Globalisation and Labour Supply of Single Female Heads of Households in Malaysia

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Abstract: Globalisation is a process in which interlink between countries in the world has become more intense and the flow of inputs between one country to another is much easier. In the context of the labour market, the inflow of labor input from foreign countries is more relevant, because it has implications on the local labour, especially the females in terms of job opportunities. This paper attempts to investigate this issue using data from 261 single female headed households in Peninsular Malaysia. The household production model will be the basis for the analysis. In this model, the basic determinants for female labour supply are own wage and non-labour income. However, other variables like family size, children's age, household's characteristics and the globalisation indicators will also be incorporated as independent variables. The results show that monthly wage, non-labour income and number of children are significant and positively affect female labour supply, while foreign workers is significantly negative. **(**Rahmah Ismail, Poo Bee Tin**. Globalisation and Labour Supply of Single Female Heads of Households in Malaysia .** *Life Sci J* 2012;9(4):2750-2759] (ISSN:1097-8135). **http://www.lifesciencesite.com.** 405

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1. Introduction

Globalisation is a phenomenon that cannot be avoided. The world economy is moving towards global integration. The globalisation issue has already been long debated by researchers. Hoogvelt (1997) characterised globalisation as the increasing interdependency of world habitants in a system. This occurs through trade, ties and co-operation between countries, the existence of international organisations and the global awareness manifested through the exposure of the global community to unify communication through the compression of time and space. From the economic perspective, Globalisation can be viewed as the expansion of companies through national boundaries. Globalisation of trade linked with liberalisation in the trade policy has changed the way people work, think and consume, and reduces barriers to free trade. The negative impact of globalisation towards developing countries is the widespread effect of poverty, unemployment and the human resource development crisis.

A more comprehensive and detailed picture is given by Duncan (2000), who defined globalisation as the process of economic integration between countries, integration of traded goods and services and investment (both the fixed investment and investment portfolio). It can be summarised that globalisation is the distribution of global goods, services and capital including information and ideas. In this respect, globalisation opens the economy, and physically moves goods, services, capital, labour and technology. Economic globalisation is characterised by production, exchanges, distribution, and the consumption of goods and services. Through the globalisation process, the capital moves with ease between countries, as companies that manage production on a global scale can source for cheaper cost and higher profit margins across borders. This results in the expansion of global economic relations through international trade, investment, production, financial exchange, labour migration, organisational practices and international collaboration.

As globalisation allows the free flow of input, including labour, it may affect job opportunities for the locals, as they would face stiffer competition in securing jobs and may end up being unemployed, especially females who are less preferred by employers. This phenomenon may not be so critical for women if they have husbands to support their daily needs. However, for single females, being unemployed is a major problem, especially when they have children to support. In this respect, globalisation may become a threat to them in acquiring jobs or even obtaining good pay from the existing jobs. Therefore, examining the structure of single female labour supply is crucial in understanding household behaviour in the era of globalisation.

The objective of this article is to examine the labour supply of single female heads of households by taking into account the globalisation effect. The analysis will be based on the female headed households collected from the field survey in 2011. The study covers 3,885 households in Peninsular Malaysia, who were chosen using stratified random sampling. However, only 261 are single female headed households, which is the subject of analysis in this paper. The data include information on heads of household, their spouses, families, education

background and employment background. Since the main purpose of the study is to look at the impact of globalisation on the labour market structure, the data also cover questions on globalisation from the points of view of the respondents. This paper is organised into six sections. The preceding section contains the discussion on the trend of female labour supply in Malaysia, followed by the literature review. The next section discusses the theoretical framework and model specification, followed by the results and conclusion.

