eissa & Liebman, 1996; Greenwood et al., 2005). In many countries, especially the developing economies, the participation of female employment has increased, in terms of quantity and job categories. This change shows a transition in the labor market structure, which indicates transformation in the composition and the participation rate of female labor. The larger participation rate by women in the labor workforce of economic sectors is a result of improvement in their educational level of attainment, whereby their involvement at the professional level has significantly increased.

As the participation rate of female labor attribute to several reasons, an investigation of determinants of female labor supply is actually essential, as they are important for policy design and the further benefits of females. In particular, we need to understand how female labor responds to the market wage, as wages will determine their family wellbeing, especially for a single parent. In the studies of labor supply, education has positively affected the possibility of female labor to enter the job market. The substantial effect of larger supply of female labor is on the dynamic ratio between average earnings of female and male. The results from several studies indicated that in 1960s and 1970s, a larger entrance of female labor with low skills and lack of working experience lead to deterioration in the labor quality, and, hence, lower labor productivity (Smith & Ward, 1989; Goldin, 1989; 1990; O'Neil & Polachek, 1993). This resulted an increase in the ratio of average earnings is remained constant during the two decades.

The choice of females to take part in the labor workforce is usually dominated by the household-decision process. In other words, the decision of whether woman work or not work, especially those who are married will be decided by the members of the household, particularly by adult males. Although working woman will generate income to the family as it will support expenditures increased and benefits of the household, working outside is actually led to a lesser time-spending with children and a household-chore. This will reduce a household-benefit. Thus, the decision of woman whether work or stay at home is determined by the collective utility of the household and the market wage is only as an economic incentive. Apart from that, the rate of participation among females to enter the labor market workforce is always influenced by several main factors. These are the

presence of young children or children with disabilities, technology enhancement and discrimination of gender.

Few studies have observed the relationships between the supply of female labor and the process of decision by the household (Francois, 1998; Basu, 2006; Atal, 2010). Study by Atal (2010) discovered that the participation of female in labor workforce is decided by the household and the distribution of power is formed endogenously among the household members. The supply of female labor explains that the contribution of women income to their families will determine the distribution of power. The more she gains, the more her power increases in the household as meaning to say that she has more freedom to do an outside job.

In Malaysia, even though the participation of female labor in all economic sectors is increasing over years, their rate of participation is still low. The statistics show that the participation of female employment has not changed significantly over the last three decades and it remains at a range from 44 to 48 % yearly. In terms of age group, the rate has decreased significantly for the group of 35-44 years. The participation of female in employment has decreased from 58 to 50 % for the group of 45-54 years and yet decreased to only 25 % for the group of 55-64 years (DOS, 2011).The female employment is relatively below than 50 % out of the total employment.

Based on the discussions above, this paper attempts to examine the factors that determine supply of married women labor in Malaysia. This paper is formed as follows: Section two, discusses the literature of the past studies pertaining determinants of the female labor supply. Section three, outlines the methodology, which describes data collection, measures, variables, model specification, and descriptive statistics of the study. Section four, provides the results of the study by discussing factors in determining the supply of married women labor in Malaysia. Finally, the last section provides the summary and conclusion.

2. Literature Review

In general literature, education has a strong correlation with the economic growth, which, in turn, it will affect the pattern of supply in the labor market. The positive outcomes of education on the supply of labor market are obtained by many studies. For instance, an increase in level of educational attainment has positively affects an increase in labor supply in rural farm in Ghana and in agricultural sector in Sudan (Jolliffe, 2004; Babikir & Babiker, 2007). More specifically, it has increased female labor supply of an urban labor markets in Sudan (Maglad, 1998). These findings of the studies actually supports the theory of human capital that the relationship between education and labor supply is highly correlated, which is, higher educational level is positively correlated with a higher potential of income earnings.

Previous studies have examined the factors that determine the supply of women labor. Most of the findings of female labor supply studies are supported by the theory of female labor supply, particularly the decision of whether to work or stay at home. By hypothesizing the value of time, the participation of female to work is positively correlated with the value qualities of a marriage. If the women have high value qualities in their marriage, their possibility to work is lesser (Grossbard-Shechtman & Neuman, 1988).

