

Determinants of Female Labor Force Participation Rate: Evidence from Malaysia.

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ABSTRACT: The purpose of this study is to examine factors affecting female labor force participation rate (FLFPR) in Malaysia. Time series data for the period of 1987 to 2018 was used and collected from the Department of Statistics Malaysia and The World Bank. Three independent variables which are fertility rate, economic development and inflation rate, were selected to see their effects on the female labor force participation rate. The multiple regression analysis was employed to determine each variable's significant impact on female labor force participation rate. The autocorrelation and multicollinearity tests were also employed. Findings show that fertility rate is the most important variable affecting the female labor force participation rate in Malaysia. Government can cooperate with private sectors to develop more childcare services inside the company and the Ministry of Women, Family and Community Development Malaysia and Ministry of Education must cooperate in increasing the female labor force participation.

KEYWORDS: Female labor force participation rate, fertility rate, economic development, inflation rate, Malaysia.

I. INTRODUCTION

Labor force participation is important to economic growth and development. Labor supply in the labor market increases the revenue of labor demander and the revenue of economic. The effort has been made to raise the labor productivity and efficiency in the Seventh Malaysia Plan so that the human resource foundation can be strengthened and thus support economic growth. The government's investment in modern technology, education, and human resource development has improved labor productivity and efficiency. According to The Global Economy, Malaysia's labor force participation rate rose from 64.19% in

2018 to 64.29% in 2019. However, the labor force participation decline when economic unstable such as the 1997 Asian Financial Crisis and 2008 Global Financial Crisis because economic unstable has diminished employment opportunities, and many laid-off workers give up searching for jobs.

There are several categories to determine the labor force in order to understand more clearly what will affect labor force participation. For example, labor force by sex, states, sector, age group, ethnic, education, marital status, and so forth. From the Department of Statistics Malaysia (2020), no formal education labor force considerable decline from 835,500 laborers in 1982 to 418,000 labors in 2018 in terms of the labor force by education attainment. This result also shows that the education level of labor rises in receiving primary, secondary, and tertiary education. Besides, the labor force participation rate of males decreased significantly from 85.3% in 1982 to 80.4% in 2018 but the labor force participation rate of females increased 10.7% considerably from 44.5% to 55.2%. Females play a vital role in the labor market, but some obstacles have influenced females in participating as labor. Time and opportunities is an important reason for females to participate in the labor market. Many females spend more time at home after marriage, some females lack the opportunity to work in poorly developed countries, and some females start to work when household income is not enough to cover expenditure when the economy is unstable.

In a simple explanation, the fertility rate is defined as the average number of children per woman. The number of children per woman dropped has a relationship with female labor force participation, education, and the cost of raising children (Roser, 2014). Bloom, Canning, Fink, & Finlay (2007) specifically imply that there is the strongest effect of fertility rate on female labor

force participation rate during the ages of 20 to 39 years old. From Goldin, Claudia, & Katz. (2002) research also interpret that female labor force participation in the age group 25 to 39 years old had fallen considerably, about 10% to 15% for an additional child. As their research claims, if without birth control or family planning occurs before career, marriage, and important decisions making, females would marry and have children at a young age, thus allowing female labor force participation to get less. As Abu Bakar & Abdullah (2007) demonstrate late marriage or delaying the marriage's age among women resulted in the postponement of having the first child. Nowadays, women's education level is one of the determinants of fertility. Women seek higher education; therefore, the fertility rate is predicted to decrease, and family size decline. Hence, this academic research aims to determine the effect of fertility rate on female labor force participation in Malaysia. Due to the downward trend of female labor force participation happen in Malaysia, while searching the reason of declining female labor force participation by fertility rate, it was observed that some females are spending most of the time at home to take care of children, influenced by culture and uncivilized ideas and lack of job opportunities in low-income countries.

Economic development has a relationship with female labor force participation because when economic good in development tends to increase the female labor force participation and policy should be implemented to improve the quality of the female labor force (Verick, 2014). Council of Economic Advisers (2019) explicitly explains that female labor force participation provides a chance for the country to upgrade its size and accomplish economic growth and development. Female labor force participation increases with the GDP in the middle and high-income countries for female education rises, fertility rate declines, females work in high position rises and discrimination or inequality of gender drop. According to Altuzarra, Galvez-Galvez, & Gonzalez-Flores (2019), their research revealed that female labor mostly worked in the agriculture sector in low development countries because the level of education was not high, but it turns better when economic development grows. It can be proved by U-hypothesis exist in the relationship between economic development and female labor force participation rate which mean female labor force decline in the first stage of economic development while the increase in the middle stage and high-income stage. However, the U-hypothesis not occur in high-income countries because the female labor

force participation already reached the large or ideal amount of the female labor force. Consequently, this academic research builds up to provide additional ideas of economic development effect on female labor force participation in Malaysia. As a result of economic development and female labor force have an interrelated relationship, it was observed that female labor force participation may affected by economic development because in low develop countries, gender discrimination exist due to lack of knowledge and uncivilized ideas obstruct female to participate in labor market. On the other hand, female labor force participation could bring benefits to economic development and growth also.

