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Socio-economic Factors on Demand for Children in Malaysia

Rohana bt Kamaruddin[1]

[1]*Universiti Teknologi MARA, Shah Alam, Malaysia, Faculty of Business Management*
E-mail: rohana070@salam.uitm.edu.my

Abstract: This study will focus on the socio-economic factors, namely education and employment of women and its impact on the demand for children in Malaysia. The role of women has increased overtime. Women's involvement in the economic activity will directly influence the fertility rate or the demand for children. This study employed a model based on the microeconomic approach to fertility which was pioneered by Becker (1960) and Becker and Lewis (1973), that household fertility decision are a function of family income, female wage, female employment and education. In this study, the presence of both Poisson and Negative Binomial distribution will be employed within the same study (Braga and Bond, 2008). The resulting Negative Binomial model was more appropriate for this particular data set because Poisson Pearson goodness-of-fit results indicate that the distribution of the number of children significantly differs for a Poisson distribution, according to the p-value of 0.000 ('Prob.chi2'), which falls below the standard threshold of 0.05. The scope of the studies in this research is female with child bearing age of 15 to 49. The result of the research will be grouped into two categories; the descriptive analysis of socio-economic, demographic characteristics, the number of children and quantitative analysis in the form of parameter estimation of the model. The finding revealed theoretically that relative income (higher wage return from education would indirectly decrease the demand for fertility), opportunity cost (as women education level increase, the opportunity cost of raising children increases and fewer children are preferred). The findings provide evidence from the scholarly, empirical study that socio-economics variable will have an impact on the demand for children.

Keywords: fertility, socio-economics, education, employment, women

1. INTRODUCTION

Malaysian women have continued to play an increasingly vital role in the development of the nation. They are highly important contributors to the country's economic and social development. The increasing number of women has been entering the labour force for family survival throughout their child-bearing and child-rearing years. Malaysia female labour force participation rate started to increase when women started entering

the labour force for family survival. Data on the labour force participation rate (LFPR) for women increased by 1.1 percent from the year 2010 to 2011. The highest LFPR for women was in the age group of 25-34 at 66.8percent in 2011 and it decreased significantly in the age group 35-44 years. The latest statistic shows LFPR for women increasing by 6.9 percent from the year 2010 to 2015. The highest LFPR for women is in the age group of 25-34 years old at 72 percent in 2015 and increases slightly for the age group 35-44 years old from 66.3% (2014) to 67% in 2015. Another fact is the increasing participation of women in their prime age of 25-54 years of paid work have been driving the employment trends and the gender gaps in the labour force participation rate, which is linked to the completion of the fertility transition.

Table 1 shows a comparison of the female mean age among the three main ethnic groups in Malaysia. The mean age of Chinese female is the highest (27 years old) followed by the Indians (26.1 years old) and Bumiputera (25.4 years old). The comparison shows Malay women tend to marry at an earlier age compared to the other ethnic groups. However, the overall mean age of mother at the first live births increased by 27.6 years in 2015 compared to 27.1 years in 2006.

Table 1
Female mean age at first marriage age 15 and over by the main ethnic group

Year/ Ethnic group	*2000*	*2010*
Bumiputera/ Malays	24.6	25.4
Chinese	26.1	27.0
Indian	24.4	26.1
Others	25.3	25.0

Source: Department of Statistic, Malaysia, updated 25 June 2013

Fertility involves women decision and is strongly influenced by economic and socioeconomic factors. Total fertility rate, as a statistic, measures the number of children each woman of childbearing age has in