In a recent study by Hazan and Maoz (2010) on the women choice to work shows that the pattern of workforce is extensive among the women in the United States in the 1960s and 1970s. During the periods, the women choose to join the labor workforce at an early stage of their life although the wage is sufficiently low. Most of studies on the female labor supply analyses females' characteristics especially when dealing with the house-task. The studies identified that great relationship occurs between supply of female labor and the size of the families, including age of the children. Furthermore, the husbands' characteristics, as well as their educational attainment and returns, will also influence the supply of female labor. However, it is different for unmarried female, educational attainment and wage rate are the more important characteristics in determining their labor supply. The similar study also observes employment of married women and the reason of married women to joint in the labor workforce is still unspecified, except obtained the result of wives' hours of work is relatively limited (Olivier, 2005).

As for traditional role of gender, woman is observed as supporting in terms of income to the family and particularly, their participation in the workforce has an adverse impact with their spouse's wages. Study by Saget (1999) indicates two prominent results. First, elasticity of wage of married woman is approximated to be positive. Second, husband's income (as he is head of the household) is not significant and has an adverse impact with the probability of female labor supply. This indicates that the supply of Hungarian female labor is not determined by income of their husband and the household. However, this result contrasts with result of the Canadian wives supply which highly related to the change in their husbands' wages during the 1980s (Morissette & Hou, 2008).

As the increased in female employment is due to increase in their educational attainment, the study found that 33 percent of an increase in female employees is contributed by education, while another 40 percent is observed by

the households' characteristics and the remaining percentage is unexplained factors (Eckstein & Lifshitz, 2009).The study further extended that the unexplained factors is attributed to the preferences of working or to face the costs of childcare and households expenses. In the particular study, the work behavior of women largely depends on their wages and their husband's wages, and, the elasticity of the labor market supply (Gomez & Vazquez, 2010). Moreover, the elasticity of female labor supply had a rather sharp decrease between 1990 and 2000, which representing women are increasingly attached to the labor market.

Another study was developed a model of female labor supply by taking into account the factor of inter-temporal. Concerning to this analysis, under uncertainty labor will optimize their job search activity as well (Arellano & Meghir, 1992). This contrast from many previous studies that disregard the factor of inter-temporal in the model of supply female labor (Heckman, 1974; Hausman, 1980; Heckman & MaCurdy, 1980; Cogan, 1981; Blundell & Walker, 1986; Altonji, 1986). Furthermore, the participation of female labor has been in S-shaped, in which, slow at the first stage, fast in the second stage, and finally, stable due to the women with young children decide to work.

The recent circumstance of participation among female to joint in the workforce is based on the justification that competency is relatively important among the women and spending time with children is also essential for the children futures (Fogli & Veldkamp, 2008). The study was extended to investigate the process of the transition of women into the workforce. The benefit of maternity will improved as employment of married women increased. Thus, the rate of participation rise faster and overall growth of participation rates is also increased.

The importance of structure of the family on the supply of female labor is also taken into consideration (Newman & Gertler, 1994). The structure of the family is found positively correlated to the household income and female labor supply in Peru. Several studies have shown that the age of children is significantly influenced the supply of married women labor (Gronau, 1973; Rosenzweig & Wolpin, 1980; Schultz, 1990). From the study, the effect on the supply of female labor is negative and it is actually larger for children at the younger age (below 6 years old) and an adverse result can be seen for children at the older age (above 12 years old) (Augrist & Evans, 1996).

Based on the results from past studies, most researches agreed that the working hours of mother will reduce as they have children, whereas it is insignificant for father. This is similar with the results obtained for Malaysia, that show the children below age of 6 years old and children in the schooling age is also reduced hours of work of married women in the sub sector of handicraft (Rahmah & Fatimah, 1999). Another study pertaining to Malaysia shows the effect of wives' incomes on the household income disparity in Peninsular Malaysia from period 1976 to 1988. The study reveals that the wives' incomes assist to reduce income disparity among the households in Malaysia (Shahina & Julie, 2004).