Inflation can influence the price level to increase while reducing the real wage growth; therefore, a 1% increase in Consumer Price Index (CPI) lead to a negligible rise in women's labor force participation at the second stage of working age, which is more than the initial stage of women's working age. Some people believe that additional salaries for a family's income are needed when inflation comes to pass (Niemi& Lloyd, 1981). As Altuzarra, Galvez-Galvez, & Gonzalez-Flores (2019) indicate female labor force participation rate rises when economic crisis, the additional household members will enter the labor market to earn income to support household income. Accordingly, this academic research targets to interpret the effect of inflation on female labor force participation in Malaysia. With these initial ideas in mind, inflation in countries may affect female participation. It was observed that female labor force participation rise when inflation due to the price level of goods and services increase, purchasing power decline, cost of living rise and household income may not enough in low- and middle-income families cause female enters the labor market to earn income in supporting household income.

II. LITERATURE REVIEW

There are some factors that may affect the female labor participation rate. The major factors include locations, education attainment, marital status, fertility rate, gender inequality, culture and tradition, economic development, and inflation. The factor of location is distinguished as rural and urban areas. In urban areas, female labor force participation is higher than in rural areas because the job opportunities in urban areas are more extensive than in rural areas. For education attainment, females with higher educational attainment tend to enter the labor market, and they are more easily to get a job than lower education

attainment females. The high female labor force participation rate is related to higher academic qualifications. Moreover, marital status will affect the participation of the female labor force also. Marriage and childbirth dampen female's labor participation because they are spending most of the time at home doing housekeeping and taking care of the children. The fertility rate has a connection with marital status. Fertility rate declines if a female postpones the marriage age because they spend more time investing in a career first. The number of children in a family can affect females' participation in labor market also because more children make women unable to spare time to work. In addition, if a country or company has gender inequality in the labor market and the wage gap between men and women is large, it will be difficult for women to stay in the labor market, leading to a decline in the female labor force participation rate. Culture and tradition are also one of the factors leading to a decrease in the female labor participation rate. Some people still believe that "men are responsible for earning money and surviving the family, while women only need to stay at home to take care of their children". If this culture and tradition perception still widely spread, female labor force participation difficult to grow. Besides that, if a country's economic development well can increase the economic growth, GDP per capita is measured. An increase in female labor force participation can bring to the growth of annual GDP and promote economic growth. Furthermore, the occurrence of inflation leads to a higher price level of goods and services and increases the cost of living. Therefore, the low- and middle-income families may face financing problems when inflation happens.

Fertility Rate

Fertility refers to the number of children a woman gives birth over a period of time. The fertility rate is usually described as the number of children per thousand women at the child-bearing age in a year. However, the total fertility rate (TFR) is the average number of children a woman will have in her lifetime if women are subjected to the general fertility rate of child-bearing age in the population. Childbearing brings a time burden to women. Women who are married and have children spend more time at home than at work. Therefore, the participation rate of married women in the labor market is lower.

The high fertility rate leads to decline in the female labor force participation. Fertility rate of females will affect by the female's education attainment. Nowadays, females with higher

education tend to invest most of the time at work before marriage. Therefore, higher education females mostly postponement the age of marriage, the fertility rate will decline. Besides, the female labor force participation rate in rural areas is lower than in urban areas. One of the reasons is the fertility rate in rural areas higher than in urban areas due to education level of women in rural areas is lower than in urban areas, and they do not have family planning.

Economic Development (GDP per capita)

Gross Domestic Product (GDP) per capita is used to measure the level of economic development. It divides the country's GDP by its population. GDP per capita is an indicator to measure economic activities, and it can well represent the country's standard level of living. Economic development is a process to promote economic growth and improve the community's well-being. When the economy develops well, job opportunities and wealth can be created, thereby improving the community's quality of life.

Economic development is one of the keys to increase the opportunities of the female labor force. As the country's economy develops, female's abilities increase, followed by female education attainment, and female employment opportunities will also increase. The country's development has reduced the problems of gender discrimination and gender inequality in the labor market, which increases the job opportunities for females to participate in the labor market. As the country develops, females have more job opportunities, and female labor force participation will rise. At the same time, when more females enter the labor market, the economy tends to grow. Some researchers claimed that there is a U-shaped relationship between female labor force participation and economic development. In low-income countries, females basically worked in the agriculture sector. When the countries started to develop, economic activity will shift from the agriculture sector to industry, but it is more advanced to males in the industry's work. As the country's economic development continues to develop, females have more opportunities to work in the services sector or higher position jobs.

