

**WOMEN LABOR FORCE PARTICIPATION IN  
MALAYSIAN LABOR MARKET**

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**WOMEN LABOR FORCE PARTICIPATION IN MALAYSIAN LABOR  
MARKET**

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**By**

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## **ABSTRACT**

From the early 1980s, the participation of women in the labor market is less than 50 percent compared to men. The women's labor force participation rate is an important factor that can influence both the present and future well being of the economy. Independent variables that has been selected are education, fertility rate, unemployment rate, population of women, foreign workers and as well as GDP. This study used time series data of 1982 to 2011. The objective of this study are i) to investigate the trends of Women Labor Force Participation Rate (WLFPR) in Malaysia and compared it with the selected variables. ii) to study the influence of the six macroeconomics variables on WLFPR and iii) to examine the relationship between Total Fertility Rate (TFR) and WLFPR. The results show that only education and population have significant influence on WLFPR. The Granger Causality test shows that there is no direction of causality between WLFPR and TFR. The implementation of the New Economic Policy (NEP) in Malaysia put education as an important tool in the fight against poverty and restructuring of society.

## **ABSTRAK**

Bermula awal tahun 1980an, kadar penyertaan golongan wanita ke dalam pasaran buruh (WLFPR) adalah kurang daripada 50 peratus berbanding dengan golongan lelaki. Kadar penyertaan tenaga buruh wanita adalah faktor penting yang boleh mempengaruhi kesejahteraan ekonomi masa kini dan juga masa akan datang. Pemboleh ubah tidak bersandar yang dipilih adalah pendidikan, kadar kesuburan (TFR), kadar pengangguran, populasi wanita, kadar kemasukan pekerja asing dan juga keluaran dalam negara kasar (GDP). Kajian ini menggunakan data siri masa tahun 1982 hingga 2011. Objektif kajian adalah: i) untuk menyiasat trend kadar penyertaan wanita dalam pasaran buruh di Malaysia dan perbandingan dengan pemboleh ubah yang dipilih. ii) mengkaji pengaruh keenam-enam pembolehubah makroekonomi ke arah kadar penyertaan wanita dalam pasaran buruh dan iii) untuk melihat hubungan antara kadar kesuburan dan kadar penyertaan wanita dalam pasaran buruh. Keputusan menunjukkan bahawa hanya pendidikan dan penduduk mempunyai hubungan yang signifikan kepada kadar penyertaan wanita dalam pasaran buruh. Ujian Granger sebab-akibat menunjukkan bahawa tidak ada arah sebab-akibat antara kadar penyertaan wanita dalam pasaran buruh dan kadar kesuburan. Pelaksanaan Dasar Ekonomi Baru (DEB) di Malaysia meletakkan pendidikan sebagai alat yang penting dalam memerangi kemiskinan dan menyusun semula masyarakat.

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## LIST OF ABBREVIATIONS

CBO	-	Congressional Budget Office
DOF	-	Department Of Statistic
DV	-	Dependent Variable
EPU	-	Economics Planning Unit
GDP	-	Gross Domestic Product
HAWA	-	Women Affairs Unit
ILO	-	International Labor Organization
IV	-	Independent Variable
LDCs	-	Less Development Countries
MOHA	-	Ministry Of Home Affairs
MOHE	-	Ministry Of Higher Education
MOHR	-	Ministry Of Human Resources
MLRM	-	Multiple Linear Regression Model
NEP	-	New Economic Policy
NPW	-	National Policy On Women
NGO	-	Non-Government Organization
OLS	-	Ordinary Least Square
SPSS	-	Statistical Packages for Social Sciences
TFR	-	Total Fertility Rate
VAR	-	Vector Autoregressive Regression
WLFPR	-	Women Labor Force Participation Rate

## **CHAPTER 1**

### **INTRODUCTION**

#### **1.1 Introduction**

Women participation in labor market plays an important role in Malaysian economic growth. Hence, it is important for Malaysian's government to implement the correct policy to attract women to enter the labor market. Section 1.2 is discussing about the overview of women participation in labor market. Section 1.3 about the background of study. Women participation in labor market was influenced by several macroeconomic factors. Section 1.4 about the problem statement. Participation of women in the employment sector in this country is still low because the rate is below to 50 percent compared with others countries. Section 1.5 about the objective of study where is the general and specific objective. Scope of this study is focusing on WLFPR with the selected variables and it was discussed in Section 1.6. The significance of the study is can provide the guidance to governments and non-government organization to promote women increase participation in labor market where is discussed in Section 1.7. The last section is about organization of the study.

## **1.2 Overview of Women Labor Force Participation in Labor Market**

Work defines the conditions of human existence in many ways. It may be the case that this is even truer for women than for men, because the responsibility for social reproduction is largely devolved on women. In most societies, the vast majority of women are inevitably involved in some kind of productive or reproductive activity. Despite this, in mainstream discussion, the importance of women's work generally receives marginal treatment simply because so much of the work regularly performed is "invisible" in terms of market criteria or even in terms of socially dominant perceptions of what constitutes "work". This obviously matters, because it leads to the social underestimation of women's productive contribution. Even more importantly, as a result, inadequate attention is typically devoted to the conditions of women's work and their implications for the general material conditions and well-being of women (Ghosh, 2005)

Women labor force participation rate (WLFPR) refers to the number of people at work, the unemployed and those who are seeking work, as a proportion of a specified baseline population (Marshall, 1998). Rates may vary according to how the base group is defined, for example male, female, the total adult population over 16 years, or the working age population (16-65 years). Difficulties arise over female participation rates, especially in Third World Countries because of the ambiguity in the definition of women's work.

The women's labor force participation rate is an important factor that can influence the present and future well being of the economy. Towards the end of the 20th century, the women's labor force participation rate greatly increased as the result of an increasing number of women entering the workforce. Economic theory claims that a major cause of the increase in women's participation in the workforce is the result of contraceptive technology, age adjustment, and majority laws. Women are able to invest more time into a career and still make time for her family, whereas in previous centuries they put the majority of their time and effort into raising a family (Sackey,2005).

The rapid development of the economy has forced women to change along with the nation development. Now, women are plays an important role where is they hold all responsibilities such as a daughter, wife and mother. Even so, women need to act quickly in the face of competition with men, especially in the workplace. Besides that, women are decided to work is influence by the family life cycle where women tend to make different decisions during different stages of the family life cycle. Empirical studies find by Waite (1980), that due to the incompatibility between family and market work during the childrearing years, this family life cycle factors often have a strong and negative effect on WLFPR.

In Malaysia, women participation in labor market was still low which is only 47.9% compared to men 79.8% in 2011 (Department of Statistics,2012). This rate of women participation is below 50% since the year of 1982 until 2011. Since 1982, the female participation rate shows there is slightly fluctuates until to year 2011. Women participation in the employment sector gives a very large impact where it is not only in terms of shaping the culture of the organization and improve the gender imbalance of power and authority in the workplace but also in the realization of the goals and mission of the organization, improve efficiency, address the problem of poor management, planning management more effective and others.

Besides that, the challenges of growth, job creation, and inclusion are closely intertwined. While growth and stability are necessary to give women the opportunities they need, women's participation in the labor market is also a part of the growth and stability equation. In particular, in rapidly aging economies, higher women labor force participation can boost growth by mitigating the impact of a shrinking workforce. Better opportunities for women can also contribute to broader economic development in developing economies, for instance through higher levels of school enrollment for girls.

Figure 1.1 shows the rates of male and female participation in the labor market from 2000 to 2011. Figure clearly shows that the participation rate among men is higher than the participation of women in Malaysian labor market.

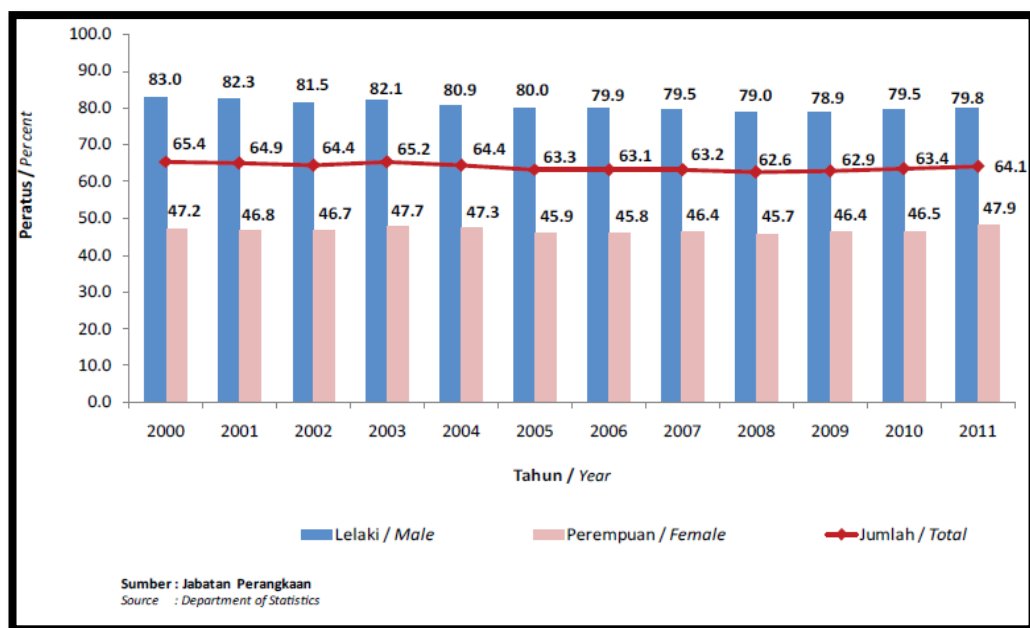


Figure 1.1: Labor Force Participation Rate By Sex, 2000-2011

### 1.3 Background of study

Nowadays, the participation of women in labor market lower than men's since the 1980s. Why some women choose to stay in the labor market, while some choose to remain outside the labor market? What are the factors that influence women's decision to participate in the labor market? These two issues have been pointed out by many researchers in other countries before.

Women participation in labor market influence by several macro factors, namely the total unemployment rate, Gross Domestic Product (DP), fertility rate, women population rate, education and also the total entry of foreign worker in Malaysian labor market.

#### **1.4 Problem Statement**

In general, studies on gender conducted in most of the universities for the 2001-2005 period were more focused on the questions of women who typically support a variety of important roles. Therefore, questions about the role and challenges of women in performing various responsibilities in addition to the men who are family's main breadwinner, often become the main discussion in most studies. This study will look at the issue of women participation from the perspectives of macroeconomics variables.