Another factor decreases hours of work by female labor is due to the health constraints and care commitments. Among an elderly American worker who resigned from 1992 to 2000, 13% respond that they will stay working if they can reduce their working hours (Penner et al., 2002). Similarly, about 7% of workers in Sweden in age 50 and above claimed that by shortening hours of work they may continue their present job until the age of official retirement. This because by shortening hours of work they would overcomes physical and health problem (Wadensjo, 2008).

In general, the rate of female labor participation has increased since after the Second World-War II as women reduced in having child (Coleman & Pencavel, 1993; Schultz, 1978; Rosenzweig & Wolpin, 1980). The results from the study in Mexico (Wong & Levine, 1992) and in the United States (Tienda & Glass, 1985) also support the findings of an expansion in female labor participation will lower the number of children in the families. More specifically, if the opportunity of women in aged 21 to 35 years in getting at least two child reduced by 18%, this will increase female labor force participation rate by 21% (Augrist & Evans, 1996).

3. Theoretical Framework, Methodology and Model Specification

The decision to work among females is very much dependent on their dual role and the allocation of times between these two tasks. A woman can choose between working at home to do household production, such as taking care of the children; doing household chores, such as cooking or washing; or she can choose to do market work by offering her services in the labor market to get paid, which can be used for buying goods and services. A labor supply model for married females assumes that the female still lives with her husband, has at least one child and she is the best person to look after her child. Based on Ribar (1992), Connelly (1992), Michalopoulos et al. (1991), Powel (1997), Kimmel (1998), and Blau and Robins (1988), utility maximization can be written as follows:

$$U = U(X, L, Q) \tag{1}$$

Where, U is utility, X is consumption of goods and services, L is leisure time and Q is childcare quality. The

utility maximization of equation (1) is subjected to these three constraints:

$$HW + V = X + P_C T_C \tag{2}$$

$$H + T_M + L = 1 \tag{3}$$

$$T_M + T_C + 1 \tag{4}$$

Where, H is female hours of work, W is female wage rate, V is household non-labor income, P_c is child-bearing cost, T_C is time spent for child care, T_M is time spent for working in the market. Solving equation (1) subjects to three constraints will produce the equation below:

$$\frac{U_L}{U_X} = W = \frac{U_0}{U_X}(Q_1 - Q_2) = P_C \tag{5}$$

This equation shows that a woman will participate in the labor market when the rate of marginal substitution between leisure and goods is equal to the wage rate, hence equal to the net benefit from childcare services quality. Therefore, the female labor supply function can be written as:

$$H = h(W, P_C) \tag{6}$$

Other variables can be added into equation (6) to include female characteristics and other related variables. The general function is written as follows:

$$H = h(W, P_C, Zi) \tag{7}$$

In this paper, female labor supply is measured by a dummy variable as 1 if they are working and zero if they are not working. As the dependent variable is categorical, the logistic regression approach is used in the estimation.

In general, logistic regression is applied to evaluate the functional relationship between the dependent variables, which is qualitative and the independent variables, both quantitative and qualitative variables. The dependent variable with categorical is used, whereby, the value 1 denotes if a head of household is working and 0 denotes if a head of household is not working. Therefore, the model is estimated in logistic binomial form. The model used is as follows:

$$P_i = 1(1 + e^{-z}) \tag{8}$$

Where P_i is the probability of workers having been mobile ($Y = 1$). The probability to choose the other is ($Y = 0$) written as:

$$(1 - P_i) = 1/(1 + e^{-z}) \tag{9}$$

Therefore, the probability of a worker changing jobs is:

$$e^z = P_i/(1 - P_i) \tag{10}$$

The model is then transformed to a logarithm model to produce the equation:

$$z_i = \ln(P_i/(1 - P_i) = \text{lnezi} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + ... + \beta_n X_n \tag{11}$$