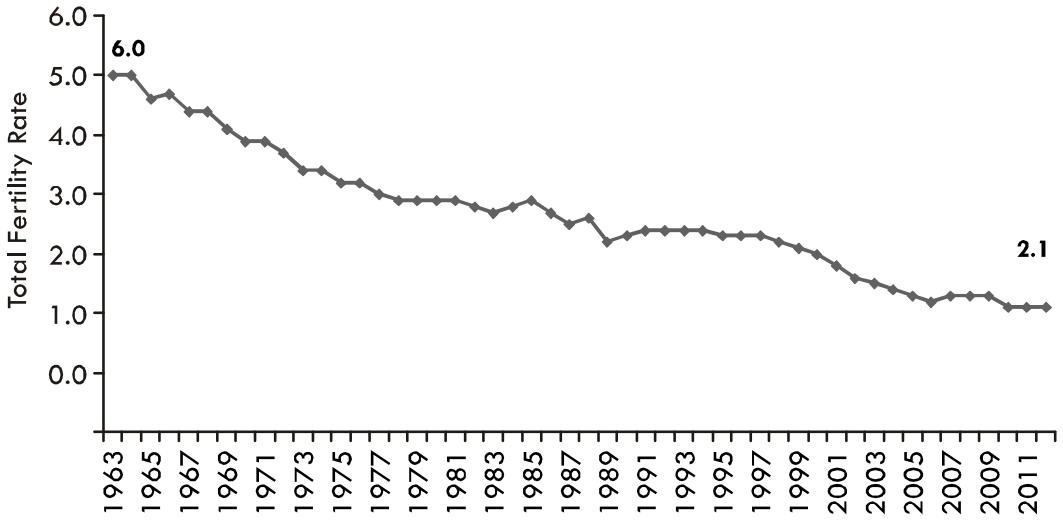

Figure 1: Total Fertility Rate, Malaysia 163-2012

Source: Department of Statistics, Various Vital Statistic 1963-2010

every nation. If this rate is above **2.0** it indicates that populations are increasing and median ages are lowering. Below this level, populations begin to shrink while the population becomes older. The level of fertility rate in Malaysia has been declining from 6.0 children per family in 1963 to 2.2 children per family in 2010 as shown in Figure 1. Fertility rates continue to decline from 2.0 in 2014 children per family and is expected to decline further in the coming years.

- According to the United Nations fertility projections, taking the medium fertility assumption, Malaysia TFR's will drop to 1.91 in 2020
- TFR will further drop to the lowest 1.76 in the period of 2045-2050.
- After the year 2055, the TFR will increase slightly to 1.84 in the period of 2095-2100.

According to a RAND published report entitled "Low fertility and population ageing: cause, consequences and policy options" (Grant *et al.* 2004), it stated that as fertility goes down, the mean age population increases, resulting in elderly people being higher relative to the younger youths. This will have serious consequences for policymakers, due to increases in pension and health provisions as people age and therefore fewer taxpayers. Figure 2 shows that percentage of population age 60 or older is on the increasing trend.