Inflation Rate

Inflation has reduced the currency value of the country as compared to the past. It means that inflation increases the price level of goods and services and reduces purchasing power. Inflation will affect the standard of living as the cost of living rises. Inflation affected the low- and middle-

income family. When the income is not enough for household expenditure, females tend to enter the labor market to earn additional income to support household income, especially married women. Most married women do not work because they spend most of their time at home to take care of their children and do housework. Females tend to work when inflation to earn income for their family; on the other hand, the contractionary monetary policy implemented to reduce inflation usually has a negative impact to female labor.

Fertility Rate on Female Labor Force Participation Rate

The increasing or decreasing of female participation in the labor market can be affected by the fertility rate. Many researchers have examined and debated the relationship between the fertility rate and female labor force participation rate in various countries in the world based on the country's development and growth. TAŞSEVEN, ALTAŞ, & ÜN (2016) analyzed the relationship between fertility rate and female labor force participation rate by using a panel data model for 32 Organization for Economic Co-operation and Development (OECD) countries in 1990 and 2013. The fertility rate has a positively and significantly effect on the female labor force participation rate. The research also stated that the fertility rate variable has a significant impact on the participation rate of females in the labor market.

According to Ahn & Mira (2002), Organization for Economic Co-operation and Development (OECD) countries showed a negative relationship between fertility rate and female labor force participation while in developing countries, fertility rate and female labor force participation showed a negative correlation before the 1980's to positive correlation after 1980's.

Zaheer & Qaiser (2016) study claimed that their results are different from the results of many previous studies on fertility rate and female labor force participation. By using the regression analysis, the result of the effect on fertility rate had an insignificant negative impact on female labor force participation rate but previous studies showed fertility rate had a significant impact on female labor force participation rate.

Besides that, another researcher also explained that female labor force participation might affect Italy and Sweden's fertility rate. Kögel (2003) analyzed that both Italy and Sweden had low fertility rates with high female labor force participation. In 1995, Italy showed a lower fertility

rate (1.2) than Sweden (1.7) but the increase of female labor force participation was not higher than Sweden. Sweden's female labor force participation rate was 75.9%, while Italy's female labor force participation rate was 43.1%.

Furthermore, higher education attainment and more job opportunities for females are the factors that reduce the fertility rate. George & Kamth (2010) stated that when education and job opportunities for both male and female rise has led to aspiring job pursuits and cause late marriages. Late marriage of spouse and increasing paternal age can cause health problems to the children, such as Down's syndrome. Therefore, late marriage will cause the fertility rate to decline, female labor force participation will increase in relative terms.

Fertility dropped when females have higher education level because they have more job opportunities in the labor market, and even if they are married, they do not give up work. By using the sampling weights for the averages of married women age from 25 to 54, from 1987 to 2011, female labor force participation increased when married female's education levels increased, the fertility rate dropped, and bring to increase household income. In addition, female not only can work in agriculture and manufacturing sectors like before, higher education attainment of females allowed them to work in white-collar services and other services sectors (Klasen & Pieters, 2015).

Moreover, a higher fertility rate will reduce female labor force participation because females spend time in child-bearing and take care of the children at home. Lim (2017) examines the effect of fertility on female labor force participation in Malaysia by using the logistic regression coefficient model and average marginal effect. The research examines the number of children who are less than six years old and more than six years old in a family reduces the possibility of female labor force participation. Females face a challenge in balancing between career and family nowadays.

The fertility rate affects the decline of the female labor force, not only by marital status, the number of children, and education level, but also by cultural factors. Therefore, the impact of fertility rates on female participation in the labor market can be traced back to the factors of marriage and culture or tradition. Egyptian culture and traditions encourage high fertility rates, and the number of children affects the female's decision to join the labor market or resign. In Egyptian culture, married women in Egypt bear full responsibility for household activities while the husband is responsible for working outside and earning money for the family (Hosney & Hassan, 2016).

Apart from that, the fertility rate can be reduced by implementing family planning and using birth control pills, thus increasing the female labor participation rate. Goldin, Claudia, & Katz (2002) interpret birth control pills have changed females' careers and marriage choices. Due to time-intensive, females are difficult to invest in both career and child-care responsibilities in the earlier stage of marriage; therefore, the pills can eliminate the pregnancy risks and encourage females to invest in a career. However, the pills can control the fertility rate or child-bearing of married spouses but young and unmarried females also. Therefore, birth control and family planning are important before marriage and after marriage in order to plan the number of children and career opportunities.

Economic Development on Female Labor Force Participation Rate

The relationship between economic development and female labor force participation is more complicated than what we know in books and other relevant studies (Verick, 2014). This is because economic development is an in-depth and extensive topic involving many variables. The economic development topics explained in the book are only part of the overall economic development. It is essential to have the more practical experience and understand the real-time development of the countries. Therefore, economic development and female labor force participation include many variables also, and they are interrelated. If the development of the country's economy is poor, females may lack opportunities to enter the labor market. On the other hand, if female's participation rate in the labor market increases, it can promote the country's economic development.

