Female Labor Force Participation in Malaysia

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Abstract: The purpose of this study is to perform a time series analysis of female labor force participation in Malaysia. The objective of this study is to examine the effects of social and economic development on Malaysia female labour force participation. The study applies Dynamic Ordinary Least Square (DOLS) method and the period of study covers from 1982 to 2016. The dependent variable is female labour force and the independent variables are economic development, inflation rate, and fertility. The results show that fertility is statistically significant in explaining the female labor force. The findings of this study are important for the policy makers in the respective areas. .

Keywords: *Female labour force,GDP per capita, Fertility,Inflation*

INTRODUCTION

The role of manpower is vital to make a country grows and prosperous. In the modern world of today, women are also part of the workforces. They contribute to the world economic activities and countries through their productive and reproductive roles. The increasing trend of women workforce can also be found in Malaysia. Their participations are not only focused on the areas of employment associated with women, but also in many other areas that was formerly monopolized by men. According to the Department of Statistics Malaysia the total women's labour force participation rate has increased over the years since 1982 to 2016. However, the rate is still relatively low than that of men.

Nowadays, the education level of women has improved. They study various professional fields such as medicine, engineering, law, accountancy and others. With the expansion of women`s access to education, they are able to fill in the job opportunities in these fields that have been dominated by men. In addition, the number of single mothers has increase in our society over the years. Most of them are victims of divorce, uncoupled suspension or dismissive husbands for irresponsibility. Given these situations, they face difficulties in raising and educating children. Thus, this has prompted women to engage in the labour market.

We cannot deny that women play an important role in social and economic development. The active participation of women in employment subsequently enhances a stronger momentum growth of various economic sectors. Hence, this lead us to investigate what are the factors, from the economic analysis, that motivate women to participate in labour market. The factors that are included in our study consist of economic development, fertility, and price level in the country.

LITERATURE REVIEWS

Labour force participation rate is defined as the portion of working population in the age group of 16-64 in the economy currently employed or seeking employment. People who are still undergoing studies, housewives and retirees are not part of the participation rate. Economic growth has been go together with the greater participation of women in the formal workforce and in a range of

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other activities. The rapid economic growth largely increased female labour force participation in Malaysia. This is due to the growth in the manufacturing and services sectors. This is also in line with the study of Fatima and Sultana [1] that there is positive relationship between economic development and female labour force participation.

On the other hand, Karshenas and Moghadam [2] found that in MENA countries, during their transition from some traditional agrarian societies to more modern ones in the recent decades, higher GDP per capita allowed women to stay home and contribute less to the labour market of their societies. Generally, the substitution effect leads to higher potential female wages which overcomes the income effect, raising female labour force participation as income per capita rises [3]. The high rate of economic development is encouraging the female participation in the labour force by increasing the work opportunities for females. Besides that, a continuously increase in the general prices of goods or services in a country, or inflation, could also one of factors that push women to engage in labour market. High inflation rates will increase people's living costs and this will reduce their quality of life, or purchasing power. According to Tam [4], an increase in the cost of living causes many females are working to overcome the problem of rising prices for goods. There is a positive relationship between inflation and female labour force participation rate.

Women's reproductive behavior is measured by the fertility births rate. There are many articles which studied the effect of fertility on female labour force participation. Roopnarine and Ramrattan [5] found that the presence of children in the household had negative effects on participation. Thus, there is a negative relationship between fertility rate and female labour force participation rate, indicating that as the fertility rate decreases, female labour force participation rate increases.

METHODOLOGY

Theoretical framework

The theoretical framework of this study is presented in Figure 1. As shown in Figure 1, the dependent variable is female labour force while the independent variables are economic development, fertility and inflation rate.
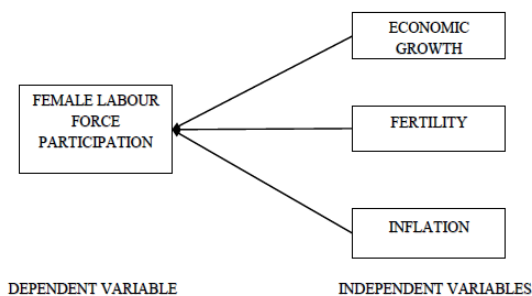

Figure 1: Theoretical Framework

Model specification

In line with the theoretical framework, the model specification of this study is written as follows:

$$FE_t = \beta_0 + \beta_1 GDPPC_t + \beta_2 FERT_t + \beta_3 INF_t + \varepsilon_t$$

(Eq. 1)

where:
FE = Female labour force participation
GDPPC = Economic growth
FERT = Fertility
INF = Inflation
β_0 = Constant
$\beta_1, \beta_2, \beta_3,$ = Coefficients to be estimated
ε = Error term
t= Time period