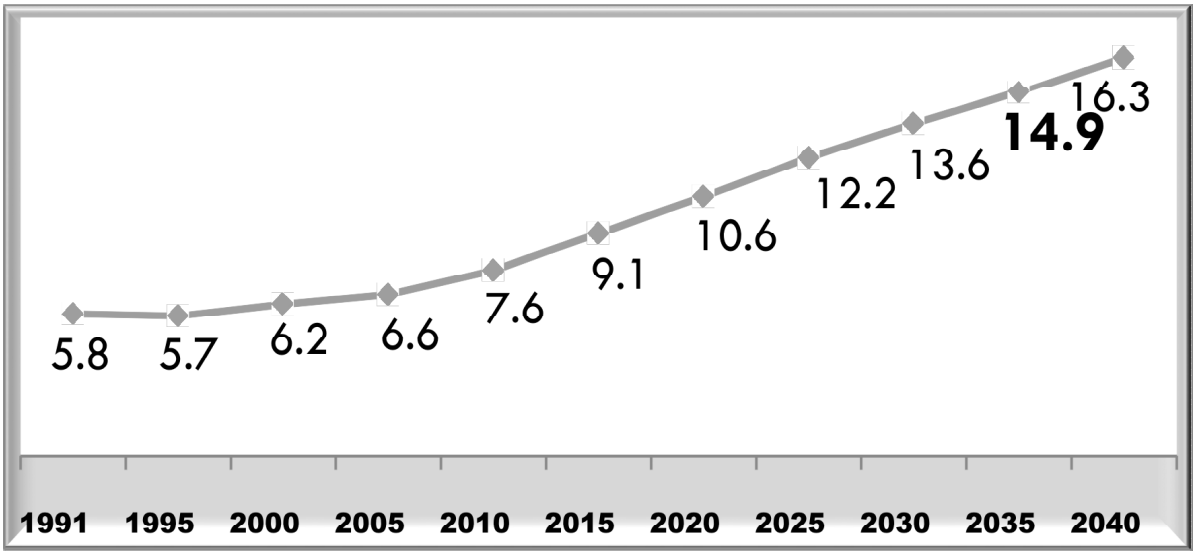

Figure 2: Percentage of population aged 60 years or older, Malaysia, 1990 to 2040

Source:
Department of Statistics Malaysia (1995), Population and Housing Census of Malaysia, 1991.
Department of Statistics Malaysia (2001), Population and Housing Census of Malaysia, 2000.
Department of Statistics Malaysia (2012), Population Projections, Malaysia, 2010-2040

An important limitation in conducting this research about the dynamics of fertility decision making is the unavailability of quantitative data that allows for a richly detailed examination of any country at a national scale. This study's analysis will expand upon the explanatory factors typically considered in studies of women household fertility decision making, by incorporating the socio-economics factor. The focus will centre on a female at child bearing age of 15 to 49 years old. The guiding assumption of this study is

that females must make fertility decisions within the dynamic environment of a family set up. The conditions influencing women on deciding the number of children are under the scope of demand for children. However, in this case, demand is derived from economics theory, but do not relate to the economic concepts because the supply of children does not change in response to demand. Therefore, in summary, the study attempts to investigate if Malaysian women formulate the desired fertility decision and whether the fertility decision is based on socioeconomic factors.

2. LITERATURE REVIEW

Socio-economic class forms the foundation on which the general well-being of children rests, both by directly affecting their health and by influencing parenting strategies (Coles, 2005). Most parents, no matter what their class status, have similar long-term goals for their children. They want them to have health, security, and the capacity to lead a successful life (Hill, 1999). However, research indicates a class difference, in which behaviours and values are important to achieve those goals. Working class family believes in obedience, conformity, good manners and respect for authority, while middle-class families are more likely to instill initiative, creativity, curiosity and independence in their children (Kohn, 1977).

The level of women's autonomy has positive correlations with socio-economics variables. The theory of the allocation of time in Becker (1965) implies the importance of labor supply and fertility decisions. In this framework, fertility decision is viewed as an economic one, and that one of the costs of having a child is the forgone earnings of the person caring for the child at home, in most cases the mother. Likewise, the level of income can influence the fertility rates under the economic choice model of Becker and Lewis (1973). Accordingly, when having children are regarded as consumption goods than its demand need to compete with the demand for other goods. Therefore, the benefits of having children must be more than the cost (time taking care of the children) and the possible associated loss of income. As a result, an increase in real income would tend to reduce the fertility rate as rising income means less demand for children. Cochrane (1983) conducted an extensive review of empirical findings on the education-fertility relationship for different countries and concluded that "the differences between the extreme education categories are typically at least one-half a child".

Education is found to be associated with lower fertility (Barro, 1991 and Shultz, 1993). Educated women are more likely and could reduce their fertility rate in several ways; planning family size, higher status of women to make a decision and delay the age of marriage (Gani, 1999). If a woman devotes most of her time to market work, then she should decrease her leisure time and the number of children. In Kenya, a study on trends in contraceptive use using data from 1977-1978 and 1989 at both the aggregate and subgroup level, it was found that females with education partly contribute to the decline in Kenya's fertility rate and delay in marriage (Njogu, 1991).