Many studies discuss the U-shaped relationship between economic development and female labor force participation. Goldin (1994) revealed that the U-shaped relationship occurs between economic development and female labor force participation. When the country's economy develops, more females participate in white-collar service sectors than previous (agriculture sectors). Female labor force participation and economic development stated that the level of education improvement leads to the growth of employment in services sectors allowed females to enter the labor market, increasing females' earning ability and reducing the social stigma on females' job.

In addition, a study from Fatima & Sultana (2009) proved that a U-shaped relationship exists in Pakistan's economic development and female labor force participation. The study results

showed that the growth of economic development provides many job opportunities for females and encourages females to enter the labor market. Females can use the advance of these opportunities to upgrade their education level. Female's higher education level can improve their knowledge in other sectors instead of working in the agricultural sector or home-based production as before.

According to Lechman & Kaur (2015), the study examined the U-shaped relationship between economic growth and female labor force participation in 162 countries from 1990 until 2012. A positive U-shaped relationship exists between economic growth and female labor force participation in high-income and middle-high-income countries. However, the inverted U-shaped relationship exists between economic growth and female labor force participation in low-income countries, showing a positive relationship between the female labor force and GDP per capita.

However, the research taken by Lahoti & Swaminathan (2013) stated that there is no U-shaped relationship between economic development and female labor force participation in India. Their study showed an inverted U-shaped relationship between economic development and female labor force participation in India using the Ordinary Least Squares (OLS) regression model. The researcher claimed that India's overall economic growth is not driven by the agriculture and manufacturing sectors. The services sector is the main economic growth factor, but most females do not possess the high skills needed in the service sector.

Apart from using GDP per capita as a measurement of economic development, a previous study has used the capital-to-labor ratio to examine the relationship between economic development and female labor force participation. Choudhry & Elhorst (2018) proved that U-shaped relationships occur in economic development and female labor force using capital-to-labor ratios. U-shaped relationships exist, indicating the possibility of narrowing the vast gap between male and female participation in more female work in services sectors, gaining higher education level, declining fertility rate, and increasing wages.

On the other hand, females' participation in the labor market is essential in economic activities and development; therefore, there should be no discrimination when the economy is developing. The study conducted by Dogan & Akyuz (2017) shared a more in-depth view about low female labor force participation will slow down economic growth and development because female labor participation is important in

promoting national growth and development. There should be no gender inequality in participating as a labor force because female and male laborers are equally important to the country's economic growth and development.

A country's GDP can measure economic development, and females' participation in the labor market can accelerate economic growth. Malaysia's report from the Ministry of Women, Family and Community Development (2014) pointed out that greater participation in the female labor force is also believed to help build economic growth capacity. The increasing participation of females in the labor market could be interpreted in the growing GDP, thus promoting Malaysia's economic growth. United Nations Development Programme (UNDP) estimated that if females' participation rate in the labor force rises to 70% would encourage Malaysia's GDP to increase by 2.9%.

Lastly, the country may lose opportunities to raise GDP per capita and promote economic development if there is less participation of females in the labor market. The increase in female labor force participation may partially offset the negative economic impact on the aging population. Involvement of females in the labor market can bolster more investment in child health and education, lower down the country's poverty, improve well-being, and boost economic development in the long-term (Pignatti, 2016).

Inflation on Female Labor Force Participation Rate

Many families will face the financial problem when economic crises, especially low- and middle-income families. For example, inflation will increase the price level of goods and services, purchasing power drops, cost of living rises, and low- and middle-income groups may face financial problems. When inflation happens, low-income families who only rely on one source of income or husband income will suffer more serious financial difficulties. Therefore, female labor force participation rises in inflation if the wife decides to enter the labor market to earn additional income to support the household income.

Consumer Price Index (CPI) is one of the measurements of the country's inflation. According to Niemi & Lloyd (1981) showed a positive and significant effect on the young female labor force. Female labor force participation in the aged group of 25 to 54 years old is affected by CPI. However, the negative effect of inflation happens on the females who are above 54 years old. The reason

that affects female labor force participation may be caused by price level and real wages. If inflation continues in the future, this is likely to be one of the factors leading to shifting from a one-earner to a two-earner family. The wife may enter the labor market to earn income to improve their living standards.

A report issued by the Khazanah Research Institute (2018) explained the remaining household income after calculating inflation. Households with a household income of less than RM2, 000 used 94.8% of their income on household consumption. After calculating inflation, the household's remaining income is RM76 in 2016, less than RM124 in 2014 in the family with a household income of less than RM2, 000. Therefore, households with an income less than RM2, 000 may be very vulnerable to economic crisis or economic shock. In addition, Verick (2014) stated that when economic shocks or economic crisis, women require to engage in the labor market in order to stabilize household consumption and support household income.

Furthermore, increasing female's participation in the labor market may reduce the impact of inflation on the country, thereby benefiting the country's economic recovery. Braunstein & Heintz (2005) claims that lower unit labor costs and growth in women labor force have significant connect with inflation for the reason that increase in women labor force with lower labor costs could diminish the effect of country's inflation pressure when women worked in competitive sectors. Further explanation from their research demonstrate the downward trend of female to male employment ratio below the long-run trend when contractionary inflation occur but upward trend of female to male employment ratio when expansionary inflation.