The estimation of the logistic model utilizes the likelihood ratio test (LRT) as an indicator for fitness of the model and the t-test for identifying the significant of the parameters. The estimation model for this study is as follows:

$$LS_i = \beta_0 + \beta_1 HW_i + \beta_2 FW_i + \beta_3 FEDU_i + \beta_4 FAGE_i + \beta_5 NLY_i + \beta_6 NUMC_i + \beta_7 GLOB_i + \mu_i \tag{12}$$

Where, LS is female labor supply status whether working or not working, HW is husband's monthly wage, FW is female's monthly wage, FEDU is female level of education, FAGE is female's age, NLY is family non-labor income. NUMC is the number of children and GLOB is female's perception on the effect of globalization on their work opportunities and i is individuals.

4. Source of Data

The analysis is based on the data collected from the field survey in 2011. The survey covered 4,000 households in Peninsular Malaysia, which were chosen using stratified random sampling; however, only 3,885 questionnaires were completed. The data included information on heads of households, spouses, families, background of education and background of employment. Since the main objective of this paper is to look at the married women labor supply decision, the wives' data are used in the analysis, which comprise 3,520 married women. The study only covers the states in Peninsular Malaysia due to constraints of time and finances. The total sample in each state is based on the following formula:

Sample in each state = $\frac{TotalPopulationineachstate}{TotalPopulationinMalaysia}$x 4000

Table 1. Population and sample

State	Population, 2010 (million)	Total Sample
Northern Region		
Kedah	2.04	355
Perak	2.44	425
Perlis	0.25	43
Pulau Pinang	1.6	279
Middle Region		
Melaka	0.79	138
Negeri Sembilan	1.03	179
Selangor	5.31	924
Wilayah Persekutuan Kuala Lumpur	1.7	296
Southern Region		
Johor	3.46	602
Eastern Region		
Kelantan	1.67	291
Pahang	1.57	273
Terengganu	1.12	195
Malaysia	**22.98**	**4000**

Table 2 presents the profiles of the respondents, which are categorized into seven components. The majority of respondents is aged less than 45 years old and holds secondary level of education. Their distribution in the public and private sectors is almost equal, and very few of them work in multinational corporations. Almost half of the respondents work as full-time workers and are involved in the services sector. Even though the majority of them have been working for more than 30 years, almost half receive a monthly wage of less than RM1000.

Table 2. Profile of respondents

Characteristics	Total	Percentage
Age		
<25	158	4.5
26-35	995	28.3
36-45	1138	32.3
46-55	1005	28.6
>56	224	6.3
Total	**3520**	**100.0**
Level of education		
Primary	406	11.5
Secondary	1794	51.0
Diploma/STPM	674	19.1
Degree	614	17.4
Others	32	0.9
Total	**3520**	**100.0**
Job sector		
Public	996	28.3
Private	759	21.6
Multinational	59	1.7
Others	1706	48.5
Total	**3520**	**100.0**
Job-status		
Full-time	1618	46.0
Part-time	66	1.9
Self-employed	134	3.8
Others	1702	48.4
Total	**3520**	**100.0**
Job in economic sector		
Services	1611	45.8
Manufacturing	151	4.3
Agriculture	48	1.4
Mining	1	0.0
Construction	10	0.3
Others	1699	48.3
Total	**3520**	**100.0**
Working experience		
<10 years	945	26.8
11-20 years	555	15.8
21-30 years	287	8.2
>30 years	1734	49.2
Total	**3520**	**100.0**
Total income		
<1000	1683	47.8
1001-2000	633	18.0
2001-3000	504	14.3
3001-4000	397	11.3
4001-5000	158	4.5
>5000	145	4.1
Total	**3520**	**100.0**

Source: Field Survey, 2011

Table 3 presents descriptive statistics of the variables used in the model of labor supply. The mean of monthly wage for the husbands is RM3275.96 and for wives is RM1985.75. The mean years of schooling for female are11.8 years, 51 percent received secondary education and 37 percent received tertiary education. On average, females are 41 years old and have about three children. Most females highly agreed with the effect of globalization on their participation in labor force.