Heaton (2010) in his study which includes two key social characteristics that influence fertility, namely education and urban/rural residence found consistency with prior research. The study shows fertility declines as the mother's education increases and fertility is lower in urban areas. Other empirical studies have shown a parallel increase in women's level of education and participation in the labour force at the same time as a decrease in fertility rates (Black and Juhn (2010), Dolado *et.al,* (2001, 2002), Sheran (2007). It is not childbearing per se but child rearing, the process of caring for and raising a child from birth to adulthood that leads to the negative relationship between fertility and labor force participation (Bernhardt 1993).

2.1. Population- Family Policies

According to Chesnais (1996), a nation's family policies can be distinguished into two differences;

i) nations of families – extended family has primacy in all important life decisions (marriage and child-bearing) and in which family networks typically provide service ranging from childcare to banking.

ii) nations of individuals – espouse a strong philosophy of individualism and equality.

His observation continues by using country example, nations of families take two forms, Germany – either they are strongly supportive of families comprising of breadwinner – father, homemaker-mother and their dependent children and Italy, they do little that could be construed as challenging or interfering with the prerogatives of such family. As for country countries like Austria, Belgium, Germany, the Netherlands, and Luxembourg who share a strong commitment toward families, backed by monetary allowances for housing, child beneût packages, and well-paid maternal leave. However, UK and Sweden, which adopt policies in "nations of individuals", supportive of women rights and concerned with children's living standard and recognize a diversity of family forms and not just the breadwinner-homemaker model. Malaysia on the other hand, adopt more on nations of families and more towards the breadwinner and dependent children.

2.2. Malaysia Population Policy

The first national policy that concerned population growth was National Family Planning Program in 1966 with the objective to reduce the population growth rate and to increase the average annual income. In the 1980s, when the industrial structure of the Malaysian economy had changed gradually, the service sector contributed to a larger portion of the gross economic activity. These changes need to be supported by a larger population and a larger domestic market. Then, under the administration of Tun Mahathir (Malaysia 4rd Prime Minister), a new demographic target of 70 million population was initiated.

In 1984, the National Population and Family Development Program were established based on aspects of health and family's health. Under the program, Reproductive Health Education Policy and the National Social policy on reproductive health and social education that applies to everyone, regardless of age, religion, cultures and values of life in Malaysia. In 1989, National Policy on Women was adopted to ensure equitable sharing of resources and development opportunities between men and women and to integrate women in all sectors of development in accordance with their capabilities and needs.

Below is the list of several initiatives outlined by the Malaysia government:

i) Under 8th Malaysia Plan – family development program focused on building better family relationship and creating awareness on the importance of the family as social institution.

ii) The Family First Campaign (2003)- create awareness and recognition of a Social priority and fundamental unit of society. These includes 5-day working a week, 90 days maternity leave, paternity leave from 3 to 7 days a week.

iii) SMART START package – information on marriage preparation, family health, pregnancy and childbirth, parenthood and managing family resources.

iv) 9th Malaysian Plan (2006-2010) – awareness and provide knowledge to parents and the importance and need to balance work and family responsibilities.

v) Under the Ministry of Women, Family and Community Development implemented a Parenting Work Program (May 2007) – guidance on parenting skills, ensure stable and resilient families and to equip families to face modern day challenges and work-life balance issues.

vi) Second Population Strategic Plan Study, 2009 shows that Malaysian families are getting smaller and the total fertility rate is dropping much faster. Some recommendations

- A period of paid paternity leave
- Paid compassionate leave in cases of children's sickness
- More flexible working hours
- Child-minding facilities at the workplace
- Government subsidies for childcare costs incurred by working mothers
- Increasing tax concession for dependent children
- Programmes to encourage husbands to be more fully involved in childrearing and household activities
- Urgent needs for contraception need to be fully met

Few incentives for children related to financial assistance:

