EFFECT OF FERTILITY RATE ON FEMALE LABOR PARTICIPATION AND ECONOMIC GROWTH IN SELECTED ASIAN COUNTRIES

BY

NAWALIN NAZAH

A dissertation submitted in fulfilment of the requirement for the degree of Doctor of Philosophy in Economics

Kulliyyah of Economics and Management Science
International Islamic University Malaysia

JUNE 2022

ABSTRACT

Fertility has been experiencing a significant decline all over the world including in Asian countries as a result of rapid social and economic development. It is important to know what factors determine the fertility rates and their effects on female labor participation and economic growth to support the population program in each country. This study attempts to review the fertility condition and replacement fertility as well as investigates factors that influence fertility rates, and their consequences on female labor and economic growth in 27 Asian countries from the period 1990 to 2018. The finding of replacement fertility showed different results across countries depending on the country's characteristics against the general assumption which has an equal value at 2.1. The determinants of fertility rate include female labor force participation, infant mortality, cost of raising children, income, and female education. This study found that a factor reducing the fertility rate is the increasing cost of raising children, while female labor participation and income affect positively. Interestingly, infant mortality and female education are not significant in affecting fertility. Simultaneously, the effect of fertility on female labor force participation revealed that fertility significantly reduces female labor participation in the short run, while female education positively affects female labor participation in the long run. For the last objective on fertility and economic growth, in the linear model, low fertility is found to lead to higher economic growth. Furthermore, for the fertility-labor interaction model, the coefficients of its interaction are negative. The negative coefficient of fertility-labor interaction means a reduction in fertility rate yields a greater increase in economic growth with a higher level of labor participation and the effect of changes in labor participation on economic growth will depend on the level of fertility in the country. Several recommendations are suggested for the policymakers to maintain the fertility rates do not fall under replacement fertility or too high as both will create problems. The policymakers in low fertility countries are advised to encourage people to enter marriage life and ensure the availability and accessibility to the basic needs of children especially for health and education, so people will not have to worry about having more children. While in high fertility countries, the policymaker needs to control family planning programs and provide better public health facilities. The provision of accessible and affordable childcare and removing the barrier to re-entering the labor market for female workers are important to support and motivate females to participate in the labor force.

ملخص البحث

شهدت الخصوبة نقضاً كبيراً في أنحاء العالم فيما تشمل الدول الآسيوية نتيجة لتطوّر اجتماعيّ واقتصاديّ سريع. والمهمّ هو معرفة ماهية العوامل التي تحدّد معدّلات الخصوبة وتأثيراتها على مشاركة الإناث في العمل والنموّ الاقتصاديّ لدعم البرنامج السكّانيّ في كلّ دولة. تسعى هذه الدراسة إلى تقويم حالة الخصوبة والخصوبة الإحلالية كما تفحص العوامل التي تؤثّر على معّدلات الخصوبة وآثار الخصوبة في العمّالة النسائيّة والنموّ الاقتصاديّ في سبعة وعشرين من الدول الآسيويّة من فترة 1990م إلى 2018م. أظهرت حقيقة الخصوبة الإحلالية نتيجة مختلفة على نطاق هذه الدول تبعاً لمميّزات الدولة عكس الافتراض العام ذي القيمة المتساوية في 2.1. وتشمل العوامل المحدّدة لمعدّل الخصوبة مشاركة الإناث في القوى العاملة ووفيات الرضيع وتكلفة رعاية الأطفال والدخل وتعليم الإناث. ووجدت الدراسة أن العامل الذي يقلل معدّل الخصوبة هو ارتفاع تكلفة رعاية الأطفال، بينما مشاركة الإناث في العمل والدخل تؤثر على معدّل الخصوبة بشكل إيجابي. ومن المثير للاهتمام أن وفيات الرضيع وتعليم الإناث ليست مهمة في التأثير على الخصوبة. وفي الوقت نفسه، أشار تأثير الخصوبة على مشاركة الإناث في القوى العاملة إلى أن الخصوبة تقلّل بشكل ملموس مشاركة الإناث في العمل على الأمد القريب، بينما يؤثر تعليم الإناث بشكل إيجابي على مشاركة الإناث في العمل على الأمد البعيد. وبالنسبة للهدف الأخير المتعلق بالخصوبة والنمو الاقتصادي في النموذج الخطي، فيُلحظ أن الخصوبة المنخفضة تودّي إلى أعلى النموّ الاقتصاديّ. علاوة على ذلك، بالنسبة لنموذج التفاعل بين الخصوبة والعمل، فإن معاملات تفاعله سلبية. ويراد المعامل السلبي للتفاعل بين الخصوبة والعمل بأن انخفاض في معدل الخصوبة ينتج عنه زيادة أكبر في النمو الاقتصادي مع مستوى أعلى من مشاركة العمل وسيعتمد تأثير التغيرات في مشاركة العمل