Table 3. Descriptive statistics of variables

Variables	Mean	Standard deviation
Husband's wage (RM)	3 275.96	2 932.650
Own wage (RM)	1 985.75	1 901.984
Years of schooling	11.80	3.154
Secondary education	0.51	0.500
Tertiary education	0.37	0.482
Age	40.93	19.839
Non-labor income (RM)	171.56	58.649
Number of children	2.60	1.737
Perception on the effect of globalization	5.48	1.164

The results from the estimation of the logistic regression model are shown in Table 4. The R^2 is between 0.373 and 0.482, which implies that about 37.3% to 48.2% of the variation in the dependent variables can be explained by the independent variables. The results show that four variables significantly influence the decision of married women to work, namely, years of schooling, age, secondary level of education and tertiary level of education, as noted in Table 4. Years of schooling and age are found to have a positive impact on the decision of married women and are significant at 5%. The marginal effects show that a one-year increase in school years increases the possibility of being in the labor market by 13.5%. In contrast, an increase of one year in the age of the married women will reduce the probability of working by 4.3%. Married women with secondary and tertiary education are more likely to be working compared to those with primary education. The number of children also has a negative impact on the supply of married women labor by reducing the probability of being in the labor market by about 16.2% to 17.2% with the addition of one child.

Table 4. Logistic regression estimates

Variables	Level of education			Years of schooling		
	Coefficients	Exp (B)	Marginal effect	Coefficients	Exp (B)	Marginal effect
Constant	1.117	0.966	0.2319	-1.1329	0.000	0.2693
	(4.663)			(7.168)		
Husband's wage	0.001	1.000	0.000208	0.001	1.000	0.000238
	(0.000)			(0.00)		
Own Wage	0.001	0.036	0.000208	0.001	1.000	0.000238
	(0.000)			(0.000)		
Years of schooling				0.568	1.765	0.1350
				(0.230)**		
Secondary education	3.337	1.045	0.6928			
	(1.992)*					
Tertiary education	3.102	1.145	0.6439			
	(1.896)*					
Age	-0.135	1.000	-0.0280	-0.182	1.199	-0.0433
	(0.075)*			(0.080)**		
Non-labor income	0.0001	2.286	0.000021	0.0001	1.000	0.000024
	(0.000)			(0.000)		
Number of children	-0.827	0.917	-0.1718	-0.682	1.977	-0.1621
	(0.464)*			(0.495)		
Perception on the effect of globalization	-0.087	3.055	-0.0181	-0.186	0.831	-0.0442
	(0.492)			(0.230)		
Negelkerke R		0.373			0.482	
N		3520			3520	

Notes: Figures in parentheses are standard error. Marginal effect is calculated for logistic regression using the formula $\frac{\partial p}{\partial x_i} = f(\bar{Z})\hat{\beta}_i$ where $(\bar{Z}) = \frac{e^{-\bar{Z}}}{(1+e^{-\bar{Z}})^2}$. For the dummy variables, ∂x refers to discrete changes from 0 to 1.

*significant at 10%, **significant at 5%.

5. Conclusion

Women's participation in the labor market is constrained by many characteristics of the family due to their dual roles. The labor market theory proposes, that, in general, the labor supply is determined by own wage, spouse wage and non-labor income. However, this study shows that the important determinants are years of schooling and age. Years of schooling positively affect the supply of married women labor whereas age has an adverse effect. Wages, either own or husband's wage, is not proven to be significant from this study. The importance of education is supported by the more likely effect of women with secondary and tertiary education to be in the labor market compared to those with primary and no schooling.

The results from this study have several policy implications. Since wage is not a prime determinant of married women labor supply, but education is, women must attain higher education to gain benefit from the labor market. The number of children is another important obstacle for married women to be in the workforce, therefore childcare facilities must be provided in the workplace to assist women. As far as the Government is concerned,

women's participation in the workforce is most welcome to obtain benefit, especially those with higher level of education.

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