According to Ministry of Home Affairs (1997), in economic terms, the purpose of women enter to the workforce is to help increase the household income. While, in terms of the economy, the rapid development has opened up many job opportunities for women, and indirectly women can help increase the national income and enhance personal performance. In social terms, interest has prompted women to be in the employment sector. This study will investigate the trend of WLFPR and compare it with the selected

macroeconomics variables, namely education, TFR, GDP, unemployment rate, population and foreign worker.

Participation of women in the employment sector in this country is still low because the rate is below to 50 percent compared with others countries. Actually, participation of women in the labor force contributes to economic growth and productivity. However, with the presence of a child, a married woman who decides to go to work will have to think about the childcare for her child. As we are all aware, the difficulty of finding a suitable childcare and the high cost of childcare will affect the decision of women to participate in the labor market. Hence, various methods done to increase the participation rate in the employment sector. The government will continue to encourage women especially housewives together join the employment sector to reduce dependence on foreign labor in addition to increase their income. Thus, this study will identify the real macroeconomics determinants of WLFPR in Malaysia.

Female employment might lead to lower fertility since working reduces a woman's available time, and as raising children is time intensive, employed women might choose to have fewer children. Certainly cities like Hong Kong and Shanghai exhibit both relatively high women labor force participation rate and extremely low fertility rates. Female employment could also lead to higher fertility by boosting family income, thereby making the expenses of childrearing more affordable (Hussain 1994).

According to Porter (2009), as mortality declines and markets for both human and financial capital developed, fewer children are required to obtain these benefits for the household. Also, as families and especially women develop their human capital, and as demand for skilled labor increases with development, wages rise and so does the opportunity cost of time, including the time required to raise children. Fertility falls as women's education and independence increase. In order to increase human capital, women must participate in the labor market to avoid high migration of foreign labor in the country. However, when women labor force participation rate increases, fertility rate falls, population rate decreases, and this will effect the development of the country. Therefore, this study aims to clarify the direction of the relationship between TFR and WLFPR in this country.

## **1.5 Objective**

The objective of this study can be divided into general and specific objectives.

### **1.5.1 General Objective**

This study attempt to examine the women labor force participation rate in Malaysian labor market with the determinants; unemployment rate, gross domestic product (GDP), total fertility rate (TFR), education, population rate of women and total of foreign worker.

### **1.5.2 Specific Objective**

- i) To present the trend of WLFPR from 1982 – 2011 with unemployment rate, gross domestic product (GDP), total fertility rate (TFR), education, population rate and foreign worker.
- ii) To examine the influence of unemployment rate, gross domestic product (GDP), total fertility rate (TFR), education, population rate and foreign worker towards WLFPR.
- iii) To examine the causal relationship between TFR and WLFPR

### **1.6 Scope of the study**

This study focuses on whether unemployment rate, GDP, total fertility TFR, education, population rate of women and total of foreign worker in Malaysian labor market influences WLFPR. This study used the time series data for 30 year which is from 1982 until 2011.

Besides, this study only focused on women participation in Malaysian labor market only. The type of data used in the study are secondary data which was collected from various sources including the Department of Statistic, World Bank Data, Ministry Of Human Resource, Ministry of Women, Family and Community, International Labor Organization and also Economic Planning Unit.

### **1.7 Significance Of Study**

The main purpose of this study is to examine the WLFPR with the six macroeconomic factors that influence participation rate of women in Malaysia. While most previous study only study the relationship of WLFPR with the fertility rate and education but this study is different. Other than to see the relationship WLFPR with TFR, there are four more factors included to examine the WLFPR .

The findings of this study are intended to provide guidance to the governments and also non-government organization to promote women increase participation in labor market. The government should be able to identify the correct policy that should be implemented to promote the economic growth. Each policy or strategy must be suitable and efficient in facing problems related to labor force participation in labor market. The findings of study provide more knowledge to societies especially to the women in the labor market.

## **1.8 Organization of the study**

This study consists of six chapters. Chapter One is a simple introduction about the women participation in Malaysian labor market. While the second chapter in this paper is provides a review of the existing literatures those are relevant to the women labor force participation in labor market. In addition, in this chapter there will be the theoretical and empirical review. Chapter Three presents the methodology of the study which presents the research framework, model specification, justification of each variables and data sources. While Chapter Four presents the trend of WLFPR with each variables. Chapter Five present the findings of the research where is shows all the analysis of data. Finally, Chapter Six reveals the conclusion and also the suggestion.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter shows the explanation and conclusion of the research where is carried out by the others as well as the evaluation on the literature which was being used. The literature review will show how the each variable affect the women labor force participation rate. The theoretical review was used to give a basic knowledge in pursuing the empirical review. Review of empirical study allows us to understand more about the effect of education, total population, GDP, foreign workers, fertility rate and unemployment rate in women participation in Malaysian labor market. Section 2.2 is about theoretical review while Section 2.3 about empirical review. Then Section 2.4 is the conclusion.

## **2.2 Theoretical Review**

The definition of labor market is an informal market where workers find paying works, employers find willing workers, and where wage rate are determined. Labor markets may be local or national in their scope and are made up of smaller, interacting labor markets for different qualification, skills and geographical locations. They depend on exchange of information between employers and job seekers about wage rates, conditions of employment, level of competition and job location.

According to the theory of allocation of time exposed by Becker (1965), labor force participation decision of women is the result of a joint decision making process of her household. The household maximizes a combined utility function subject to constrains they face to determine the times allocated to home work, market work and leisure for the individuals. Thus, the time allocated to market work will depend on a number of personal and household characteristics as well as on the labor market characteristics. The labor market conditions determine the costs of a job search and the remunerations of the market work.

Meanwhile according to the theory of cyclic change in participation rates exposed by Mincer (1966), procyclic change in the labor force size also have been explained in terms of the timing of labor force participation by some individuals. For example, many married women are marginally attached to the labor force in that they plan to engage in labor market work for, say, only half of their adult years. The other half of their time will be spent in household production. Given this planned overall division of time, it is only rational for such women to participate in the labor force in prosperous times when jobs are readily available and real wages are relatively high and, conversely, to be nonparticipants when unemployment is high and available wage rates are low.

Female labor force participation rate is defined as the ratio of the female labor force to the female population. This rate refers to the probability that a female works. In addition, the numbers of female employed includes those who are in paid employment and those who are unpaid family labors. Women working on the family farm or business are considered economically active and thus counted in the labor force. In their study, discusses the conceptual ambiguity in the measures of labor force activity of women particularly those that occur within the family (Beneria,1981).

The World Bank (1995), writing on demographics and labor supply, notes that although no direct link exists between economic development and women's labor force participation, rapid development is often accompanied by higher female participation, higher levels of schooling for girls and lower fertility rates. In this context labor market conditions are also relevant. For example, migration reduces the domestic supply of male labor, inducing the entry of women into the labor force. Also, the economic downturn of the 1980s had an impact on women participation which tends to rise with recessions in low-income countries.

While based on study from Lim (1990), in the developed industrialized countries, increasing female labor force participation has been linked to the completion of the fertility transition. Furthermore, in many developing countries, however, fertility decline has been slow or stalled. One of the most striking phenomena of recent times has been the extent to which women have increased their share of the labor force. The increasing participation of women in paid work has been driving employment trends and the gender gaps in labor force participation rates have been shrinking. Especially in the 1980s and early 1990s, labor force growth was substantially higher for women than for men for every region of the world except Africa.

In other study, Rahamah (2012) discuss how management of working women in the workplace and household management. In this research, she has been using in-depth interview method with the respondents. Then, the results showed that working women face problems in doing the work at home and workplace. The woman said that they are not have enough time to manage the household and with work in the same time period. While at work as well as women will be faced with many problems such as promotion procedures unfair and colleagues who have different modes.

The proportion of women in employment is low in Pakistan because of factor like a religion, tradition, culture, and evolution in the institution. This item has prevented women from entering the labor market (Mahpara & Qurratulain,2011). In this study they found that there is discrimination in the market. This is because women are more likely to pay wages and low job status. In Malaysia, most women working in the unorganized sector. In addition, women are more focused on sectors with low productivity levels, lack of income stability and low job security as the two roles are held by women, namely in the home and workplace. Furthermore, in the government sector, the employment opportunities available to this group are very small and limited.

In Malaysia, the rapid expansion in manufacturing increased employment in the sector sharply during the Sixth Malaysia Plan period, and dramatically altered the employment structure. The attainment of virtual full employment in 1995 marked a new milestone in the country's socioeconomic progress. The unemployment rate decreased from 2.8 percent in 1995 to 2.6 percent in 1996. Women's participation in the labor force has increased very much since 1970, and even though Malaysia is a newly industrializing country, its female labor force participation rate compares favourably with those of the industrialized countries of the Asia and the Pacific region. Women constitute 43.4 percent of the workforce in the manufacturing sector. However, the majority of women remain in low-skilled, labor-intensive jobs in agriculture, and in semi-skilled assembly work in the industry sector (Aminah,1995).

### **2.3 Empirical Review**

Study by Zaimah et al. ( 2013 ), one of the most important factors that contributed to the increase in employment rates for females is the expansion of educational facilities across the country coupled with the increased of value attached to education. The opportunities and accessibility in education among women in Malaysia are driving the increase of their participation in the labor force (Sabitha, 2005; Jamilah, 2001; Aminah, 1998). Hence, this situation has led to the creation of dual-income families and dual-

career in Malaysia. The achievement of women in formal education has been remarkable since independence as seen by the steady increase in participation rate at the primary, secondary and tertiary levels.

Women have benefited to a large extent from the expansions of education facilities and the provision of increased educational opportunities. In Sixth Plan period (1991-1995), the improved educational status of women was reflected in higher educational attainment of the female labor force. For instance, the proportion of the female labor force with secondary and tertiary education was about 50 percent and 11 percent, respectively, in 1993 compared with 45.1 percent and 9.9 percent, respectively, in 1990. In contrast, the proportion of the female labor force with no formal education or primary education dropped from 15.7 percent and 29.3 percent, respectively, in 1990 to 12.6 percent and 26.4 percent respectively in 1993.