2. Trend of Female Labour Supply in Malaysia
　　　　Labour supply can be defined as the population aged between 15-64 years old working or seeking jobs in a particular period. There are various factors that determine the labour supply, such as birth rate, death rate, migration and labour force participation rate (LFPR). The most important determinant of labour supply is the LFPR, which is defined as the number of the labour force divided by the number of the population aged 15-64 years old.
　　　　Table 1 presents the LFPR for Malaysia for the period 1995-2010. It shows that the LFPR for the total economy declined from 64.8 per cent in 1995 to 62.7 per cent in 2010 and that the same pattern is shown for the male LFPR. The LFPR of the males is far higher than that of the females by almost double. The decline in the LFPR can be explained by the higher growth of the population within the working age compared with the number of the labour force, economic slowdown that affects job creation and high unemployment rate. The higher LFPR for males is expected since the dual role of the females could hinder them from being in the labour market even though they are educated or qualified. However, the female LFPR increased from 44.7 per cent in 1995 to 46.1 per cent in 2010. An increase in the female LFPR can be explained by the increase in the marrying age, a decline in the fertility rate, expansion in the economic development, improvement in the educational facilities and high cost of urban living. In addition, the positive attitude of parents and husbands towards women's

education also positively contributes to women's participation in the labour force.

Table 1: Labour Force Participation Rate by Sex, Malaysia 1995-2010

Year	Labour Force Participation Rate (LFRP)		
	Male	Female	Total
1995	84.3	44.7	64.8
2000	83.0	47.2	65.4
2005	80.0	45.9	63.3
2009	78.9	46.4	62.9
2010	78.7	46.1	62.7

Source: Department of Statistics Malaysia, The Labour Force Surveys various years.

　　　　Table 2 shows the percentage distribution of female labour force by sector. Three sectors that are dominated by the females in 2009 are the (i) manufacturing, (ii) wholesale and retail trade; repair of motor vehicle, motorcycles and personal and household goods, and (iii) education sector. The manufacturing sector plays an important role in contributing to female employment. The increase in job opportunities in the electrical and electronic industries, and other industries, such as garment, textiles and food processing, also labelled as industrial feminisation, have encouraged more women to work in the manufacturing sector. The participation of women in wholesale and retail trade; repair of motor vehicles and motorcycles, and personal and household goods sector is increasing over time, that is, from 14.6 per cent in 2002 to 16.6 per cent in 2010.
　　　　The education sector was the third highest contributor to female employment in 2010, where the participation of women increased from 9.1 per cent in 2002 to 12.1 per cent in 2009. It is often argued that the education sector is deemed suitable for women due to their domestic and so called feminine nature. However, the participation of women in the agricultural sector decreased from 11.5 per cent in 2002 to 8.9 per cent in 2009. The female LFPR in the agricultural sector has coincided with the amazing growth in the secondary and tertiary sector.

Table 2: Percentage Distribution of Female Labour Force by Sector, Malaysia2002- 2010

Sector	2002	2003	2004	2005	2006	2007	2008	2009
Agriculture, hunting and forestry	11.5	10.9	10.4	10.0	9.9	9.8	8.9	8.9
Fishing	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Mining and quarrying	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.2
Manufacturing	25.1	24.7	22.8	22.0	22.2	20.6	20.0	17.5
Electricity, gas and water supply	0.2	0.3	0.2	0.2	0.3	0.2	0.3	0.2
Construction	1.9	1.9	1.8	2.0	2.0	1.8	2.2	2.0
Wholesale and retail trade; repair of motor vehicle, motorcycles and personal and household goods	14.6	15.3	15.4	15.6	15.6	15.6	16.0	16.6
Hotels and restaurants	8.8	8.6	9.6	9.0	9.2	9.6	10.0	9.9
Transport, storage and communications	2.0	2.0	2.2	2.2	2.5	2.3	2.5	2.4
Financial intermediation	3.5	3.0	3.3	3.6	3.3	3.7	3.7	3.5
Real estate, renting and business activities	4.6	4.4	4.9	4.9	5.2	5.7	5.5	5.9
Public administration and defence; compulsory social	5.2	4.9	5.1	5.7	5.1	5.3	5.6	6.2

security								
Education	9.1	10.3	10.8	10.8	10.7	10.8	11.3	12.1
Health and social work	3.7	4.2	3.8	4.0	4.2	4.3	4.6	4.8
Other community, social and personal service activities	2.3	2.7	2.7	2.8	3.1	3.2	3.	3.5
Private households with employed person	7.2	6.8	6.9	6.8	6.4	6.7	5.9	6.1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Department of Statistics Malaysia, the Labour Force Surveys various years.