Inflation may cause a negative impact on many people, including the female labor force also. Therefore, there are some policies implement to reduce the effect of inflation. Recurring economic shock and crisis related to financial liberalization already prompted females to enter the labor market and usually prompt them to engage in precarious work. Besides, inflation reduction may negatively affect the female labor force. The percentage of contract female workers to lose a job is higher than male workers. However, in the context of increased employment opportunities during the period of reduced inflation, females do not obtain employment opportunities faster than males (Razavi, et.al. 2012).

III. METHODOLOGY

Research Framework

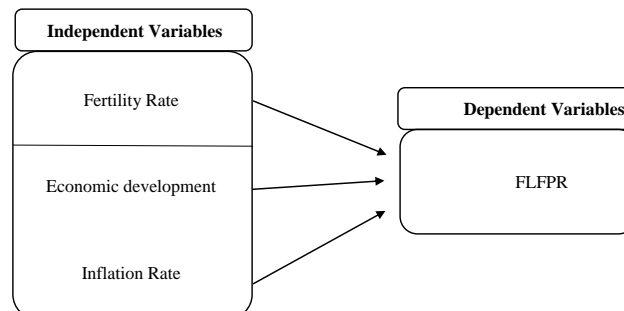


Figure 1: Research Framework of Female Labor Force Participation Rate

Female Labor Force Participation Rate

Females are important to the economics of countries. Females responsibilities are not only to take care of children at home, but females are also very capable of working. However, some factors affect the participation of the female labor force. For example, age, marriage status, husband's wages, fertility rate, education level, culture and tradition, economic development, inflation and so forth. Therefore, this academic examined the effect of the fertility rate, economic development, and inflation rate on female labor force participation rate. Female labor force participation rate used percentage as the measurement to examine the relationship with other variables.

Fertility Rate

The fertility rate is one of the factors that affect the participation of the female labor force. If the fertility rate is high due to culture and tradition, female labor force participation will drop. However, if the fertility rate drop due to higher education, more job opportunities, and family planning implemented, females' participation to enter the labor market rise. Therefore, this academic used fertility rate as the independent variable to examine the effect of fertility rate on female labor force participation. The percentage is used as the measurement to examine the relationship between female labor force participation rate and fertility rate.

Economic Development

Economic development is one of the factors that affect the participation of the female labor force. When a country's economic development is poor, females' opportunities to study more education and enter the labor market

are less. In addition, economic development and the female labor force have an interrelated relationship. As the economy develops, females have more opportunities to work; thus, when more females participate in the labor market, it could also boost economic development. Therefore, this academic used economic development as the independent variable to examine economic development's effect on the female labor force participation rate. GDP per capita in percentage used as the measurement to examine the relationship between the female labor force participation rate and economic development.

Inflation Rate

Inflation rate is one of the factors that affect the participation of the female labor force. Inflation happens to cause the price level of goods and services to rise, purchasing power to drop, and higher living costs. There are many low- and middle- income household will suffer financial problem when inflation. Households that only rely on one-earner income or husband income may face trouble; thus, females or wives decide to work and earn income to support the household income. Therefore, this academic used inflation rate as the independent variable to examine the effect of inflation rate on female labor force participation rate. In this academic research, the inflation rate is used percentage as the measurement.

Data Collection

This study used secondary data to examine factors that affect the female labor force participation rate in Malaysia. The data is collected from the Department of Statistics Malaysia (2020) and The World Bank. Table 1 shows the variables, measurement, and source of data.

Table1: Variables and Measurements

Variables	Measurements
1. FLFPR	Percentage
2. Fertility Rate	Percentage
3. Economic Development (GDP per capita)	Percentage
4. Inflation Rate	Percentage

Source: Department of Statistics Malaysia (2020) & The World Bank

Methods of Data Analysis

The objective of this study is to examine the factors that affect female labor force participation in Malaysia. There are several method of data analysis used in this study such as regression analysis, autocorrelation (Durbin-Watson), multicollinearity(Pearson Correlation Coefficients).

Regression Analysis

A multi regression model was used in this study. A statistical measurement, R-squared, is used to gauge the ratio of variation of the dependent variable that can be interpreted by more independent variables in the regression model. The value of R^2 is between zero and one. The lower R^2 value is revealed that there is a weak impact of independent variables on the dependent variable, while the higher R^2 value is revealed that the strong weak impact of independent variables to the dependent variable. Beta coefficients describe the degree of change in the dependent variable for every one unit of change in the independent variables.