Pempelani (2013) examines the factors that influence the labor force participation of women in Namibia. One of the objective in the study is gain insights into factors (marital status, age, residence, education) that promote or hinder women from work. The rationale is that identifying factors affecting women's participation in Namibia's workforce may provide insight for practitioners and policy makers on how best to support women to either continue in employment or get engaged with work, thereby achieving Namibia's goal of gender equality. This study utilizes data from the Namibia

Households Incomes and Expenditure Survey of 2009/2010. The results indicate Namibian women are increasingly entering the labor force as a result of post-independence policies that emphasize greater gender equality. Age, education level, and place of residence (urban residence) are predictors of labor force participation rates of women. Marital status seems to be more a predictor of men's than of women's paid employment. The study concludes that increases in women's education in particular may prove useful in increasing women's employment in Namibia.

Study from Che Hashim (2009), where is the arrival of foreign labor in Malaysia is to help meet the shortage of labor of the various economic sectors of the country. If the influx of foreign worker not controlled, it will decrease the local population's employment opportunities. However, the arrival of foreign labor was able to increase the country's output and reduce the rate of wages in the local labor market. Despite the benefits received by both the sending and receiving countries, many problems arise in the receiving country, Malaysia. This paper will analyze the budget allocated for foreign labor, the trend of the foreign labor's arrival, the effects of their arrival on employment opportunities of the local people, the benefits received by both sending and the receiving countries. It also discusses effects of wages, and yields some recommendations to maximize the benefits of the entry of foreign labor in Malaysia and steps to be taken to minimize the problems faced by the local people and government of Malaysia.

In the others countries, the impression of foreign workers being a job robbers is the popular issues. This thing especially occurs to those countries accommodating a significant number of immigrants. Hence, there are a lot of researchers investigating the effect of immigration on native workers such as studies from Unites States, Canada and also America. Most of the studies shows that the immigration is not cause of unemployment, or even that is reduces the rate of unemployment ; Tian & Shan (1999), Friedberg & Hunt (1995), Borjas (1994), Withers & Pope (1993). However, the study from Lee (1992) found the evidence of immigration contributing to the high unemployment rate in Canada. All of the existing research in this area is based on the empirical studies where is the studies conducted by using the time series data or cross sectional.

Taylor (2006), there is two scopes to determined the effect of foreign labor on economic growth. The first is on their economy level and the second is on the economy level on the migrated country. The international migration of labor is an important component of globalization and economic development in many less developed countries (LDCs). The number of international migrants or people residing in a country other than their country of birth has increased more or less linearly over the past 40 years, from an estimated 76 million in 1965 to 188 million in 2005.

Tsani et al. (2012), investigates the relationship between female labor force participation rates and economic growth in southern Mediterranean countries. A two-step methodology involving econometric estimations and the use of a general equilibrium model was used for this purpose. The econometric estimations suggest that there is a U-shaped relationship between economic growth and female labor force participation rates and they indicate the presence of region-specific barriers impeding women's entry into the labor force in southern Mediterranean countries. The econometric results were fed into a general equilibrium model, which was used to simulate two alternative assumptions on developments in female labor participation rates in the region up to 2030. The first of these simulated changes in female labor force participation rates arising from income level trends projected for the period 2015–2030 in southern Mediterranean countries. The second assumed the lowering of region-specific barriers which deter female labor force participation. The results of these simulations suggest that lower female labor force participation rates may lead to marginally lower economic growth in the region, while the removal of region-specific barriers to female labor force participation may encourage economic growth. This has important policy implications, suggesting that policies intended to remove such barriers could help to promote the growth of the region's economies.

Based on study from McNown (2001), women's labor force participation rates have risen on 3.9 percent in the past 20 years, from 35.5 to 39.5 percent. Almost 80 percent of all employed women work was include librarian's health technicians, secretaries, typists, teachers, and child care worker in labor market. Model of linear regression analyses suggests that the percentage of women in the labor force is directly related to total fertility rate, whereas the average number of years of education for women is indirectly related to total fertility rate. The participation of females in the labor force is negatively related to fertility rate for many reasons. Female employment outside the home is related to forming small families, working women tend to have fewer children than those who do not work because employment entails alternative satisfaction to children.

While according to Norehan and Nor Aznin (1990), the purpose of their study is to find the relationship between total fertility, women's labor force participation and education in Malaysia using time series data for the years 1980-2000. The method they use is couple of econometric model where is Stationary tests and also Johansen Cointegration. To examine the relationship between fertility, female labor force participation and education, conventional regression analysis was used. The study shows that the function of fertility, education significant negatively related to fertility. While the female labor participation variable is positive but not significant affect fertility. Instead the function of the labor participation of women, fertility is

negatively related significant with the participation of women workers, but education is not significant positively related to female labor participation.

Study by Engelhardt et al. (2001) examines causality and parameter instability in the long run relation between fertility and female employment. This is done by cross national comparison of macro-level time series data. By applying error correction model, they find causality in both directions. This finding is consistent with simultaneous movements of both variables brought about by common exogenous factors such as social norms, social institutions and financial incentives. They also find a significant negative correlation until 1970s, respectively 1980s and insignificant or weaker correlation afterwards. This results is consistent with a recent hypothesis in the demographic literatures according to which changes in the institutional context like childcare availability and attitudes toward working mothers might have reduced the incompatibility between childbearing and female employment.

Cheng (1996) using the method-related reasons for the U.S. data for the year 1948-93 has been found that there is no one-way relationship because of the fertility of female labor force participation. Once again he emphasized that the work does not prevent or reduce the probability of having more children, but have small children at home did not encourage them to work. Using time series data in Japan, Cheng have found that working in the labor market does not prevent women from having more children, but have small children at home did not encourage women to go out to work.

Mourik and Siegers (1991) was to analyse the effect of unemployment on the labor force participation of men and women in the Netherlands. The study found that in the case of men, labor force participation is significantly and negatively influenced by the magnitude of temporary unemployment, and that the permanent rate of unemployment does not seem to be a significant explanatory variable of male labor force participation. While, in the case of women, participation is not influenced by the magnitude of transitory unemployment, whereas the permanent rate of unemployment does not seem to exert a significant negative influence. The model estimated contains several unemployment indicators as explanatory variables and uses the own wage rate, other family income (defined as total family income minus own labor income), own wage and the presence of children as control variables. This study used the data from an inquiry held by the Social and Cultural Planning Bureau of the Netherlands.

## **2.4 Conclusion**

For the conclusion, the factors that were discussed in this chapter are influenced the women participation in labor market. These factors were identified in several studies that done by other researcher. Therefore, these factors will be used as the information for this research. In the next chapter we will looked at the methodology of this paper.

## **CHAPTER 3**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter will focus on the data and methodology based on the theoretical and empirical arguments in the literature. Section 3.2 is about the data collection method. This study utilize data from Department Of Statistic, Department Of Economic Planning Unit, World Bank Data, Ministry of Higher Education. All of the data from year 1982 until year 2011 will be employed. Section 3.3 presents the research framework where is the Dependent Variable (DV) is WLFPR and the Independent Variables (IV) is consists of six variables where is education, TFR, GDP, population of female, unemployment rate and the rate of foreign worker. Section 3.4 discusses the model specification while the empirical model be discussed in Section 3.5. Section 3.6 discusses the description of each variables followed by the estimation procedure in Section 3.7. The last section is Section 3.8 concludes this chapter.

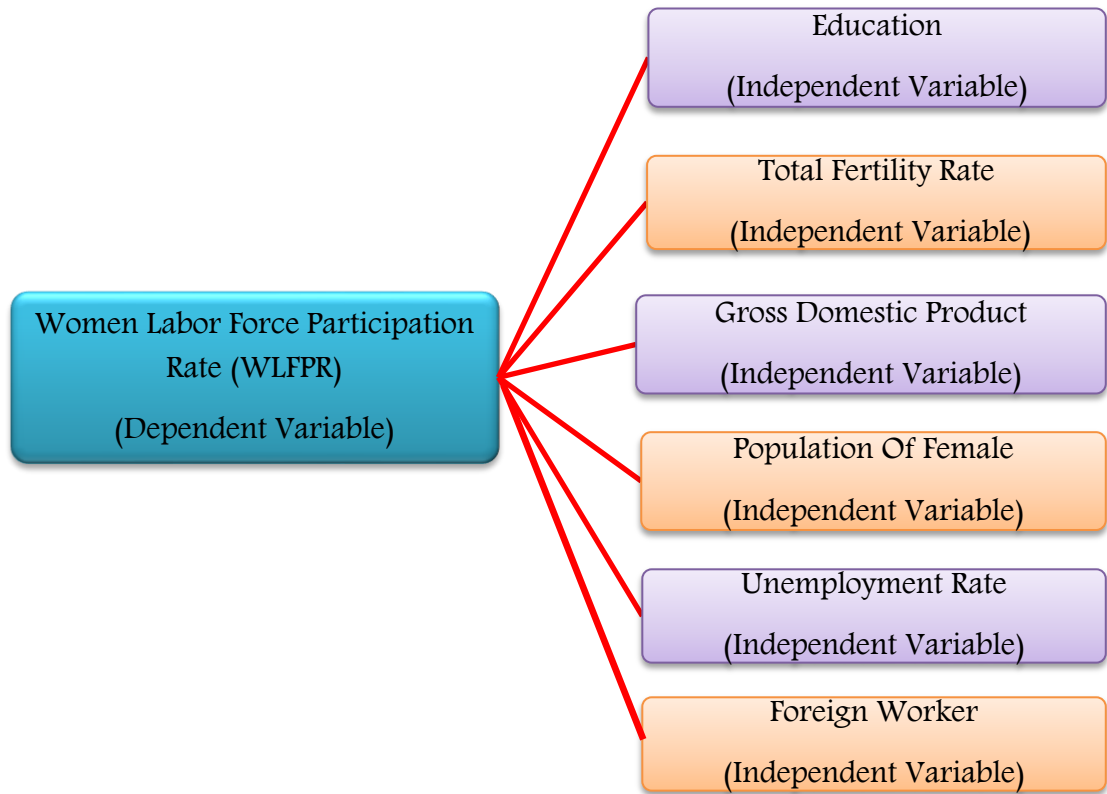
### **3.2 Data Collection Method**

The data collection method used is through literature review (desk-research). A variety of accurate information is obtained and can be used as a reference for more detailed study. Among the materials involved are books, magazines, journals and the internet. The source of data called secondary data because all the used is published and come from the organization such as Department of Statistic, Department of Higher Education, Department of Human Resource and World Bank Data , and it also from the other surveys.