Table 3: Percentage Distribution of Female Labour Force by Occupation, Malaysia,2002-2010

Occupation	2002	2003	2004	2005	2006	2007	2008	2009	2010
Legislators, senior officials and managers	5.3	5.2	5.9	5.5	5.3	4.7	4.8	4.8	5.2
Professionals	6.1	6.4	6.7	6.7	6.9	7.1	7.3	8.3	8.4
Technicians and associate professionals	12.9	13.3	13.1	13.5	13.9	14.4	15.7	15.7	16.2
Clerical workers	17.3	17.7	17.5	19.0	18.6	18.7	19.3	19.3	19.7
Service workers and shop and market sales workers	17.1	17.4	18.4	18.2	19.4	19.9	20.1	21.0	20.1
Skilled agricultural and fishery workers	10.9	10.4	9.8	9.3	9.4	9.3	8.2	8.2	7.6
Craft and related trade workers	5.6	5.6	5.1	4.5	4.2	4.2	4.1	3.9	4.1
Plant and machine-operators and assemblers	12.5	12.1	11.4	11.3	11.0	10.1	9.4	7.7	8.3
Elementary occupations	12.4	11.9	12.0	12.0	11.4	11.6	11.1	11.2	10.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Department of Statistics Malaysia, the Labour Force Surveys various years

Table 3 indicates that there is a spread of female workers in various occupations, especially in (i) clerical workers, (ii) service workers and shop and market sales workers and, (iii) technicians and associate professionals. More women were in low-status occupations and were highly concentrated in feminised positions, and only a minority of them appears in three high-status occupations, namely: (i) legislators, senior officials and managers and, (ii) professionals. However, female participation in the professional jobs increased from 6.1 per cent in 2002 to 8.4 per cent in 2009.

3. Literature Review

In general, studies on the determinants of labour supply are closely related to studies on wage determinants. Mincer (1974) argued that wage is mainly determined by the level of education and other characteristics of the individual like working experience, types of job, location and gender. The labour supply model, which is based on the Household Production Model (Becker 1977), and Fallon and Verry (1988), demonstrates that the factors that determine the labour supply are similar to the determinants of wages, except that there are more additional variables, such as family size, spouse characteristics and non-labour income. For women in particular, the number of children and children's age structure are more important in determining their labour supply as compared to men (Gangadharan & Rosenbloom, 1996).

The elasticity of the labour supply with respect to the wage rate plays a critical role in the analyses of many economic policies. Most of the empirical results for the elasticity of hours of work with respect to the wage rate significantly differ in sign

and range. It appears from the literature that the first estimation on the labour supply elasticity was made by Douglass (1934) in his 'Theory of Wage'. He collected and aggregated the data for 38 US cities from the census of manufacturers and examined both time series and cross-sectional data concerning the hours of work and hourly earnings. He concluded that labour supply elasticity was between negative 0.1 and 0.2 (citation in Evers et al., 2008). Evers et al. (2008) mentioned that the modern labour supply often separates the income effect and substitution effect and makes use of micro data instead of aggregated data. Using data from US coal mining in the first decades of the 20th century, Manning (2003) showed that the quantitative relationship between employment and wages depends on whether wages are regressed on employment or the other way around, and indicated that this is the reason for the measurement error. He that even though it is reasonable to interpret this relationship as evidence of upward sloping supply curves, such regressions 'are just not very informative' on the supply elasticity.

Blundell and MaCurdy (1999) reported that across 18-20 estimates of own wage labour supply elasticity in various studies, the median elasticity was 0.08 for men and 0.78 for married women. For cross wage elasticity, Killingsworth (1983) pointed out that a median spouse wage elasticity of labour supply was 0.13 for married men and -0.08 for married women. However, a study by Devereux (2003) reported a cross elasticity of roughly -0.4 to -0.5 for women and -0.001 to -0.06 for men. These findings indicate that the labour supply of women is considerably more sensitive to their own wages than that of the men. This difference is usually explained by the traditional division of labour in the family, in which women are seen as substituting among market work, home

production and leisure, while men are viewed as substituting only or primarily between market work and leisure (Mincer, 1962).