Autocorrelation

Autocorrelation is defined as the correlation's degree in different observations in the data among the same variables' values. Autocorrelation means that there is a relationship between the error in the first observation (μ_t) and the error in the previous observation (μ_{t-1}) in the econometric model. The error term (μ_t) at time t should not depend on the error term at the previous time (μ_j), which is at the time t-1. If there is a correlation relationship between the errors, the model fails to meet the CLRM assumption, leading

to autocorrelation problems. Durbin & Watson (1950) have examined the error terms of the regression model for serial correlation. Durbin-Watson test is a method that uses to test autocorrelation. The value of Durbin-Watson is between zero and four. In the time-series data, there is no autocorrelation detected if the value is two. Positive autocorrelation is detected when the value is from zero to less than two and negative autocorrelation is detected when the value is from more than two to four.

Multicollinearity

Multicollinearity means that there is a linear or almost linear relationship between independent variables in an econometric model. Multicollinearity test is use to determine whether the independent variables are correlated with one another (Mendenhall & Sincich, 2012). Multicollinearity may affect the accuracy of the results. High correlation means serious multicollinearity between independent variables may raise the possibility of errors when calculating for standard errors, β estimates, and so on. In addition, the results of regression may cause misleading and confusion also. The independent variable (X_i) should not depend on other independent variables (X_j). If there is a correlation relationship between the independent variables (X_i) and (X_j), the model fails to meet the CLRM assumption and this can lead to the multicollinearity problems. Multicollinearity exists when the degree of relationship between independent variables is one (Perfect Multicollinearity) or less than one (Imperfect Multicollinearity).

IV. DATA ANALYSIS AND FINDINGS

Table 2: Descriptive Data (After Adjustment of 'log-linear')

	Female Labor Force Participation Rate (%)	Fertility Rate (%)	Economic Development (GDP per capita) (%)	Inflation Rate (%)
N	32	32	32	32
Mean	48.1433	0.96998	9.72114	2.6509
Min	44.4	0.69315	8.48343	0.29
Max	55.2	1.30833	10.7077	5.44
Std. Dev.	3.2211	0.22289	0.65956	1.2972

Table 2 above shows the variables' descriptive data, which contained n, mean, minimum, maximum, and standard deviation. Based on the table, the mean of female labor force participation rate (LFPR) in the 32 years' data set is 48.1% per year. The minimum value and maximum value of female labor force participation rate are 44.4% in 1998 and 55.2% in 2018. The female labor force participation rate shows a low standard deviation, which is 3.22, which means that the value is far from the mean and has higher variability in the data set.

By using 32 years' data set, the mean for fertility rate (FR) is 0.97%. The minimum value and maximum value of the fertility rate are 0.69% in 2018 and 1.31% in 1987. The fertility rate shows a low standard deviation, which is 0.22, which means that the value is close to the mean and has lower volatility in the data set. Besides, the mean for economic development (ED) measured by GDP per capita is 9.72%. The minimum value and maximum value of economic development are 8.48% in 1987 and 10.71% in 2018. Economic development shows a high standard deviation is 0.56, which means that the value is close to the mean and has lower volatility in the data set. Next, the mean for the inflation rate (INF) is 2.65%. The minimum value and maximum value of inflation are 0.29% in 1987 and 5.44% in 2008. The inflation rate shows a low standard deviation which is 1.2972, which means that the value is close to mean and has lower volatility in the data set.

Empirical Data Analysis and Findings

Regression Analysis

The least-squares estimates β parameters are $\beta_0 = -49.10045$, $\beta_1 = 17.34893$, $\beta_2 = 8.45951$ and $\beta_3 = -0.74243$. The estimation of the least-squares equation for the female labor force participation in Malaysia are as follow:

$$FLPR_t = \beta_0 + \beta_1 FR + \beta_2 ED + \beta_3 INF + \epsilon_t$$

$$= -49.1005 + 17.3489FR + 8.4595ED - 0.7424INF$$

$$(-1.17) \quad (1.7) \quad (2.52) \quad (-1.83) \quad **$$

** Significant at the significance level of 5%

* Significant at the significance level of 10%

The value of the sum of the squared error (SSE) is 165.14, while mean square error (MSE) is 6.35, which have illustrated in the regression analysis test also. The higher value of R^2 , the good fit for the model. R^2 is 0.4512 and this indicates that 45.12% change in the dependent variable female labor force participation rate ($FLPR_t$) can be explained by the independent variables; fertility rate (FR), economic development (ED), and inflation rate (INF). Other independent variables describe the remaining 54.88% except for $FLPR_t$, ED, and INF. The adjusted R^2 will change the result of statistics depend on the number of independent variables because it offsets the additional independent variables or parameters. The adjusted R^2 can be negative or infinity, and it is less than R^2 . The adjusted R^2 is 0.3878, this indicates that 38.78% change in the dependent variable female labor force participation rate can be explained by the independent variables fertility rate, economic development, and inflation rate after taking into account the loss of degrees of freedom (df), while other independent variables describe the remaining of 61.22% except for $FLPR_t$, ED, and INF.