In this study, the data used is time series data which is collected over discrete interval of time. The key feature of time series data is that the same economic quantity is recorded at a regular time interval. This study on women labor force participation rate in Malaysia uses data from 1982 until 2011 (30 years). This study employs the Multiple Linear Regression Model (MLRM) because there are more than two independent variable which is education, GDP, TFR, population, unemployment rate and also foreign worker.

Besides that, this study use multiple regression analysis because it's more amendable to ceteris paribus analysis because it allows us to explicitly control for many other factors that simultaneously affect the dependent variables (Wooldridge,2013).

### 3.3 Research Framework



### 3.4 Model Specifications

The model specification on WLFPR is given as below:

$$Y = f ( Ed, TFR, Gdp, Pop, Uem, FW ) \dots\dots\dots (3.1)$$

Where is:

**Y** denotes the women labor force participation rate (WLFPR) ; **Edu** is the tertiary education of women ; **TFR** is total fertility rate ; **GDP** is the real GDP; **pop** is for percentage population of women ; **Uem** is unemployem rate of female and **FW** is the percentage of foreign worker. At this above equation showing that at any moment the WLFPR (Y) has a relationship with the education, fertility rate, Gdp, population, unemployment rate and foreign worker.

### 3.5 Empirical Model

In this section, the discussion is focused on the expansion explanatory variable in the equation (3.1). The proposed empirical model by equation (3.2) is as follow for the effect of components of selected variables on WLFPR.

The empirical model is written as following :

$$Y_{it} = \beta_0 + \beta_1 Ed_{it} + \beta_2 TFR_{it} + \beta_3 Gdp_{it} + \beta_4 Pop_{it} + \beta_5 Uem_{it} + \beta_6 FW_{it} + \varepsilon_{it} \dots (3.2)$$

Equation (3.2) describe the equation of WLFPR where  $Y_{it}$  is women labor force participation rate.  $Ed_{it}$  is education,  $TFR_{it}$  is total fertility rate,  $Gdp_{it}$  is Gross Domestic Product,  $Pop_{it}$  is population rate of female,  $Uem_{it}$  is unemployment rate of female and  $FW_{it}$  is foreign worker. The constant is denoting for  $\beta_0$  while  $\beta_1-\beta_6$  are the coefficient show how much a unit of increase in each variable will affect the WLFPR.

### 3.6 Description of Variables

In this part, the discussion will be detail justification of each variable in the econometric model at (3.2).

#### i) Education

Education is an important element in the realization of sustainable economic growth. Neoclassical economists had shown that investment in human capital through education is one of the main factors that determine an individual decision to join the labor market.

Individuals with tertiary education attainment are more likely to join the labor market. In Malaysia, even more the number of women in higher education, but their participation in the labor force is much lower than men. This shows that many women with tertiary education in Malaysia is expected to choose to be outside the labor force from the labor market. This is one of the major issues facing human resource development planning at the macro level at the moment. Therefore, research should be conducted to identify the truth of the issue so that appropriate strategies can be developed to increase the participation of women in the labor force with tertiary education.

ii) Fertility rate

Over the last several decades the labor market participation rates of married women have increased and fertility rates have declined in most developed countries. The growth of women's participation in the labor market carries with it some positive and negative implications for the ability of countries. Theory says that the lower fertility rate of women, they more like to enter the labor market. In addition, if the fertility rate factor has a significant and negative relationship to female labor force participation, the policy makers need to devise strategies to create an efficient mechanism that can support re-entry of women into the labor market. This is because to avoid an increasing in the unemployment rate among women.

### iii) Gross domestic product (GDP)

Economic growth is spurred by accumulation of physical and human capital and through advances in technology. Many factors can promote or hinder these processes. Experience shows that countries that have grown rapidly have been successful in creating conditions that are conducive to long-run per capita income growth. Some interesting and positive impacts of human capital on economic development are analyzed in Guisan (2001).

In the Eighth Malaysia Plan, women have provided a significant contribution to social and economic development country. So, active participation of women in employment in turn can help propel the growth momentum of the economy sectors. Besides that, growth in the labor force is one of two key determinants of the nation's maximum sustainable, or potential rate of economic expansion. For example, for more than five decades, a growing labor force provided a sizeable boost to the potential rate of expansion in the U.S. economy. Driven by the emergence of the baby boom generation and the entry of women, growth in the labor force added about 1.7 percentage points per year to the average annual growth in potential real GDP from 1948 to 2001 (CBO,2007).

#### iv) Population rate

Based on the Census of Population in 2009, about 49.25 percent of the population is the women and 49.1 percent of women were in the group of working age in the age range 15-64 years. However, the labor force participation rate women amounted to only 46.8 percent compared to the participation of 78.9 percent of men (Report Investigation of Labor,2010). Clearly the contribution Malaysian women workforce is still low compared men. Due to the important role of women in developing the national economy, the study of the population is important to encourage the participation of women in employment.

#### v) Unemployment rate

Unemployment, as defined by the ILO occurs when people without jobs and they have actively looked for work within the past four weeks. The unemployment rate is a measure of the prevalence of unemployment and it is calculated as a percentage by dividing the number of unemployed individuals by all individuals currently in the labor force. An important feature is that women's jobs and income earning capacity tend to be increasingly insecure.

Women generally have higher rates of unemployment and especially of under-employment and disguised unemployment than men and find it harder to re-enter employment once they lose their jobs. With changing skill requirements in many of the zones, men rather than women are being hired and the proportion of female employees tends to drop.

#### vi) Foreign Worker

Do Malaysia need foreign workers to support the growth of economy? By the end of 80's, the booming of industrial revolution in Malaysia started. The country's population could not catch up the surge forward by eager entrepreneurs. Sectors such as construction, services, plantation and manufacturing industries actually drained off all the local manpower resources. As a result, the country needed to import workforce due to several reason. Local people who were being trained were promoted to supervisor level or higher management level, thus more vacancies are available. Malaysia's entrepreneurs overcome the manpower shortage problem by import workforce from other countries which had excess manpower at a reasonable cost. The foreign workers who being employed not only obtain the job opportunity where their own country shortage of, but also earn an income to improve their lives of his family.

However, the issue of total foreign workers is increasing day by day and becoming a problem for our country. This is because, foreign workers may cause the declining of women participation rate in Malaysian labor market. When the companies hire the foreign workers, jobs opening for the locals are diminishing as they have to compete with the foreigners. In fact, some companies prefer to hire foreign workers as they are willing to accept lower pay from the locals especially in the lower skilled jobs. Consequently, more locals will be jobless and unable to contribute economically to the country. Furthermore, the burden will be put on the government as social welfare expenses will be higher. The foreign workers come mainly from countries that have internal problems such as Indonesia, Philippines, Vietnam, India, Myanmar, Bangladesh, Nepal and the latest is from China.

### **3.7 Estimation Procedure**

#### **3.7.1 Multiple Linear Regressions**

This section discusses about econometric procedure in order to examine the influence of education, GDP, TFR, unemployment rate, population and foreign worker towards WLFPR.

The Ordinary Least Squares (OLS) approach to multiple linear regression was introduced by Gauss in 1794. The OLS procedure is the simplest type of estimation procedure used in statistical analyses. However, in order to benefit from the well-behaved properties of an OLS estimate, a number of assumptions must be satisfied. There are five assumptions necessary to produce unbiased estimators using OLS. Additional assumptions must be satisfied in order for the estimate to have other favorable qualities.

### **3.7.2 Unit Root Test, Johansen Cointegration Test and Granger Causality**

This section discusses about econometric procedure in order to examine the relationship between total fertility rate and women labor force participation rate. First is regarding the unit root test before proceeding to the further test in econometric. Next is the Vector Autoregressive Models (VAR) approach and test for cointegration using Johansen cointegration to see if a long relationship between the variable exists. And last is the Granger Causality test.

### 3.7.2.1 Unit Root Test

This study uses time series data. Most of the study that using a time series data, have to test if the data exist characteristic of stationary or not in order to accept the  $H_0$ . However, almost all the time series data is non-stationary. This study uses Augmented Dickey Fuller (ADF) to check the stationary of the variable in the model. This ADF test is enables the presence of unit root in the data collected. The decision to know whether there is a unit root or not depends on this regression form:

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \alpha_i \sum \Delta Y_{t-1} + \varepsilon_t \dots \dots \dots (4)$$

Where  $\Delta Y_t = Y_t - Y_{t-1}$ ,  $\varepsilon_t$  an error term. While  $\beta_1$ ,  $\beta_2$ , and  $\alpha_i$  the set of parameters to be estimated. In the both test, which is null and alternative hypothesis in unit roots test are:

$$H_0 : \delta = 0 \text{ which mean } y_t \text{ is non stationary}$$

$$H_1 : \delta \neq 0 \text{ Which mean } y_t \text{ is stationary}$$

According to the test, we can rejected  $H_0$  hypothesis if the t-test statistics less than the critical value, which means that, a unit root exists when if the null hypothesis of  $\delta$  equals to zero that is not rejected (Gujarati ,2003).

### 3.7.2.2 Johansen test for cointegration

Cointegration test is important in order to examine the time series variables long-run relationships. Cointegration can be defined as an econometric property of time series variables. The time series variables are called cointegrated even if two or more series are themselves non-stationary as long as a linear combination of them is stationary. Cointegration also can be used to correct the testing hypotheses concerning the relationship between two variables having unit roots. Testing for cointegration can be done by using the approach that was proposed by Johansen (1988) and procedure for cointegration test of several time series can be called Johansen Test. Johansen developed a maximum likelihood estimation procedure that also allows one to test for the number cointegrating relations. Although there're exists a number of cointegration tests, Johansen's test has a number of desirable properties, including the fact that all test variables are treated as endogenous variables. By using Johansen approach, it will involve the test of cointegrating vectors.

$$Y_t = \Pi_1 Y_{t-1} + \Pi_2 Y_{t-2} + \dots + \Pi_k Y_{t-k} + \varepsilon_t \quad \dots\dots\dots (1)$$

$$t = 1, 2, \dots, n$$

where  $Y_t$  is  $N \times 1$  vector of stochastic variable,  $\Pi_1, \Pi_2, \dots, \Pi_k$  is the  $n \times n$  parameter and  $\varepsilon_t$  is the random error. When  $Y_t$  is non-stationary, the above equation can be written as below:

$$\Delta Y_t = \Gamma_1 \Delta Y_{t-1} + \Gamma_2 \Delta Y_{t-2} + \dots + \Gamma_{k-1} \Delta Y_{t-k+1} + \Pi Y_{t-k} + e_t \dots \dots \dots (2)$$

$$\text{Where } \Gamma_i = - [I - \Pi_1 - \Pi_2 - \dots - \Pi_i] \dots \dots \dots (3)$$

$$i = 1, 2 \dots k-1$$

$$\Pi = -[I - \Pi_1 - \Pi_2 - \dots - \Pi_k] \dots \dots \dots (4)$$

The matrix  $\Pi$  captures the long run relationship between  $p$  variables, and this can be decomposed into two matrices, A and B, such that  $\pi = AB'$ . A is interpreted as the vector error correction parameter and B as cointegrating vector. This procedure is used to test the existence of a long run relationship among the variable and in this study, the variable is WLFPR and TFR. The cointegration test specified above can only show the long run relationship between the variables of interest and not the direction.