Most of the literature on labour supply gives special attention to females because of their different characteristics compared with males, especially when dealing with house chores. Most studies mentioned a strong relationship between female labour supply and family size including the age structure of the children. In addition, their husband's characteristics like level of education and income also affect the female labour supply. For unmarried females, their own characteristics, such as level of education and wage rate, are more important.

One of the studies that support the importance of family structure to female labour supply is by Newman and Gertler (1994). They found that family structure is positively related to household production and female labour supply in Peru. The relationship between children's age and female labour supply was the main focus of the studies by Gronau (1973, 1988); Rosenzweig and Wolpin (1980); and Schultz (1990). All of them demonstrated that children's age structure has a significant impact on female labour supply with a negative effect for younger aged children (<6 years old) and a positive effect for the older age (>12 years old). The study by Wong and Levine (1992) in Mexico, and Tienda and Glass (1985) in the United States supported that mother substitute raised female LFPR. In addition, an increase in female LFPR after the Second World War II was due to a decrease in number of children (Coleman and Pencavel, 1993).

In a more specific study, Schultz (1978) found that when there was a three-fold increase in the number of children, female LFPR would decrease by 8-10 percentage points. The first child is shown to have a greater impact on female labour supply due to the higher attention given to him/her by the parent. For example, Rosenzweig and Wolpin (1980) found that the twin first birth reduced the female labour supply by 37 percentage points for the 15-24 age group and 10 percentage points for the 25-34 age groups. Augrist and Evans (1996) showed that in the United States, between 1970 and 1990, the probability of getting two children for women aged 21-35 years decreased by 18 percentage points, which subsequently increased their LFPR by 21 percentage points. The presence of children aged less than 6 years old has a greater negative impact on the female labour supply (see for example, Euwals 1999; Lehrer 1992); Carlin and Flood (1997) compared estimates of the male labour supply from time-use data with those from conventional survey data using a so called double-hurdle model. Referring to previous studies they noted that the presence of young children normally decreases work hours for women while the effect for males has typically become insignificant or weakly positive. In Malaysia, Rahmah and Fatimah (1999) found that the number of children aged below 6 years old and 7-19 years old has a negative impact on female hours of work in the handicraft industry (Rahmah and Fatimah 1999).

Most of the studies about the effect of spouse's wages to labour supply focus on the labour supply of wives in response to husbands' wages. Given the traditional gender roles, women are perceived as secondary earners within the family; hence, their labour supply is likely to be more negatively affected by their spouse's wages. Saget (1999) examined the effect on a married woman's labour supply decision of non-labour income and of her own wage rate in Hungary. The micro analysis showed that total monthly household non-labour income has been defined as the sum of two different income components, first, the sum of social transfers that are received by any member of the household, and, second, the monthly share of yearly profits. First, the empirical results indicated that wage elasticity for married woman is estimated to be significantly positive. Second, household earnings other than the wives' (alternatively, earnings of husband when he is head of the household) were estimated to have no significant negative effect on the probability of supplying labour. This implies that Hungarian women take their labour supply decisions independently of their husband's or other members of the household's earnings. Finally, the non-labour income effect is consistent with leisure being a normal good. However, Morissette and Hou (2008) demonstrated that the labour supply of Canadian wives responded strongly to changes in their husband's wages during the 1980s.

Generally, as workers age, they may prefer to decrease their number of working hours due to health constraints or care obligations. As a result, one may expect to observe a steady drop in working hours before full retirement. Penner et al. (2002) concluded that among older American workers, who left their job between 1992 and 2000, about 13 per cent would have stayed in their job if they could have reduced their number of working hours. In Sweden, about 7 per cent of the workers aged 50 years and above claim to have physical problems, which restrict them from continuing work in their present occupation until the official retirement age, but that shortening working hours would solve the problem (Wadensjo 2008).