Equation (1) is then transformed into natural logarithm as expressed in equation (2). This is to make interpretation easier as the coefficients are interpreted as elasticities. Thus, equation (2) is the model that will be estimated.

$$lnFE_t = \beta_0 + \beta_1 lnGDPPC_t + \beta_2 lnFERT_t + \beta_3 lnINF_t + \varepsilon_t$$

(Eq. 2)

The period of study ranges from 1982 to 2016, using yearly time series data of Malaysia. The variable female labour force participation is measured by the number of female labour force. Economic development or growth is represented by the rate of GDP per capita. We expect a positive relationship between economic growth and female labour force participation because as a country develops, it needs more resources, specifically labor force, to support the expansion in the production. Thus, this will induce more women to engage in the employment as well. The variable fertility is measured by fertility rate, total (births per woman). We expect a negative relationship between fertility and female labour force

participation. This implies that women with less number of children or low fertility tend to work as they have more time can be spent in their jobs. The price level in the country is measured by rate of inflation. We expect a positive relationship between inflation and female labour force participation because when price of goods and services increase, it makes the cost of living increases that will diminish the purchasing power of household. Thus, to compensate the declining purchasing power, it motivates women to work. The data of female labor force and fertility are obtained from Department of Statistics Malaysia, while percentage of GDP per capita and inflation rate are collected from World Bank.

Estimation method

In conducting a time series analysis, we will first perform a correlation matrix with the purpose to check the multicollinearity problem. Multicollinearity is a state of very high inter-correlations or inter-associations among independent variables. It is a type of disturbance in the data. If any two independent variables present the coefficient above 0.90, meaning that these two variables are highly correlated and leads to the multicollinearity problem. As a result, the statistical inferences made about the data may not be reliable. We also examine the behavior of each variable or series by using unit root or stationary test. This is because most of the macroeconomic variables are trended or non-stationary. If we regress these trended variables, then the estimated regression will be spurious or invalid. Thus, we apply augmented Dickey and Fuller (ADF) stationary test [6] and Phillips and Perron (PP) stationary test [7] to identify the order of integration. Both ADF and PP tests have the same null hypothesis (Ho) where null hypothesis is non-stationary or trended. If null hypothesis is rejected, it is said that the variable is not trended and it is stationary. If the variable is stationary at the level form, it can be explained as integrated of order 0 or I~ (0). If it is stationary at first difference, it is integrated of order 1 or I~ (1).

After identifying the stationarity of each variable, we perform cointegration test. Cointegration test aims to determine whether there exists a long-run relationship among the variables in the model. If dependent variable and independent variable are cointegrated, this implies that the long-run relationship exists and these variables have a meaningful relationship. Last but not least, in the long-run estimation, we apply dynamic ordinary least square (DOLS) method to examine the significance of the variables. DOLS has an advantage of solving autocorrelation problem and

endogeneity [8]. Thus, we use lead and lag to overcome endogeneity and autocorrelation, respectively. If the *p*-values of the independent variables is less than 0.10 or 10%, then the respective independent variable is statistically significant in explaining the dependent variable.

RESULTS DISCUSSION

Correlation matrix

The result of correlation analysis is presented in Table 1. The matrix shows that high correlation among the independent variable does not exist. because none of the two independent variables present the coefficient higher than 0.90. Thus, there is no multicollnearity problem in the model.

Table 1: Correlation matrix

	FE	GDPPC	FERT	INF
FE	1.000000			
GDPPC	-0.050837	1.000000		
FERT	-0.950071	0.073964	1.000000	
INF	-0.208433	0.194930	0.199119	1.000000

Unit root test

We perform unit root tests for each variable using ADF and PP tests. Both tests include trend and intercept and the maximum lag used is 2 given a small sample size. Based on Table 2, the ADF and PP tests illustrate that economic growth rejects Ho at level form with 1% significant level. Inflation rate also rejects Ho at level form with 5% significant level. Thus, this implies that both economic growth and inflation rate are stationary at level which is integrated at order 0, I ~ (0). On the other hand, female labor force and fertility reject Ho at first-difference with 1% significant level, or integrated at order 1, I ~ (1). This means that trends in both variables are removed after taking the first differencing.