### 3.7.2.3 Granger Causality Test

The relationship between TFR and WLFPR has received much attention in past literature. However, the direction of causality is still unclear. Therefore, we would like to adapt this analysis in our study so that we can identify the causality experienced by this country. Granger Causality Test is a test that help us to know the two variables are related but we don't know which one cause the another variable. Granger causality is a circumstance in which one time series variables

consistently and predictably changes before another variable does. If one variable precedes another, we still cannot be sure that the opposite is not the case (Studenmund,2001).

Granger causality test is a technique for determining whether one time series is useful in forecasting another. Granger causality occurs when  $X$  changes and changes in  $Y$  follow thereafter. Then, we said that  $X$  “Granger causes”  $Y$ . According to Granger (1969), if the information in the past and present values of  $X_t$  helps to improve the forecasts of the  $Y_t$  variable, an economic time series  $Y_t$  is said to be “Granger cause” by another series  $X_t$ . The most popular version of the Granger test for causality involves an F-test. In other word, we can say that this cause usually can be seen through a series of F-tests on lagged values of  $X$  and with lagged values of  $Y$  also known, a time series  $X$  is said to Granger-cause if it can shown that those  $X$  values provide statistically significant information about future values of  $Y$ . The hypothesis for testing is as follows:

$H_0$ : All slope coefficients for the lagged  $X$  variables are zero

$H_1$ : At least one slope coefficient for the lagged  $X$  variables not zero.

The test by first doing a regression of  $\Delta Y$  on lagged of  $\Delta Y$ . Once the appropriate lag interval for Y is proved significant (t-stat or p-value), subsequent regression for lagged levels of  $\Delta X$  are performed and added to the regression provided that they, (1) are significant in and of themselves and (2) add explanatory power to the model. It is always a better idea to run the test other way in order to get more confirmation. More than one lag level of variable can be included in the final regression model, provided it is statically significant and provides explanatory power.

### **3.8 Conclusion**

This chapter explained the source of all the data and the method that was used in this study. Besides that, there is the discussion about the description of each variable used. In the next chapter will discuss about the analysis of the data.

## **CHAPTER 4**

### **TREND OF WOMEN LABOR FORCE PARTICIPATION RATE (WLFPR) WITH SELECTED VARIABLES**

#### **4.1 Introduction**

This chapter discusses about the trend of WLFPR with each selected variables. Section 4.2 show the trends of WLFPR separately while Section 4.3 to Section 4.8 show the trends of WLFPR with all the variable. There is a certain pattern of connection among the variables and WLFPR within 1982 to 2011.

#### **4.2 Women Labor Force Participation Rate**

Based on the figure 4.1, it refers to the percentage of women participation in Malaysian's labor market. According to this figure, it shows the trends of women labor force participation rate in labor market is below 50% for each year starting from 1982 until year 2011. Begin from year 1982, the rate shows only 44.5% women participate in labor market.

After two years, the rate is slightly increased where is the rate only 45.2% in year 1984. That means only 0.7% increases in two years. Unfortunately, after year 1984, the women participation rate is decrease from 45.2% to 44.2% in year 1986. This is because since 1982 and with the exception of 1984, economic growth was adversely affected by a significant drop in the ratio of export-import prices and export demand slowed as protracted global recession (Fifth Malaysia Plan,1986-1990).

In 1986, the rate of female participation in labor market is 44.2% and increase to 46.5% in 1988. WLFPR also increases from 1988 to 1990 where is the rate from 46.5% to 47.3%. From 1990 until 1992, the rate is slightly increase where only 0.3%. So, the rate of women labor force participation in labor market is only 47.8% for 1992. The increasing of WLFPR occurs over the years because the government has been encouraging the participation of women in national development by opening up opportunities to venture into the wider social, economic and political. Formulation of National Policy on Women (NPW) reflects the determination of the government to optimize the potential of women in social and economic development of the country. Recognizing the diverse roles of women in family, society and the economy, the government also recognizes that specific strategies should be developed to effectively involve women in the development process.

Towards this end, considerable effort will be made to minimize the limitations of existing stages and help women to participate in social activities and the economy. These measures are in line with the objectives of NPW to integrate the contributions of women in national development efforts.

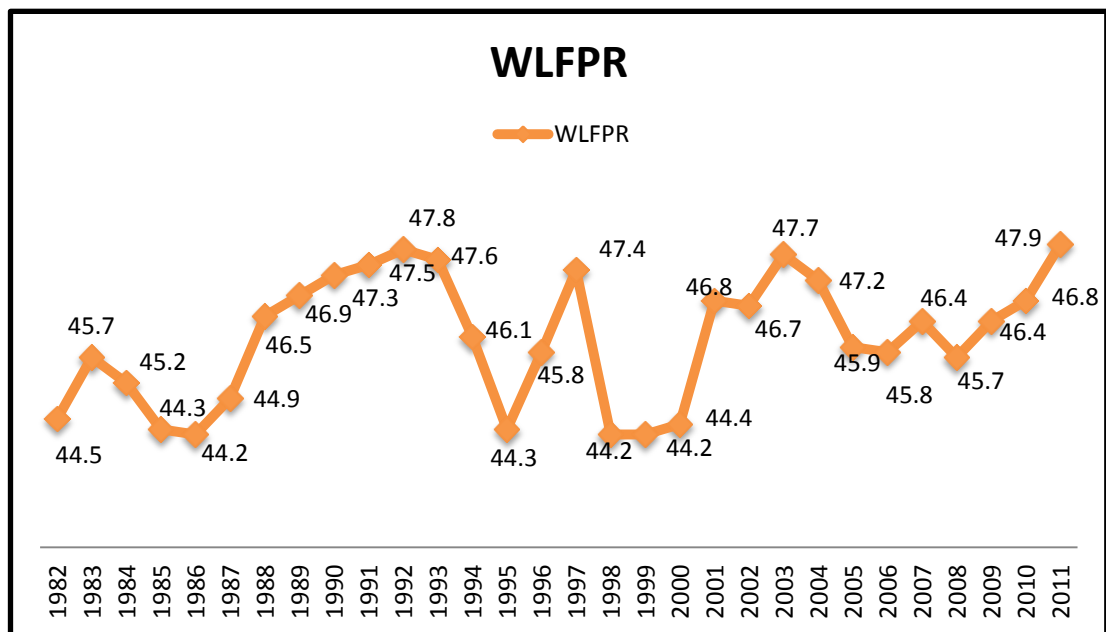
Furthermore, WLFPR in labor market decrease from 1992 to 1994, 1994 to 1996 and also from 1996 to 1998. In 1992 the rate is 47.8% and decrease to 46.1% in 1994. The amount of reduction is 1.7%. While for year 1994 to 1996 decreased as much as 0.3% where is 46.1% to 45.8% for year 1996. Then this rate also decreased from 1996 to 1998 where is from 45.8% to 44.2%. That means the amount of reduction rate as much as 1.6%. The reduction of WLFPR in Malaysian labor market probably due to increase in rates of foreign workers in an employment sector which is the influx rate of foreign workers was 4.9% in 1992 and increased to 11.4% in 1998.

In addition, based on the trend of women participation rate in labor market, there are slightly increased where is 44.2% in 1998 and increased to 44.4% for 2000. The rate is increased until year 2004. The rate of increasing as much as 2.7% and will lead the rate of participation to 47.2% for 2004. The increasing in WLFPR because of women continues to make significant contributions in various fields of national development through greater participation in economy. This increase has been achieved through the

continued implementation of policy Women (NPW) and the Plan of Action for the Advancement of Women which contains implementation of training programs to increase the sensitivity and awareness of the gender. In addition, the removal of legal and institutional constraints participation of women in the development process makes it easier involvement of women.

Furthermore, based on the trend of female participation in the labor market, the participation rate return declined from 2006 to 2008. This is because in 2004, the rate was 47.2% but fell to 45.7% in 2008. This means that the rate of decline was 1.5%. However, from 2009 until 2011 the women labor force participation rate in labor market is increase where is 46.4% for 2009, 46.8% for 2010 and 47.9% for 2011. During the Eighth Plan period, women continued to make tangible contributions towards the social and economic development of the nation. Women attained higher levels of education, increased their participation in the labor force and were involved in various business activities. And during the Ninth Plan period, government has provided an enabling environment to ensure more effective participation of women in national development. Women have been equipped with the necessary skills and knowledge to enable them to be more competitive and versatile to meet the challenges of a knowledge-based economy.

For overall the trends show the rate of women participation is fluctuates by year to year and slightly increase or decrease. The higher percentage of women participation is in year 2011 where is 47.9% and the second higher rate is in year 1992 where the rate is 47.8%. While the lowest rate in year 1986 and 1998 which is only 44.2% women enter the job market.