Education is significantly correlated with economic growth, which, in turn, affects the labour supply pattern. Maglad (1998) found a significant positive effect of education on the female labour supply to the urban labour markets in Sudan. Conversely, Jolliffe (2004) showed that an increase in

the education level is associated with a decrease in the household labour supply and an increase in their off-farm labour supply in rural Ghana. Babikir and Babiker (2007) who studied the labour supply in Sudan, found a negative and significant relationship between education and the labour supply in the agriculture sector. Although the empirical findings are rather varied, a strong research tradition supports the human capital theory as a theoretical framework to clarify and predict the relationship between education and labour supply. Supposedly, labour with a higher educational level is more likely to be active in the labour force since education is an investment that is positively correlated to earnings' potential.

The effects of foreign workers are traditionally viewed in terms of complementarity or substitutability with natives in the production of household services. In the literature review, most of the simple theoretical models of labour supply suggest that an increase of foreign workers in the native labour market may result in lower wages and/or higher unemployment of natives if they are perfect substitutes to immigrants. In addition, empirical studies typically conclude that immigration is economically irrelevant or has no effect on the wages and employment of the native population; see Borjas (1994) for survey, in that foreign workers do not have a sizeable and significant effect on the employment and wages of the native population in the same segment of the labour market, even when the foreign workers supply stock is large. Card (2001) used the 1990 census data to study the effects of immigrant inflows on the United States labour market. He found that immigrant inflows over the 1980s reduced wages and employment rates of low-skilled natives in Miami and Los Angeles by 1-3 percentage points. These findings imply that massive expansion of immigrants may have significantly reduced the employment rates for the younger and less-educated natives in both cities.

The analysis of Borjas (2003) indicated that immigration lowers the wage of competing workers: a 10 per cent increase in supply reduces wages by 3 to 4 per cent. Using German data for the period 1975-1997, Bonin (2005) concluded that the direct impact of immigration on native wages is small, as a ten per cent increase in labour supply stemming from immigration is predicted to reduce wages by less than one per cent, with a stronger negative impact for low-skilled natives. In recent work based on US census data, Ottaviano and Peri (2006) extended the structural modeling approach of Borjas (2003) to assess the overall impact of immigration on wages while allowing for imperfect substitutability between native and immigrant workers. Their empirical estimates point to a negative, but small, direct partial effect: an immigration shock that increases the labour force in a particular skill cell by

ten per cent reduces the wages of natives of the same group by approximately one per cent. However, Peri and Sparber (2009) argued that increased specialization might explain why many empirical analyses of the impact of foreign workers on wages and employment for less-educated native born find a small effect. They found that foreign workers specialized in occupations that require manual and physical labour skills while natives specialized in jobs that required more intensive communication and language tasks. Mocetti and Porello (2010) showed that immigration in Italy had a displacement effect on low educated natives (both for males and for females).

4. Theoretical Framework and Model Specification

The theoretical framework for the analysis, which focuses on single female heads of households' labour supply, is based on the household production model developed by Fallon and Verry (1988). In this model, it is assumed that household maximising utility is subject to 3 constraints, household production function, household income and time. The equations can be written as follows:

$$U = U(X_i, L_h, L_w) \qquad (1)$$
s.t.
$$X_{Di} = f_i(H_i) \qquad (2)$$
$$X_{mi} = W_h M_h + W_m M_w + Y_n \qquad (3)$$
$$T_i = L_i + H_i + M_i \qquad (4)$$

Where, X is household's consumption, L_h is husband's leisure time, L_w is wife's leisure time, X_D is goods and services produced at home, X_m is goods and services produced at the market, W_h is husband's wage/market income, W_w is wife's wage/market income, M_h is husband's hours of work, M_w is wife's hours of work, Y_n is non-labour income, T is total hours per day, H is total hours of household work per day, L is total hours of leisure per day, M is total hours of market work per day and i is household.