– Free textbooks for primary students and hostel facilities for under privileged children and lower income household.
– Tertiary education level – low-income households through the National Higher Education Fund.
– Reduce cost for schooling – textbook loan scheme, hostel facilities, tuition voucher scheme and poor student trust fund.
– Tax relief – RM2000 per child below 18 and RM8000 for children aged 18 and above with full-time tertiary education.
– Education and health premium insurance – RM3000 tax relief.
– Fees for childcare centre -RM2000
– Deposits for child under Education, National Account Scheme – RM6000

Furthermore, the Malaysia government also has created Protection and rights for women under the law that influences the increase of employment rate for women:

The Employment Act, 1995 spells out the following provisions for women:

- Prohibition from night work but which can be overruled by the Director General of Labor. Most employers get this ruling from the Director general almost upon application
- Women workers in the private sector are given 90 days maternity leave while those in the public sector are given 60 days maternity leave. All are given leave for 5 surviving children. There also provisions prohibiting an employer from dismissing women when she is pregnant or when on maternity leave.

- Although a wife's income tax can be assessed separately, she is not given any relief for maintenance of children. This affects many single female parents.
- Though there is no specific law for sexual harassment, the case law has set precedence for such cases.

3. DATA AND METHODOLOGY

The source of data is from the Minnesota Population Centre, Integrated Public Use Microdata Series (IPUMS) in which the data are provided by the Department of Statistic Malaysia and census microdata containing information collected was of persons and households. The responses of each person and household with the different census questions are recorded in separate variables. However, for this study, only females within the household will be analysed at the child-bearing age of 15-49 years old.

3.1. The Poisson Model

One of the earliest attempts to model count data involves the Poisson distribution (Johnson et.al 1992), which can be used as a framework to analyse discrete events that take place randomly and independently in either time or space.

The univariate Poisson distribution, denoted by Poisson (n|ë), for the number of children of n over a fixed exposure period has the probability mass function. In the Poisson model the probability that N_i equal n is given by

$$P_r(N_i = n) = \frac{e^{-\lambda i}\lambda_i^n}{n!} \tag{2}$$

where N_i is a non-negative integer and λ_i is the expectation (and also the variance) of the random variable N_i. The regressors of λ_i is specified in a conventional way: $\lambda_i = \exp(b_0 + X_i ß)$, where ß is a coefficient vector and b_0 can be estimated by substituting for λ_i the above equation and applying the maximum likelihood method.

3.2. Negative Binomial Model

Negative binomial regression models do not assume an equal mean and variance and particularly correct for overdispersion in the data, which is when the variance is greater than the conditional mean (Osgood, 2000; Paternoster & Brame, 1997).

In negative binomial regression, the distribution is specified in terms of its mean, m, which is then related to explanatory variables as in linear regression or other generalized linear models. The probability mass function then becomes

$$\Pr(X = k) = \left(\frac{r}{r+m}\right)^r \frac{\Gamma(r+k)}{k!\Gamma(r)}\left(\frac{m}{r+m}\right)^k \quad \textit{for } k = 1, 2, 3 \tag{3}$$

The variance can then be written, $m + m^2/r$ and the parameter r is referred to as the "dispersion parameter", "shape parameter" or "clustering coefficient", or the "heterogeneity "or "aggregation" parameter.

3.3. Model Specification and Variables Specification

$$NCHILD = ß_0 + ß_1 SPLOC_{ij} + ß_2 MARST_{it} + ß_3 URBAN_{ij} + ß_4 RELIG_{it} + ß_5 AGE_{it} + ß_6 ETHN_{ij} + ß_7 OWNRSHP_{it} + ß_8 OCCISCO_{it} + ß_9 EDUC_{it} + \mu_t$$

Variable definitions

- NCHILD = number of own children in the household female
- SPLOC = 1 if spouse's location in the household, 0 otherwise
- MARST = marital status
- URBAN = 1 if urban, 0 otherwise
- RELIG = religious belief
- AGE = childbearing age category (15-49 years old)
- ETHN = ethnicity
- OWRSHP = 1 if ownership of dwelling, 0 otherwise
- OCCISCO = type of occupation
- EDUC = education attainment

The number of children (NCHILD) comprises information on the number of own children living in the household. The number of children, the dependent children, is treated as count number in Poisson and negative binomial model. The number of children by all women in the child-bearing of 15-49 years.