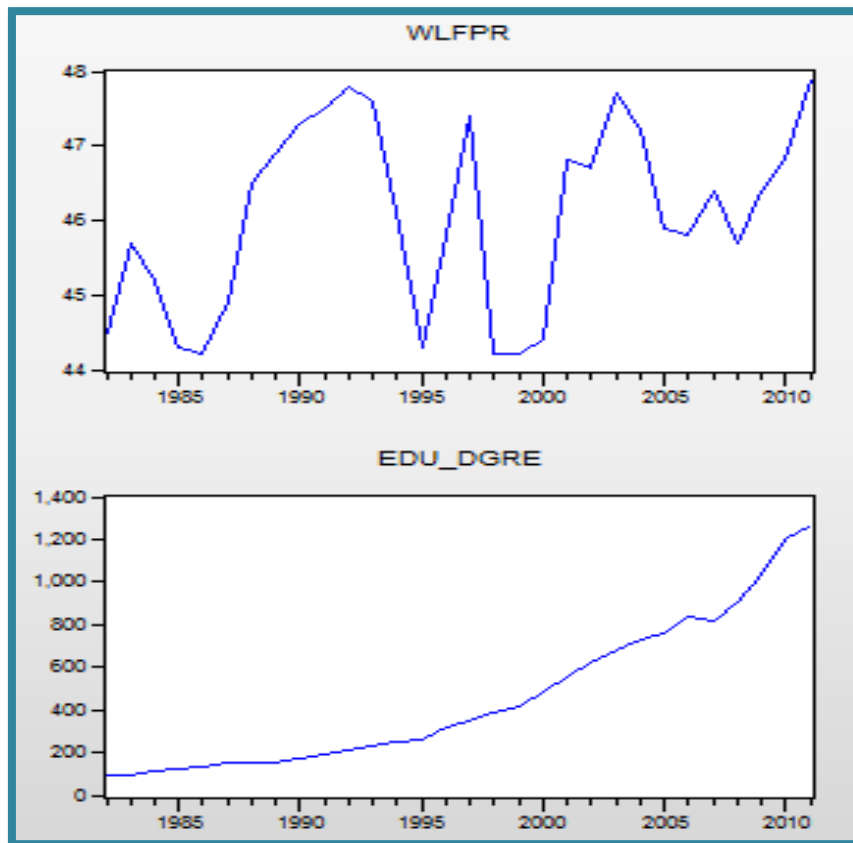


Source : Department of Statistic, Malaysia

Figure 4.1 : Women Labor Force Participation Rate, 1982-2011

### **4.3 WLFPR and Education**

Figure 4.2 illustrates the WLFPR and education where is women labor force by degree obtained from 1982 to 2011. Actually, according to statistics from the Department of Statistics Malaysia showed that more women pursue higher education namely Bachelor compared to men. For example, in 2004/2005 a total of women is 64.1% compared to only 35.9% of men. The figure shows the number of women labor force by the degree obtained was increased from 1982 to 2011. In addition, with the increasing level of education and employment opportunities and the implementation of more flexible working arrangements so more women are expected to participate actively in economic activities. WLFPR was increased from 45.7% in 2008 to 47.9% in 2011. As more and more women get higher education, their participation rate in professional and technical group is expected to increase. The increase in female labor force participation rate will increase the supply of local labor and this will reduce the need for foreign workers and professionals.



Source: Department of Statistic, Malaysia

Figure 4.2 : WLFPR And Education, 1982-2011

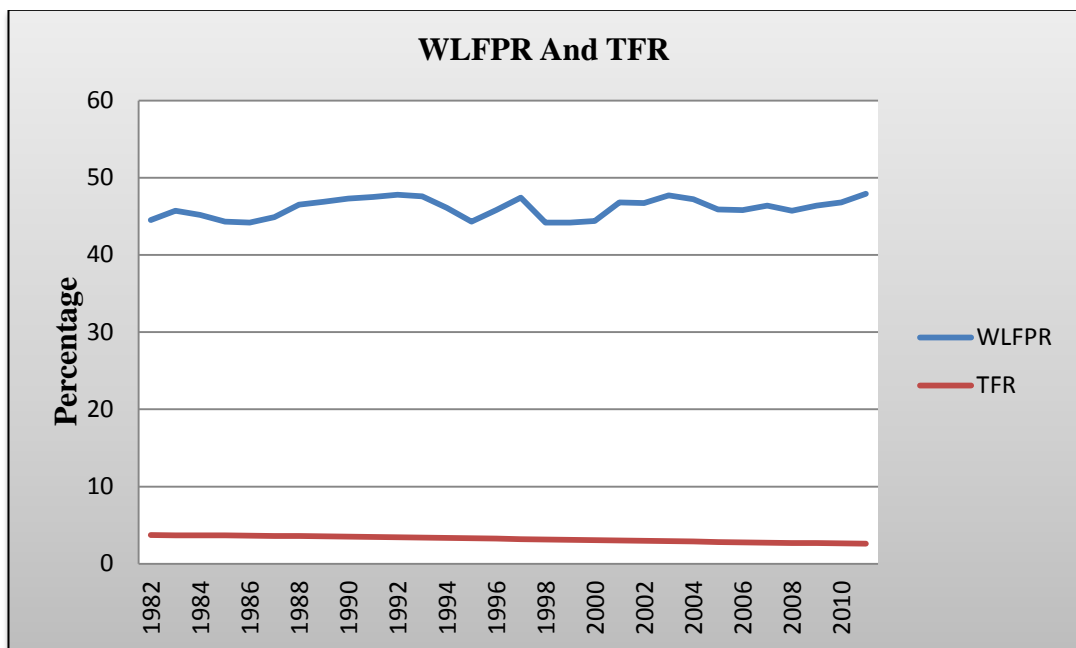
#### 4.4 WLFPR And TFR

Figure 4.3 illustrates the TFR and WLFPR for Malaysia for the period of 1982 to 2011. TFR in Malaysia is decreasing from 3.73% to 2.61% within 1982 to 2011, but WLFPR increasing with small ratio around 44.5% to 47.9% within that time. Even though WLFPR increases with a small ratio, but it is found that more women prefer to choose working than leisure.

Malaysia exhibits the role of government policy which influenced the course of fertility transition; however, the transition was not uniform across ethnic groups. In Malaysia, TFR dropped substantially from 5.4 in 1967 to 3.5 in 1987 and the decline slowed somewhat to 3.3 in 1997 (Peng,2002). The establishment of the national family planning programmed in the 1960 along with the impressive gains in socioeconomic indicators led to a sustained decline in fertility among Malays and an accelerated decline among people of Chinese and Indian ethnicity. However, the slow pace of the overall fertility decline in Malaysia during the period between 1987 and 1997 is the result of a differential response by ethnic groups to the inequalities in the level of socioeconomic development and government policy changes. In addition to changes in the institutions of family and fertility population attributed to the influence of education, increased participation of women in labor market also affect the role of the family and population fertility treatment.

Changes in rates of female participation in the labor market is once again showed inverse relationship with the trend of fertility decline in population in the country. According the fall in fertility developed countries are affected by the strong participation of women in the workforce, but fertility decline in developing countries is strongly influenced by factors such as the age of first marriage, level of education and social mobility among women. In this context, the country's efforts to open more opportunities jobs requiring the services of women workers also indirectly influence the behavior of these women in a family business and control their own fertility.

As more women continue their education or training at a higher level, the total fertility rate, the number of children may be born by women in the age of fertility, will continue to decline. In addition, at the age of late marriage, increased urbanization, cost of living and a higher standard of living is expected to be smaller family sizes. Decline in fertility rates would change the demographic structure of population within the next ten years.

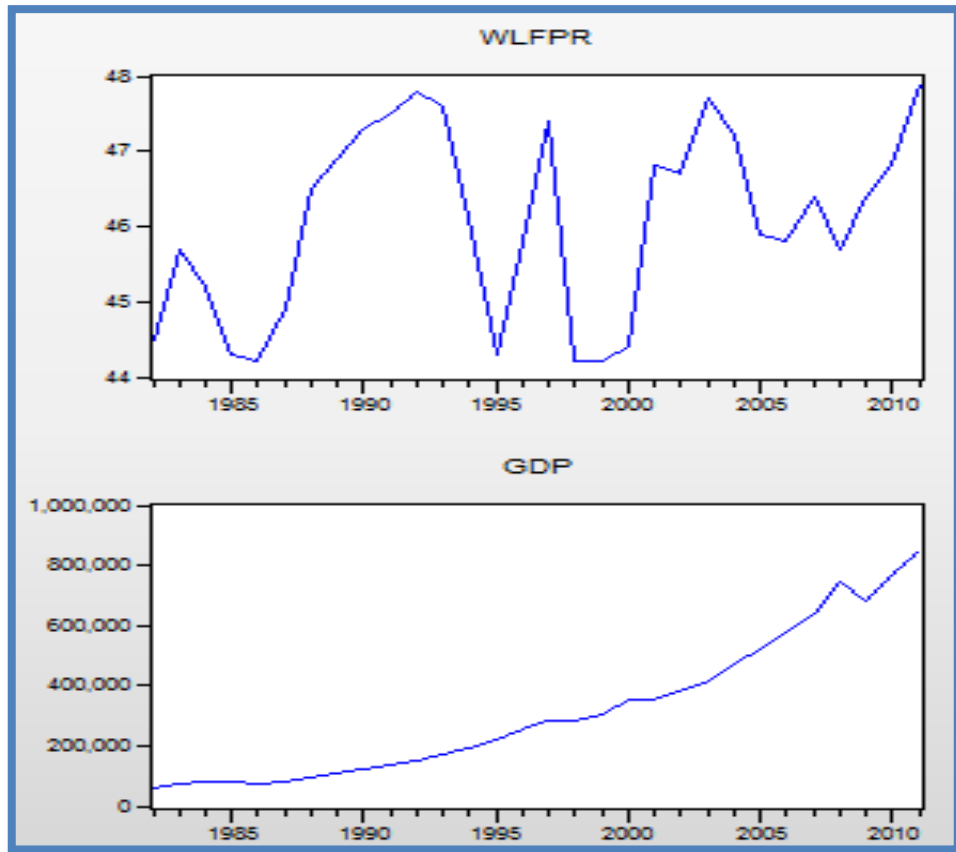


Source: World Bank Data

Figure 4.3 : WLFPR and TFR, 1982-2011

#### 4.5 WLFPR and GDP

Figure 4.4 shows the WLFPR and the GDP of Malaysia from 1982 to 2011. The GDP is increase over the year . In 2000 the GDP is highly increase because from 1999 the GDP only RM300764 million and increase to RM356401 million. This means the amount of the increase was RM55637million. This number increased to 2011 in which the amounts of RM852734million. However, a sharp increase in 2000 does not affect the substantial increase in the WLFPR because only increased by 0.2%. In addition, the continuous increase in GDP until 2011, also did not affect WLFPR to increase substantially even just having a bit rate fluctuations. Actually women have provided a significant contribution to economic and social development country. So, active participation of women in labor market can help propel the growth momentum of the economy sector.