$\beta_0 = -49.1005$, it showed the autonomous female labor force participation rate is -49.10% when fertility rate ($FLPR_t$), economic development (ED), and inflation rate (INF) are equal to zero. Assuming other independent variables are constant in the model, β_1 measures the change in Y_t for every one-unit rise in X_1 . Regarding β_2 and β_3 , the same concept can be used as β_1 . $\beta_1 = 17.3489$, it can be estimated the female labor force participation

rate to rise 17.35% for every 1% fertility rate (FR) rises when all other independent variables are fixed. $\beta_2 = 8.4595$, it can be estimated the female labor force participation rate to rise 8.46% for every 1% economic development (ED) increases when all other independent variables are fixed. $\beta_3 = -0.74$, it can be estimated the female labor force participation rate to drop 0.74% for 1% inflation rate (INF) rises when all other independent variables are fixed.

The t value is calculated by dividing the parameter estimate by its standard error, the same calculation for other variables. The t statistic (t_s) showing β_1, β_2 , and β_3 are significant at the significance level of 5% and 10%. Null hypothesis (H_n) is rejected if t statistic (t_s) greater than t critical (t_c) and alternate hypothesis is accepted (H_a). The t statistic (t_s) for β_1 of 1.7 is larger than the t critical (t_c) of 1.315, null hypothesis (H_n) is rejected, meaning that the fertility rate's variable significance at the significance level of 10%. The t statistic (t_s) for β_2 of 2.52 is larger than the t critical (t_c) of 1.706, null hypothesis (H_n) is rejected, meaning that the economic development variable significance at the significance level of 5%. The t statistic (t_s) for β_3 of 1.83 is larger than the t critical (t_c) of 1.706, null hypothesis (H_n) is rejected, meaning that the inflation variable significance at the significance level of 5%.

F-value calculates by dividing the mean square model by its mean square error. If F statistic (F_s) value greater than F critical (F_c), reject null hypothesis (H_n) that there are no parameters affects the dependent variable at the significance level of 5% and accept alternate hypothesis (H_a) that there are at least one parameters affects the dependent

variable at the significance level of 5%. F critical (F_c) value is 2.98. The F statistic (F_s) value showed in the SAS result is 7.12. Thus, the F statistic (F_s) of 7.12 is greater than F critical (F_c) of 2.98, null hypothesis (H_n) is rejected, showing that there is at least one parameter affects the dependent variable at the significance level of 5%.

Autocorrelation test

Durbin-Watson test is carried out to determine whether the multiple regression's residuals are autocorrelated positively. General hypotheses are built:

- $H_n: \rho = 0$ (no autocorrelation)
- $H_a: \rho \neq 0$ (have autocorrelation)

The result of the Durbin-Watson d test for autocorrelation showed DW-d is 0.342. Autocorrelation tested at 1% significance level, with the number of observations (n) is 30, the number of parameter (k) is 4. Based on the table of the Durbin-Watson d, Durbin Lower (d_L) = 1.006 and Durbin Upper (d_U) = 1.421. Therefore, Durbin Lower (d_L) and Durbin Upper (d_U) are used to calculate $4 - d_L$ and $4 - d_U$. By using $d_L = 1.006$ and $d_U = 1.421$, calculate as:

$$4 - d_L = 4 - 1.006 = 2.994$$

$$4 - d_U = 4 - 1.421 = 2.579$$

Multicollinearity test

The estimation results of Pearson correlation coefficients ($r_{x_i x_j}$) indicate that not all correlation coefficients (r) are lower than coefficient of determination (R^2) 0.4512. Whereby,

$$r_{x_1 x_2} = |-0.9735| > R^2 = 0.4512$$

$$r_{x_2 x_3} = |-0.1582| < R^2 = 0.4512$$

$$r_{x_3 x_1} = |0.2564| < R^2 = 0.4512$$

Table 3: Pearson Correlation Coefficients (Partial)

Pearson Correlation Coefficients				
	Yt	X1	X2	X3
Yt	1.00000	-0.54876	0.59938	-0.22561
FLFPR		0.0017	0.0005	0.2306
X1	-0.54876	1.00000	-0.97349	0.25642
Fertility Rate		0.0017	<.0001	0.1566
X2	0.59938	-0.97349	1.00000	-0.15816
Economic Development		0.0005	<.0001	0.3873
X3	-0.22561	0.25642	-0.15816	1.00000

Pearson Correlation Coefficients

	Yt	X1	X2	X3
Inflation Rate	0.2306	0.1566	0.3873	

According to table 3, imperfect multicollinearity exists between fertility rate, and economic development because $r_{x_1x_2}$ is -0.9735 , and it is less than 1. Fertility rate (FR), and economic development (ED) also shows serious multicollinearity because $r_{x_1x_2} = 0.9735$ is more than 0.90. The $r_{x_2x_3}$ is -0.1582 and it is less than 1, imperfect multicollinearity exists between economic development, and inflation rate. Economic development (ED), and inflation rate (INF) do not have serious multicollinearity because $r_{x_2x_3} = 0.1582$ is less than 0.90. The $r_{x_3x_1}$ is 0.2564 and it is less than 1, imperfect multicollinearity exists between economic development, and fertility rate. Economic development (ED), and fertility rate (FR) do not have serious multicollinearity because $r_{x_3x_1} = 0.2564$ is less than 0.90.