Using the Lagragian for equation (1) until equation (4), the family labour supply equations are obtained as below:
$$M_i = M_i(W_h, W_w, Y_n) \qquad (5)$$
$$H_i = H_i(W_h, W_w, Y_n) \qquad (6)$$
$$L_i = L_i(W_h, W_w, Y_n) \qquad (7)$$

Apart from these three basic variables, there are other factors that could determine labour supply, such as number of children and the individual's characteristics, education, age, experience, training and so forth, which can be summarized as Z_i. Therefore, equations (5), (6) and (7) can be written as,
$$M_i = M_i(W_h, W_w, Y_n, Z_1, Z_2 \ldots) \qquad (8)$$
$$H_i = H_i(W_h, W_w, Y_n, Z_1, Z_2 \ldots) \qquad (9)$$
$$L_i = L_i(W_h, W_w, Y_n, Z_1, Z_2 \ldots) \qquad (10)$$

Another important aspect is to look at the income effect and substitution affect of labour supply as a result of wage and income change. For example, from the female labour supply function of equation (M_w) below, the most important variable is family income, (Y_f), which comprises non labour income (Y_n), husband's income ($W_h M_h$) and female's income ($W_w M_w$) as well as wife's wage rate and husband's wage rate (Cain 1966). Equation (8) can be written as:

$$M_w = a_1 Y_f + a_2 W_w + a_3 W_h + \ldots \quad (11)$$

$$M_w = a_1 (Y_n + W_w M_w + W_h M_h) + a_2 W_w + a_3 W_h + \ldots \quad (12)$$

$$M_w = a_1 Y_n + a_1 W_w M_w + a_1 W_h M_h + a_2 W_w + a_3 W_h + \ldots \quad (13)$$

$$M_w = a_1 Y_n + (a_1 M_w + a_2) W_w + (a_1 M_h + a_3) W_h + \ldots \quad (14)$$

In equation (14) the coefficient from W_w consists of income effect ($a_1 M_w$), which is hypothesized to be negative and the substitution effect (a_2) is assumed to be positive. The coefficient of husband's wage rate (W_h) also comprises two components, i.e., income effect ($a_1 M_h$) and substitution effect (a_3). Both effects are hypothesized to be negative. From equation (17), we derive:

$$\frac{\partial M_w}{\partial W_w} = a_1 M_w + a_2$$

But $a_1 = \dfrac{\partial M_w}{\partial Y_n}$

$a_2 = \dfrac{\partial M_w^c}{\partial W_w} =$ substitution effect

Then $\dfrac{\partial M_w}{\partial W_w} = \dfrac{\partial M_w}{\partial Y_n} M_w + \dfrac{\partial M_w^C}{\partial W_w}$ (15)

Or in the elasticity form:

$$\frac{\partial M_w}{\partial W_w} \cdot \frac{W_w}{M_w} = \frac{\partial M_w^C}{\partial W_w} \cdot \frac{W_w}{M_w} + M_w \frac{\partial M_w}{\partial Y_n} \cdot \frac{W_w}{M_w} \cdot \frac{Y_n}{Y_n}$$

.

or $\eta = \eta^C + \eta_{yn} \left(\dfrac{W_w M_w}{Y_n} \right)$ (16)

Rearranging equation (16), we obtain:

$$\eta^c = \eta - \eta_{y_n} \left(\frac{W_w M_w}{Y_n} \right) \quad (17)$$

and $\eta_{y_n} = (\eta - \eta^C) \left(\dfrac{Y_n}{W_w M_w} \right)$ (18)

Equation (17) is the substitution effect and equation (18) is the income effect.

4.1 Model Specification

The estimation model is specified to achieve the objective of this paper. These models can be written as follows:

$$M_{Wi} = \alpha_0 + \alpha_1 AGEF_i + \alpha_2 EDF_i + \alpha_3 NUMC_i + \alpha_4 WF_i + \alpha_5 NLY_i + \alpha_6 GLOB_i + \alpha_7 FOR_i + \mu \quad (19)$$

Where, Mw is hours of female's market work, AGEF is female age, NUMC is number of children, EDF is female year of schooling, WF is female's wage, NLY is non-labour income, GLOB is female's perception on globalisation after 1995, FOR is foreign workers and i is individual.