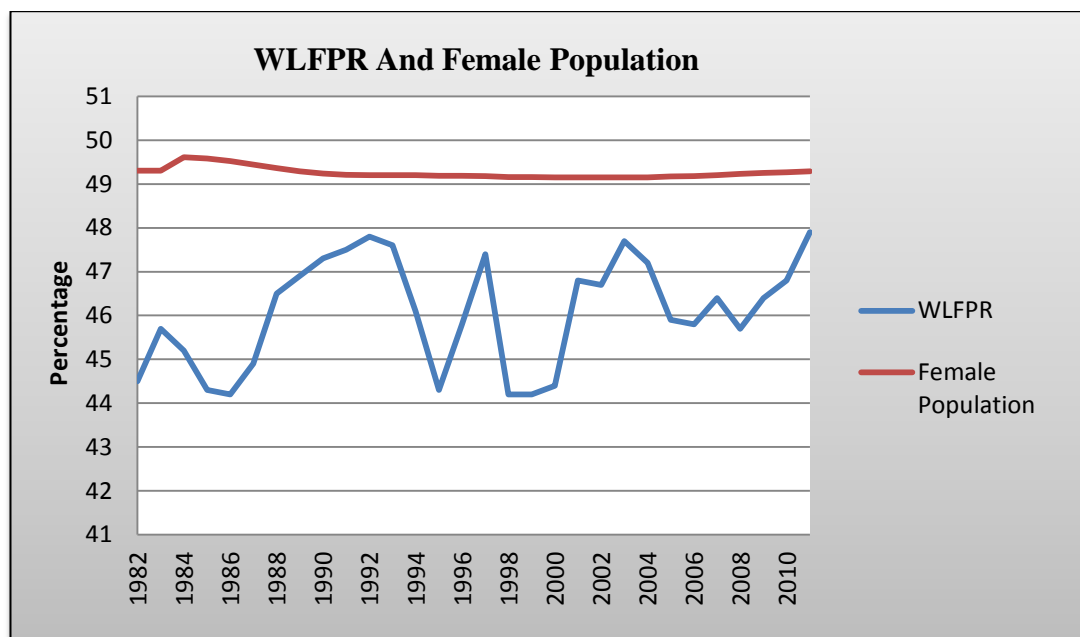
Source: World Bank Data

Figure 4.4 : WLFPR and GDP, 1982-2011

#### 4.6 WLFPR and Population, 1982-2011

Figure 4.5 illustrates the WLFPR and population rate of female starting from 1982 to 2011. The female population rate is more or less same as being at the same rate where is not less than 49% and not increase to 50%. However, WLFPR is fluctuates within that year and the rate is lower than rate of population. This is because the WLFPR not achieve rates of up to 48% but population is more than 49%. That means the population is higher rate than WLFPR. Decline in fertility rates would change the demographic structure of

population. Based on the Census of Population, in 2011, 88.2% or 9.57 million women were in the group of working age in the age range 15-64 years. However, the labor force participation rate of women amounted to only 47.9% or 4.58 million were in labor force. Clearly the contribution Malaysian women workforce is still low although the population is high.

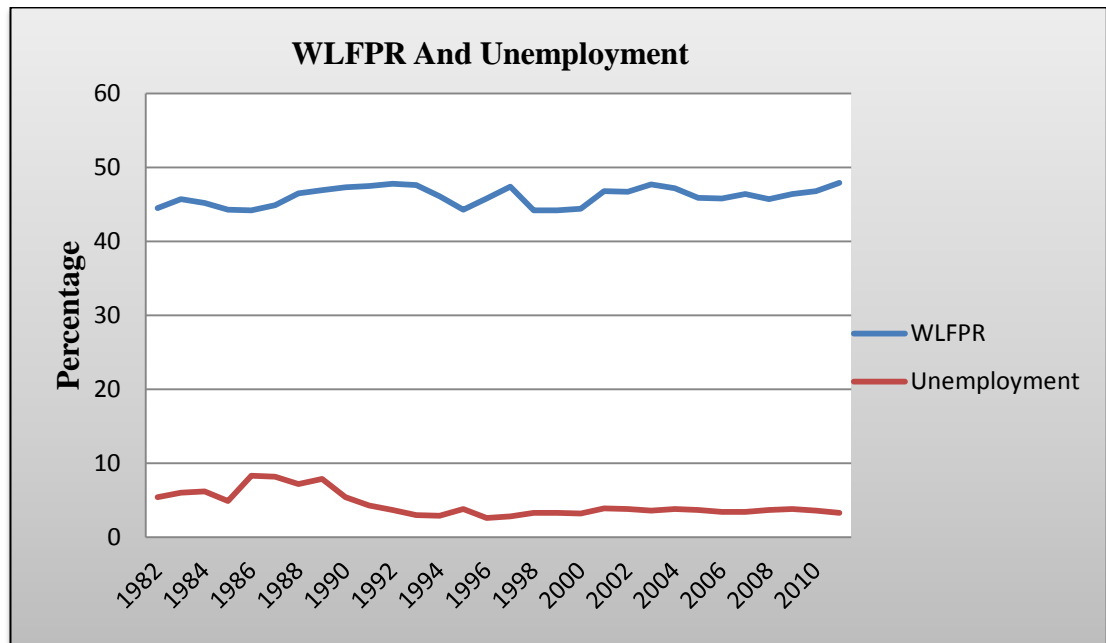


Source : Economic Planning Unit, Malaysia

Figure 4.5 : WLFPR and Female Population, 1982-2011

## 4.7 WLFPR and Unemployment

Figure 4.6 illustrates the WLFPR and unemployment rate of women for the period of 1982 to 2011. The unemployment rate is increase from 5.4% to 7.9% within 1982 to 1989. While for the WLFPR the rate also increase with the small ratio around 44.5% to 46.9% within that time. Then, the unemployment rate of female is decrease and WLFPR is increase. Starting from 1989, the rate of female unemployment rate is 7.9% and decrease to 2.8% in 1997. For WLFPR is slightly increased within that year. With the increasing level of education and employment opportunities and the implementation of more flexible working arrangements so more women are expected to participate actively in economic activities. After that year, the unemployment rate is slightly increase where is 2.8% for year 1997 to 3.3% in 1998. This rate continues to experience ups and downs until 2011 where the rate of less than 4%. That means the rate is stable. WLFPR suffer the same predicament that rate volatility is not fixed.



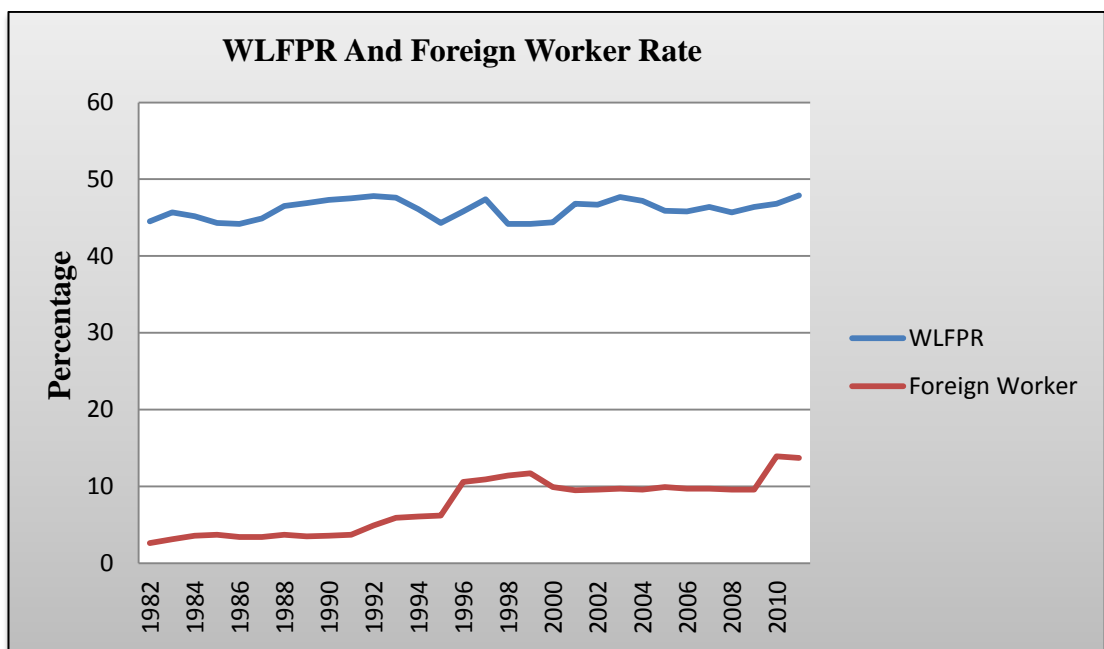
Source : Department Of Statistic, Malaysia

Figure 4.6 : WLFPR and Unemployment Rate, 1982-2011

#### 4.8 WLFPR and Foreign Worker

Figure 4.7 illustrates the WLFPR and foreign worker in Malaysia start from 1982 to 2011. The figure shows that the foreign worker rate in Malaysia is increase from 1982 to 2011. The highest rate of foreign worker in 2010 where the rate is 13.9% and the WLFPR is equal to 46.8%. Furthermore, in 1995 to 2000 an increase of foreign workers in the country is high and causes a reduction of WLFPR. The entry of unskilled foreign workers such as Bangladesh, Vietnam, Philippines and other causes WLFPR reduced.

This is due to the influx of foreign workers, especially women, causing employment to local women workers particularly limited in sectors such as services and manufacturing. The employer certainly would prefer foreign workers because of their lower wages compare to local workers.



Source : Department of Statistic, Malaysia

Figure 4.7: WLFPR and Foreign Worker, 1982-2011

## **4.9 Conclusion**

This chapter firstly discusses on trend of only WLFPR without any variable. Then, there are show the trend of WLFPR with each variable. There are several pattern of connection between WLFPR and each variable. So in further discussion, this study will find that which variable influence the WLFPR and find out the causal relationship between these two variables based on model specification and econometric procedure explained in previous chapter.

## CHAPTER 5

### DATA ANALYSIS

#### 5.1 Introduction

This chapter presents the analysis of the data. Section 5.2 is analysis of Multiple Linear Regression where to examine the influence of selected variable towards of WLFPR. While in section 5.3 discusses the result on Granger Causality Test where to examine the relationship between WLFPR and TFR.