The socio-economic variables used as independent variables are, place of residence, ownership, and spouse in the household age group of the respondent, marital status, religion, ethnicity/race, education and types of occupation. Many of the independent variables were categorical variable.

4. RESULTS AND DISCUSSION

4.1. Descriptive Analysis

This section will present a descriptive analysis of socioeconomic and demographic information of the available data. As depicted in Table 2, female respondents formed 49.5 per cent from Malaysia. The mean age for childbearing is 25.67. In terms of marital status, there are more single women in Malaysia which makes about 57.1 percent and married women by 39.2 percent. Apart from that, most of the respondent comes from the ethnic Malays, which formed about 50 percent of the total respondents, in terms of religion, a total of 59.8 percent respondents are Muslims. The majority of the women (32.68 %) were between the age group of 20-29, followed by the age group of 30-34 (15.14 %). Thus, this would suggest that the findings will largely represent the middle-aged of childbearing.

Only 4.8 percent completed university level education, a total of 41.9 percent only have had primary education. The information on spouse, ownership and location background provides another important insight into the socio-demographic profile of the sample. The majority stay in urban areas (61.1%). In terms of ownership, both countries show about 70 percent of household own a house and only 35.5 % on the spouse living in the household.

Table 2
Malaysia 's socioeconomic and demographic characteristics (%) 1991

Characteristics	%
Sex (% Female)	49.5
Age – Mean	25.67
Marital Status	
• Single	57.1
• Married or cohabiting	39.2
• Separated/ Divorce	6.0
• Widowed	3.1
Education	
• No qualification	50.9
• Primary/ Level 1	41.9
• Secondary/Level 2	2.4
• University/ Level 3	4.8
Religion	
• Muslim	59.8
• Buddhist	18.8
• Hindu	6.3
• Christian	8.5
• Others	6.5
Race	
• Malay	50.0
• Chinese	25.3
• Indian	7.4
• Others	17.3
Age	
• 15-19	18.57
• 20-24	16.45
• 25-29	16.23
• 30-34	15.14
• 35-39	13.68
• 40-44	11.33
• 45-49	8.59
Spouse in the house	
• Yes	35.5
• No	64.5
Ownership (own a house)	
• Yes	70.4
• No	29.6
Urban	
• Yes	61.1
• No	38.9

Table 3 shows that 45 percent of the household have no children, 12 percent (1 child), 14 per cent (2 child) and 21 percent (3-4 child).

Table 3
Descriptive Analysis on Number of Children - Malaysia

Number of children in the household	*Frequency*	*Percent*	*Cumulative Percent*
0	91,080	44.80	44.80
1	23,411	11.52	56.32
2	28,430	13.98	70.30
3	26,164	12.37	83.17
4	17,011	8.37	91.54
5	8,854	4.36	95.90
6	4,448	2.19	98.08
7	2,149	1.06	99.14
8	1,006	0.49	99.64
9	741	0.36	100
Total	203,294	100	

4.2. Analysis of Regression Result

In order to choose between Poisson and negative binomial regression, the decision will depend on the nature of the distribution of the dependent variable. Table 4 displays the result of a Poisson Pearson goodness-of-fit results which indicate that the distribution of the number of children significantly differs from a Poisson distribution, according to the p-value of 0.000 ('Prob.chi2'), which falls below the standard threshold of 0.05. Therefore, negative binomial regression is more appropriate for this particular data set.