4.2 Data

The analysis will be based on the data collected from the field survey in 2011. The study covers 261 single female heads of households in Peninsular Malaysia who were chosen using stratified random sampling. The data include information on families, education background and employment background. Since the main purpose of this study is to look at the impact of globalisation on the labour market structure, the data also covers questions on globalisation from the points of view of the respondents.

5. Results

5.1 Profile of Respondents

Table 4a and Table 4b present the profile of the respondents. The majority of the respondents are aged between 46-55 years old (38.3 per cent), only 1.5 per cent are aged less than 25 years old and 17.2 per cent are aged more than 56 years old. The majority of respondents have 3-5 children and very few have more than 5 children. About 47.1 per cent of the respondents have secondary education, 31.4 per cent have tertiary education and only 21.4 per cent have primary level or less. The majority (31.4 per cent) receive income between RM2, 501-5,000 per month and more than half of them are involved in the services sector (68.1 per cent).

Table 4a: Profile of Respondents

Variable	Frequency (N= 261)	Per cent (%)
Age (Year)		
<25	4	1.5
26-35	37	14.2
36-45	75	28.7
46-55	100	38.3
>56	45	17.2
Number of Children		
1-2	192	73.6
3-5	62	23.7
6-8	7	2.7
Level of Education		
Primary and less	56	21.4
Secondary	123	47.1
Tertiary	82	31.4
Years of Schooling		
0-5	6	2.3
6-10	50	19.2
11-15	172	65.9
16-20	33	12.6

Source: Field Survey 2010

Table 4b: Profile of Respondents

Variable	Frequency (N= 261)	Per cent (%)
Monthly Wage		
0-1500	113	43.3
1501-2500	49	18.8
2501-5000	82	31.4
5001	17	6.5
Job Sector		
Services	179	68.6
Manufacturing	28	10.7
Agriculture	42	16.1
Construction	12	4.6

Source: Field Survey 2010

5.2 Descriptive Statistics

Table 5 presents the descriptive statistics of the variables. The mean monthly wage is RM2, 465.89 and the monthly non-labour income is RM937.06. All females in the sample attended formal education with an average year of schooling of about 10 years, 47 per cent attained secondary education and 31 per cent attained tertiary education. The balance of 22 per cent attained primary level of education.

Table 5: descriptive Statistics of the Variables

Variable	Mean	Min	Max	Std. Deviation
Monthly wage	2465.89	300	15500	2283.620
Year of Schooling	10.9234	0.00	17.00	3.59405
Secondary Education	.47	0	1	.500
Tertiary Education	.31	0	1	.465
Age	46.12	22	73	9.446
Non-Labour Income	937.06	350	2000	432.735
Number of Children	1.62	0	8	1.645
Min score for (after 1995)	5.45	1	7	1.154
Foreign Workers	.38	0	1	.487
Daily Hour of Work	8.18	4	14	1.546

The average age of single female heads of households is 46 years. Not everybody in the sample has children with the minimum zero and maximum 8 and the average of 1.62. The mean score on whether globalisation after 1995 affected their working environment is quite high at 5.45 and 38 per cent of the respondents say there are foreign workers at their workplace.

5.3 Regression Results

The estimation process involved checking for multicollinearity and heteroscedasticity. The multicollinearity was checked using the VIF test. The results show that all variables have a VIF value of less than 10. The White test was performed to check for heteroscedasticity and the result shows that the estimation has this problem. To correct this problem, we estimated weighted least squares regression; the estimation results are shown in Table 6.

The results demonstrate the expected sign for the coefficient of own wage and number of children, which are positive and significant. However, an increase in female non-labour income will increase the hours of work, which is against the theory. This can be explained by the nature of single females who are the sole breadwinners in the family; therefore, even though the non-labour income increases their labour supply will also increase. The non-labour income may provide females with initial capital to do business in the case of those who are involved in the business sector. The presence of foreign workers has a negative effect on female labour

The human capital variables, which are assumed to be positively related to the female labour supply, are found to be insignificant in both measurements year of schooling and level of educational attainment. This may be due to the involvement in the informal sector that is less dependent on the education level but where opportunity plays a more important role. As shown by

the national figures, 60 per cent of female employment is in the informal sector.