Table 2: Unit root tests

Series	Level		1st -difference	
	ADF	PP	ADF	PP
lnFE	-2.40	-2.51	-5.25***	-5.80***
lnGDPPC	-5.47***	-5.47***		
lnFERT	-3.07	2.93	-7.72***	7.72***
lnINF	-4.20**	-4.16**		

Cointegration test

Table 3: Cointegration test

Lc statistic	Stochastic Trends (m)	Deterministic Trends (k)	Excluded Trends (p2)	Prob.*
0.212599	1	0	0	> 0.2

Table 3 displays the result of cointegration test. We found out that Lc statistic 0.21 is greater than 0.20, thus we conclude that the model is cointegrated or valid. This shows that there is a long-run relationship between female labor force and its determinants.

Long-run estimation

The purpose of conducting long-run estimation is to identify which of the independent variable is statistically significant in influencing the dependent variable. Table 4 is the result of long-run estimation by using DOLS regression. The number of lead and lag used are 2 to overcome endogeneity and autocorrelation, respectively. The R-squared (R^2) is 0.95, indicates that about 95% of the variability in the dependent variable can be explained by the variability in the independent variables while another 5% remains unexplained. Furthermore, the R-squared is lower that Durbin-Watsons statistics (DW) 1.27, this confirms that the model is not spurious to make inference. Our study shows that all the variables achieve the expected sign or relationship as provided in the literatures. Economic growth and inflation give positive effects to the female labor force while fertility generates negative effects to the female labor force. However, among these independent variables, only fertility is statistically significant at 1%. This indicates that fertility is the factor that affects female labor force in this study. Given that fertility is decreased by 1%, the female labor force would be increased by 1.33%. This implies that low fertility or less number of children would induce women to venture into employment. This is because women can spend more time in their jobs

[1] Fatima, A. & Sultana, H. (2009). Tracing out the U-shape relationship between female labor force participation rate and economic development

and give more commitment to the organization. They also have opportunities to rise to the top levels of the organization.

Table 4: Long-run estimation

Dependent variable: lnFE	Coefficients	Standard Errors	t-Statistics	p-Values
Intercept	9.303286	0.120784	77.02447	0.0000
lnGDPPC	0.063465	0.056443	1.124411	0.2774
lnFERT	-1.336884***	0.128373	-10.41404	0.0000
lnINF	0.048334	0.043526	1.110466	0.2832
Lag & Lead	(2,2)		Mean dependent var	8.066877
R²	0.958280		S.D dependent var	0.269406
DW statistics	1.270474		Sum squared resid	0.072672

CONCLUSION AND POLICY IMPLICATIONS

This paper aims to analyze the economic and social factors in affecting the participation of female labor force. The sample of study is based on Malaysian time series yearly data ranged from 1982 to 2016. Given a small sample size, we employ dynamic ordinary least square (DOLS) to examine the presence of cointegration and long-run coefficients of the variables in the multivariate model. The results of cointegration test confirm that the variables in the model are cointegrated, or tied together in the long-run. Specifically, the model is meaningful. From the aspect of long-run estimation, the study reveals that fertility negatively affect the female labor force in Malaysia. This suggests that low fertility drives women to involve in employment that contribute to the increasing trend of women labor force participation. This scenario might give some implications to the gender distribution of job and structure of population in future. The respective policy makers would look into the matters of family planning, incentive for childbearing and the facilities provided by the organizations.

REFERENCES

for Pakistan. *International Journal of Social Economics*, vol. 36, no.1/2, pp. 182-198.

[2] Karshenas, M. & Moghadam, V. (2001). Female labor force participation and economic adjustment in the MENA region. *The Economics of Women and Work in the Middle East and North Africa* (*Research in Middle East Economics, Vol. 4*), Emerald Group Publishing Limited, Bingley, 51-74.

[3] Gaddis, I. & Klasen, S. (2011). *Economic development, structural change and women's labor force participation: A reexamination of the feminization U hypothesis*. Discussion Papers, No. 71, Georg-August-Universität Göttingen, Courant

[6] Dickey, D. & Fuller, W. (1981). Likelihood ratio statistics for autoregressive time series with a unit root. *Econometrica,* 49, 57–72.

[7] Philips, P. C. B. & P. Perron (1988). Testing for a unit root in time series regressions, *Biometrika,* 75, 335-346.

Research Centre - Poverty, Equity and Growth (CRC-PEG), Göttingen, Germany.

[4] Tam, H. (2011). U-shaped female labor participation with economic development: Some panel data evidence, *Economics Letters*, vol. 110,140–142.

[5] Roopnarine, K. A. & Ramrattan, D. (2012). Female labour force participation: the case of Trinidad and Tobago. *World Journal of Entrepreneurship, Management and Sustainable Development*, vol. 8 no. 2/3, 183-193.

[8] Stock, J., and Watson, M. (1993). A simple estimator of cointegrating vectors in higher order integrated system. *Econometrica,* 61(4), 783–820.