Table 4
Poisson goodness-of-fit test

Deviance goodness-of-fit	=	64654.7
Prob > chi2 (76127)	=	1.0000
Pearson goodness-of-fit	=	90464
Prob > chi2 (76127)	=	0.0000

Table 5 displays the result of Negative Binomial output. The default model for negative binomial is mean dispersion. The coefficient interpretation of the negative binomial regression coefficient is as follows: for a one unit change in the predictor variable, the difference in the logs of expected counts of the response variable is expected to change by the respective regression coefficient, given the other predictor variables in the model are held constant. The coefficient interpretation is as follows;

Table 5
Specification results Negative Binomial regression

Variables / Category	*Negative Binomial*
Urban	0.130***
Ownership	-0.100***
Education	
– Primary	-0.050***
– Secondary	-0.149***
– University	-0.161***
Occupation	
1 - Legislator	0.079
2 - Professional	0.019
3 - Technician	0.011
4 - Clerks	-0.078
5 - Service Workers	0.057
6 - Skilled workers	0.179**
7 - Crafts	0.075
8 - Operators	-0.059
9 - Elementary workers	0.019
Constant Value	-2.966
Log Likelihood	-334032.59
Pseudo R^2	0.253

Note: ***=p<1%, **=p<5%,*=p<1%, No of observation: 76160

The proxy for relative income effect; ownership and education show negative sign and significance. The education coefficients are higher as the level of education increase. Therefore, higher education may lower fertility as female schooling may increase the opportunity cost of child-bearing and rearing among educated women (Becker, 1981; Shultz, 1981). As for occupation among females, only clerks and operators show negative sign but it not significant. However, for the higher level of occupation, results were not significant but shows a positive sign. Only skilled workers were found to be positive and significant. These indicate females with high-rank position prefers fewer children, more towards the quality of children. Whether the family secures a home or not, it does not affect the decision of having children. The estimated coefficient for education which is a proxy for opportunity cost for women are negative and gets larger as the education level increases. This result indicates that as the opportunity cost of raising children increases, households prefer fewer children. The urban women show results show a positive coefficient and ~~is~~ are significant.

The other option to evaluate this model is to analyse the effect of the independent variable on the dependent variable through the incidence rate ratio (IRR). Table 6 shows the incidence rate ratios (IRR) which represent the change in the dependent variable in terms of a percentage increase or decrease, with the precise percentage determined by the amount the IRR is above or below 1. The IRR for urban women (13.9%), ownership (9.04%), primary education (9.5%) and lastly for skilled workers (19.6%).

Table 6
Negative binomial regression results with reported incidence rate ratios - Malaysia

Variables / Category	*Incidence rate ratio*
Urban	1.139***
Ownership	0.904***
Education	
Primary	0.950***
Secondary	0.861***
University	0.850***
Occupation	
1 - Legislator	1.082
2 - Professional	1.019
3 - Technician	1.011
4 - Clerks	0.924
5 - Service Workers	1.059
6 - Skilled workers	1.196***
7 - Crafts	1.077
8 - Operators	0.942
9 - Elementary workers	1.020
Log Likelihood	-83080.653
Pseudo R^2	0.303

Note: ***=p<1%, **=p<5%,*=p<10%, No of observation: 76160

5. CONCLUSION

Overall the findings conclude that differences in fertility behavior and fertility levels in different areas and among population strata or characteristics no longer hold, as the similarities of such declining trends due to socio-economic factors. The proxy variables, namely education, and types of occupation prove that women with higher education and top position prefer fewer children and more towards the quality of children. In addition, as the opportunity cost of raising children increases, women prefer fewer children. The changes in the scenario of the Malaysia level of fertility from the past to future projections will reflect the Malaysian Government's population policy in providing more conducive settings at the macro and micro level for the population. These environments will have to be supported by factors such as fertility promotion measures, friendly employment policies, flexible working hours and availability of quality childcare providers that is acceptable and at an affordable cost.

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