5.4 Income Effect and Substitution Effect

Using equation (16) and equation (17), we compute the substitution effect and income effect. The value of substitution effect is 0.5498, which implies that a one unit increase in female wage holding income constant will increase female market work by 0.5498 units. The income effect is 0.1143, which implies that a one-unit increase in females' income will increase their market time by 0.11143 units. The total effect is 0.6641, which implies that the single female headed household supply curve is upward sloping, which is in accord with the theory of labour supply. The slope is very steep, which reflects the low elasticity of female labour supply in the sample. This means that female labour supply is less responsive to the wage change, which is reasonable for the single head of household. Any changes in the wage rate make cause change in the hours of work to support the family because she is the sole breadwinner. Using equation (16) and equation (17), we compute the substitution effect and income effect. The value of substitution effect is 0.5498, which implies that a one unit increase in female wage holding income constant will increase female market work by 0.5498 units. The income effect is 0.1143, which implies that a one-unit increase in females' income will increase their market time by 0.11143 units. The total effect is 0.6641, which implies that the single female headed household supply curve is upward sloping, which is in accord with the theory of labour supply. The slope is very steep, which reflects the low elasticity of female labour supply in the sample. This means that female labour supply is less responsive to the wage change, which is reasonable for the single head of household. Any changes in the wage rate make cause change in the hours of work to support the family because she is the sole breadwinner.

6. Conclusions

The estimated results from single female heads of households' labour supply equations support the theory of labour supply except for the non-labour income. It is shown that their own wage is positively related to their supply of labour and non-labour income is significantly positive as well. However, the schooling variable, which is assumed to positively influence labour supply, is not statistically significant. In addition, the coefficient of age variable is negative and does not significantly determine the female labour supply. Number of children has a significant effect on the single female heads of households labour supply, which means that the larger the number of children the more hours women devote to their work. Another interesting finding is that the presence of foreign workers will reduce the female labour hours of work, which may be due to substitutability between the females and the foreign workers in their respective workplace. The female single head of household labour supply is found to be less responsive to wage change, which implies that single women have to work to support the family even though the wage rate is low and vice versa.

The results have some implications for policy, especially on wages and foreign workers. In order to encourage the participation of females in the labour market, wages should increase and this must be in line with productivity enhancement. Even though the female labour supply in the sample is less responsive to wage change, a wage increase will definitely enhance the welfare of the women's family. The study finds that the presence of foreign workers has a negative impact on women's labour supply. As such, the country must control the inflow of foreign workers, especially in the sector where the locals are willing to be involved, such as the manufacturing and services sectors.

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Table 6: Estimation of Results from the Labour Supply Model

Variable	Year of Schooling		Level of Education	
	I	II	III	IV
Intercept	4.139 (18.815)***	4.355 (17.049)***	4.058 (22.696)***	4.276 (18.390)***
Monthly wage	0.01 (14.103)***	0.01 (14.184)***	0.01 (13.582)***	0.01 (13.757)***
Years of Schooling	-0.001 (-0.119)	-0.004 (-0.326)		
Secondary Education			0.042 (0.567)	0.021 (0.285)
Tertiary Education			-0.436 (-1.163)	-0.508 (-1.372)

Age	-0.033 (-0.852)	-0.023 (-0.600)	-0.023 (-0.606)	-0.013 (-0.341)
Non-Labour Income	0.001 (2.775)**	0.001 (2.908)**	0.001 (2.724)**	0.001 (2.817)**
Number of Children	0.146 (8.792)***	0.160 (9.415)***	0.144 (8.481)***	0.159 (9.149)***
Min Score for effect of Globalization (after 1995)		-0.032 (-1.100)		-0.035 (-1.227)
Foreign Workers		-0.210 (-3.021)**		-0.209 (-3.001)**
R²	0.538	0.556	0.542	0.560
N	261	261	261	261

Note:**significant at 5% significance level

   *** significant at 1% significance level

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