4.1 Analysis of Results

Results obtained show that fertility rate (FR) is the most important variable affecting the female labor force participation rate. It can be explained as for every 1% increase in fertility rate, the female labor force participation rate will increase by 17.35%, assuming other independent variables is fixed. This finding is in line with the result obtained by TAŞSEVEN, ALTAŞ and ÜN (2016).

The second important variable affecting the female labor force participation rate is economic development (ED). It can be explained as for every 1% increase in economic development (GDP per capita), the female labor force participation rate will increase by 8.46%, assuming other independent variables is fixed. Study done by Lechman & Kaur (2015) stated that the U-shaped relationship between economic growth and female labor force participation existed and showed a positive relationship between the female labor force and GDP per capita in some low-income countries. In addition, the Ministry of Women, Family and Community Development (2014) of Malaysia revealed the increasing female labor force participation interpreted by the growth of Malaysia's GDP.

The last important variable affecting the female labor force participation rate is inflation rate (INF). It can be explained as for every 1% increase in inflation rate, the female labor force

participation rate will decrease by 0.74%, assuming other independent variables is fixed. Razavi, et. al. (2012), in their study proved that the policies implemented such as financial liberalization might negatively affect the female labor force when the government tries to solve the problem of inflation. Inflation reduction causes the contract' female laborers to lose the job, which is higher than male laborers. Furthermore, previous study by Braunstein & Heintz (2005) pointed out when contractionary inflation, the downward trend of female to male employment ratio below the long-run trend. However, when expansionary inflation, the female to male employment ratio showed an upward trend.

V. CONCLUSION

In conclusion, variables of fertility rate, economic development, and inflation rate are factors that are significantly influence the female labor force participation rate in Malaysia. As stated in the Eleventh Malaysia Plan 2016-2020 (2015), the role of women is not only creating happiness and taking care of their family but they also play an important role in socio-economic development. The continuously policy that implemented by government to ensure 30% women labor force able to participate in public and private sectors and have the power in decision making and management. From the survey conducted by the National Population and Family Development Board (2016) indicated that 42.4% of women have stopped working due to the reason of childcare problem (32.4%). In addition, 18.7% working females faced the difficulty in balancing career and family. Therefore, to increase female labor force participation in Malaysia, government support and training program, maternity leave, flexible work arrangement are the policies need to be implemented. (Lim, 2018). Those policies are important to reduce some burden of females, especially married women with children and encourage more females to re-enter the labor market.

If the fertility rate could not reduce as much as possible with the implementation of family planning and females want to balance between taking care of child and work, the government should take action to increase

childcare services and fertilities. According to Ministry of Finance Malaysia (2019) in the Budget 2020, government is taking more initiative to strengthen the workplace environment for women and parents. In 2019, RM10 million was distributed to the development of early childhood care facilities in government buildings. A total of 66 new TASKAs were built through the programme. In 2020 the Government will allocate an extra RM30 million to include further TASKAs, concentrating on hospitals and schools. On the other hand, Ministry of Finance Malaysia (2020) in Budget 2021, government will distribute RM 30 million in providing more childcare services or TASKA in government building, mainly in hospitals in order to reduce the burden of frontliners and working women by providing childcare services.

The economic development should improve so that the female labor force may have more job opportunities but not only work in home-based production or agriculture sector This is because when economic development rises, gender inequality will drop, more females are receiving high education, which can increase females' chances of participating in the labor market. According to Fabrizio, Gurara, & Kolovich (2020) revealed that fiscal policy was implemented to promote economic development by increasing gender equality. In order to create more economic or job opportunities for females, improve development and reduce poverty and gender inequality is essential, for example, invest in infrastructure and education, develop better sanitation facilities, and so forth. The fiscal policy aimed to reduce the gender gap in education, provide women with job opportunities, build infrastructure, and ensure women have the opportunity to engage in paid work.

According to OECD (2019), inflation in Malaysia has stable, but inflation still increasing the price of goods will lead to an increase in the cost of livings, which can raise the burden of low-income households. The government has introduced many programs and policies to handle and reduce the issue of increasing living costs. For example, boosting entrepreneurship, increasing employability, price controls, improving productivity, and so forth for low-income households. In Budget 2020, the government launched the Malaysian@Work programme targeted to give preferable employment opportunities for young and women. Women@Work programme purposed to create 33,000 job opportunities per year for women who have stopped working (aged between 30-50 years

old) at least one year or more than one year. The wage incentive of RM500 per month will give for returning women workers for two years. Women's current income tax exemption will be extended from 2020 until 2023 for women who re-enter to work (Ministry of Finance Malaysia 2019).

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