#### 5.2 Multiple Linear Regression

Table 5.1 indicates that there a long run relationship exists in the six variables. The estimated cointegrating vector has theoretically plausible coefficients. The long run relationship may be written as:

$$\begin{aligned} LRWLFPR_{it} = & 359.7606 + 0.007433Ed_{it} + 3.984864TFR_{it} - 3.27Gdp_{it} - \\ & 6.635160Pop_{it} - 0.120075Uem_{it} - 0.220375FW_{it} + \epsilon_{it} \dots\dots\dots (5.1) \end{aligned}$$

In OLS, the  $R^2$  coefficient of determination is a statistical measure of how well the regression line approximates the real data points. An  $R^2$  value 0.345082 in the OLS test indicates that the regression line perfectly fits the data.

The equation (5.1), indicates that higher in education and total fertility rate yield positive influence on the WLFPR in Malaysian labor market in the long run with estimated elasticity of 0.007433 and 3.984864 respectively. In other words, when 1% increase in education will lead to an increase in WLFPR for about 0.007433%. On the other hand, when there is a 1% increase in TFR, WLFPR will increase for about 3.984864%.

While, the GDP, population, unemployment and foreign worker yield the negative influence on WLFPR in Malaysian labor market where is the estimated elasticity of -3.27, -6.635160, -0.120075 and - 0.220375 respectively.

Table 5.1 : Multiple Linear Regression

Variable	Coefficient	t- statistic	Probability
C	359.7606	2.650394	0.0143
Edu_dgre	0.007433	2.063153	0.0506*
Fert_rate	3.984864	0.822815	0.4191
GDP	-3.27E-06	-0.374944	0.7111
Unemp_r	-0.120075	-0.548763	0.5885
Pop_f	-6.635160	-2.264112	0.0333**
FW	-0.220375	-1.255576	0.2219
R-squared	0.345082		

Note: \*, \*\* significant at 5% and 10% significance level

### 5.3 Relationship between WLFPR and TFR

#### 5.3.1 Unit Root Test

A unit root test is important to test whether a time series data or variable is non-stationary or not. Based on ADF test, unit root tests is employed to test for the stationary of the macroeconomic series at level and the first difference of each series.

Stationary test is important for time series data since this test will help to avoid spurious regression. Table shows a result for unit root tests of all variable in this study. All of variable in this study is expected to not stationary at level but stationary at first differentiation.

From the table 5.2, we can see that Augmented Dickey-Fuller (ADF) test can be divided into two part for both level and first differentiation which is constant and constant and trend. Based on table the t-statistic for all variables is statistically insignificant to reject the null hypothesis of non-stationary at significance level. This result indicates that these are non-stationary at level. Therefore, this study concludes that these variables contain unit roots. ADF test at first difference must reject the null hypothesis of non-stationary at 5 percent significance level, so all variable are integrated of order one, I(1).

Table 5.2 : Unit root Test

Variable	LEVEL		FIRST DIFFERENCE	
	Constant	Constant & Trend	Constant	Constant & Trend
<b>Education</b>	4.972309 ( -2.967767 )	0.665966 ( -3.574244 )	2.881788 ( -2.971853 )	3.631602** ( -3.612199 )
<b>TFR</b>	1.046643 ( -2.976263 )	2.362192 ( -3.587527 )	1.772982 ( -2.976263 )	0.869224 ( -3.587527 )
<b>GDP</b>	2.577561 ( -2.981038 )	1.483902 ( -3.5877527 )	3.737262** ( -2.981038 )	5.229786* ( -3.595026 )
<b>Population</b>	1.627047 ( -2.971853 )	0.044687 ( -3.612199 )	4.432616** ( -2.971853 )	4.773258** ( -3.612199 )
<b>Unemployment</b>	1.573903 ( -2.967767 )	2.159140 ( -3.574244 )	6.191140* ( -2.971853 )	6.076286* ( -3.580623 )
<b>Foreign Worker</b>	0.616688 ( -2.967767 )	1.994710 ( -3.574244 )	5.241900* ( -2.971853 )	5.167559* ( -3.580623 )

Note : \*,\*\* indicates the rejection of null hypothesis of non-stationary at 5% and 10% significance level.

( ) indicates the critical value at 5% significance level

### 5.3.2 Cointegration Test

After the data was tested for stationary based on ADF next test is to assess test for the existence of cointegration. This is important to see the relationship between the variables in this study and estimate long run function by using the Johansen (1988). If the result shows at least one cointegrated vector in the model, it will prove that there is a long run relationship between variable.

Table 5.3 showing the result of the Cointegration test between the selected variables where is at the 5% significance level. This is clearly showing that the variable are cointegrated or have long run relationship at least one cointegration equation. The trace test indicates four cointegrating equations at the 5% significance level. The P value equal to 7.22% means that is more than 5%.

Table 5.3 : Cointegration Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
$r \geq 0^*$	0.980670	235.5772	95.75366	0.0000
$r \geq 1^*$	0.862569	132.9787	69.81889	0.0000
$r \geq 2^*$	0.795786	81.37814	47.85613	0.0000
$r \geq 3^*$	0.627271	40.07484	29.79707	0.0023
$r \geq 4^{**}$	0.322160	14.41531	15.49471	0.0722
$r \geq 5^*$	0.152607	4.305358	3.841466	0.0380

Note :\*\* Trace test indicates 4 cointegrating equations at the 5% significance level

\* denotes rejection of the hypothesis at the 0.05 level

### **5.3.3 Granger Causality Test**

Granger causality is performed to see the causality between two variables that are being analyzed. This analysis would like to see the direction of the causality and identify which variable where Granger cause the other variables.

The result in table 5.4 shows that the null hypothesis that WLFPR does not Granger cause TFR is failed to be rejected since the p-value is bigger than any significance level (1, 5 and 10 percent) thus concluding that TFR does not Granger cause WLFPR.

On the other hand, the null hypothesis that WLFPR does not Granger cause TFR also failed to be rejected at 5 percent significance level. The p-value is 27.41%, so its more than 5%. The tests conducted show that TFR and WLFPR are cointegrated and the results from the Granger Causality tests indicate that there are no direction of causality is from WLFPR to TFR.

Table 5.4: Pairwise Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.
FERT_RTE does not Granger Cause WLFPR	28	0.84985	0.4405
WLFPR does not Granger Cause FERT_RTE		1.36982	0.2741

Note : Lag 2

#### 5.4 Conclusion

This chapter is devoted in analyzing the empirical model as discussed in Chapter 3 where to find out the possible answer for the objective of this study. Based on the findings in section 5.2, the multiple linear regressions' result show there are positive and negative influence of selected variable towards of WLFPR. While, in section 5.3 where this study has proven that there are no causal relationship between WLFPR and TFR. The Granger Causality test also shows that TFR does not Granger cause WLFPR

## **CHAPTER 6**

### **CONCLUSION**

#### **6.1 Introduction**

In this chapter, Section 6.2 provides about the conclusion and discussion of study. Section 6.3 is about Limitation of the study and the last Section is about the suggestion for the further study.

#### **6.2 Conclusion and Discussion**

This study firstly explores the trend of WLFPR with the six selected variable which is education, TFR, unemployment rate, GDP, population rate of female and also foreign worker over the period of 1982 to 2011 for our country. The results shows that there are certain pattern of connection among the variables and WLFPR. For example is the study found that WLFPR and TFR are correlated with each other in which when WLFPR increases, TFR decreases.

The second objectives to see the influence of each variables towards of WLFPR. The results indicates that higher in education and total fertility rate yield positive influence on the WLFPR in Malaysian labor market in the long run. However, GDP, population, unemployment and foreign worker yield the negative influence on WLFPR in Malaysian labor market. Besides that, the multiple linear regression show that only education and population is significant while the others is not significant at 1, 5 and 10 percent significance level. Because of there is only two significant variables, means that WLFPR not influenced by macro variables, but may be more influenced by micro variables. Some examples of micro variables such a household decisions, women interest, wage rate and household income. The wage rate and number of children aged 18 years and above have positive significant impact on the probability to work, while husband's income and number of children aged below six years have significant negative impact on married women's decision to participate in the labor force. Interestingly, this study suggests that an increase in the costs of childcare significantly affects the labor supply of married Malaysian women (Norehan et al.,2012).

No doubt that the education sector plays a critical role in its development. This can be proved by some analysis done of education affect significantly the amount of individual income. Thus, continuous efforts to improve the structure and education system need to be done to ensure the stability of the country's earnings. Higher revenues could help to improve the socio-economic level of individuals and thus help towards competitiveness in

the current challenging economic environment. The implementation of the New Economic Policy (NEP) in Malaysia put education as an important tool in the fight against poverty and restructuring of society. The purpose of education is to bridge the NEP education and economic disparities between the Bumiputra community non-Bumiputra community (Malaysia,2004). An increasing in women education's level appears to be one of the main factors of women contribution in labor force.

Education is essential to the improvement of women's living standards and to allow them to take a more active part in the decision making process within the family, the community, the place of paid work and the political area. Besides that, this study also examines the causal relationship between WLFPR and TFR. The results show that there is no causality which runs from WLFPR to TFR and TFR to WLFPR.

The decision made by policymakers in country is based on the objective that want to achieve. For instance, if the country wants to focus on increased economic development, it should optimize on human resources by reducing unemployment. Most important, the findings of this study can help on the confirming the implementation the best policies will increase women participation in labor market. The government and NGOs should play their role to overcome the challenges and problems faced in addition to strengthening the quality of women workers in Malaysia again.

The policies implemented by the government will increase the participation rate of women in the labor market. Therefore, important for the government in developing the right policies in order to avoid lack of women in the employment sector. To ensure that these measures are carried out effectively, all parties, including NGOs must work together to increase the participation of women in the employment sector in Malaysia.

The analysis shows that there is an issue with the participation gap between the sexes in this country. This problem must be addressed immediately to avoid it becoming more serious. Women should be given equal opportunities with men in the labor market. Sentiment women less productive at work should be abolished because of commitment to their work is the main thing to concern.

### **6.3 Limitation of Study**

The limitation of this study is that the analysis only observes the WLFPR with macroeconomic variables. Future studies may include the microeconomic variables since the findings of study only found that education and population influence WLFPR. More interestingly, future research may add the causal relationship other than WLFPR and TFR since the results show that there is no causality which runs from WLFPR to TFR and TFR to WLFPR.

### **6.4 Suggestion For Further Study**

In this study, time series data has been used for estimation. However, there are some econometric methods which are more appropriate and beneficial to use. So, to make the study more beneficial, future researcher could attempt to perform the application of Vector Autoregressive Regression (VAR) method to generate impulse response function and variance decomposition to trace the influence of education, fertility, population, unemployment, GDP and foreign worker towards of women labor force participation rate in Malaysian labor market.

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