للنمو الاقتصادي على مستوى الخصوبة في الدولة. وتمّ اقتراح بعض التوصيات لصنّاع القرار للحفاظ على معدّلات الخصوبة لكي لا تنزل إلى ما دون مستوى الخصوبة الإحلالية ولا ترفع إلى ما فوقه حيث كلا المستويان سيسبّب المشاكل. ويُنصح صنّاع القرار في الدول ذات الخصوبة المنخفضة بتشجيع الناس على دخول الحياة الزوجيّة وضمان التوفّر وإمكانيّة الوصول إلى الاحتياجات الأساسيّة للأطفال ولا سيّما الصحّة والتعليم، ومن ثمّ لا داعي للناس للقلق عن إنجاب المزيد من الأطفال. بينما في الدول ذات الخصوبة المرتفعة، يجب على صانع القرار التحكم في برامج تنظيم الأسرة وتوفير أفضل مرافق الصحة العامة. توفّر رعاية الأطفال الميسورة ومعقولة التكلفة وإزالة الحاجز في إعادة دخول سوق العمل للعاملات مهمّ لدعم وتحفيز الإناث للمشاركة في قوّة العمل.

APPROVAL PAGE

The dissertation of Nawalin Nazah has been approved by the following:

Jarita Duasa
Supervisor

Muhammad Irwan Arifin
Co-supervisor

Rafia Afroz
Internal Examiner

Law Siong Hook
External Examiner

Nursilah Ahmad
External Examiner

Ainul Jaria Maidin
Chairman

DECLARATION

I hereby declare that this dissertation is the result of my own investigations, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions.

Nawalin Nazah

Signature  Date: ….14 July 2022……

INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA

DECLARATION OF COPYRIGHT AND AFFIRMATION OF FAIR USE OF UNPUBLISHED RESEARCH

EFFECT OF FERTILITY RATE ON FEMALE LABOR PARTICIPATION AND ECONOMIC GROWTH IN SELECTED ASIAN COUNTRIES

I declare that the copyright holder of this thesis/dissertation are jointly owned by the student and IIUM.

No part of this unpublished research may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise without prior written permission of the copyright holder except as provided below

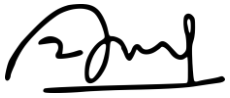
1. Any material contained in or derived from this unpublished research may only be used by others in their writing with due acknowledgement.

2. IIUM or its library will have the right to make and transmit copies (print or electronic) for institutional and academic purpose.

3. The IIUM library will have the right to make, store in a retrieval system and supply copies of this unpublished research if requested by other universities and research libraries.

By signing this form, I acknowledged that I have read and understand the IIUM Intellectual Property Right and Commercialization policy.

Affirmed by Nawalin Nazah



…… ……14 July 2022……..

Signature Date

This dissertation is dedicated to

My beloved husband Ahmad Jahro Chabibi

My beloved Children, Muhammad Mikhail Habibi, Muhammad Muaz Habibi, and Tsabita Orlin Habibi

And my beloved parents, H. Zainal Abidin and Hj. Mujenah

ACKNOWLEDGEMENTS

In the name of Allah, the most gracious and the most merciful.

All glory is due to Allah, the Almighty, whose Grace and Mercies have been with me throughout the duration of my journey. Although it has been challenging, His Mercies and Blessing help me in completing this dissertation.

I would like to take this opportunity to express my deepest gratitude to my supervisor Prof. Dr. Jarita Duasa and Asst. Prof. Dr. Muhammad Irwan Arifin for their valuable advice, guidance, support, suggestions, and kindness during my research works. Without their supervision and continuous help, this dissertation would not have been possible.

My grateful to all the lecturers at the Department of Economics who teach me valuable knowledge. My appreciation also goes PG Units staffs who always help me Ka Suriawati, and Ka Hasliya. I also owe the greatest intellectual debt to Dr. Gairuzazmi Mat Ghani, Prof. Dr Mansor Ibrahim, Prof. Andrew F. Hayes, Prof. M. Hashem Pesaran and Prof. Ron Smith for the valuable discussion, and assistance even though in a far distance however willing to give some insight during my consultations.

I am also indebted to my best friends during my PhD, Suziraha, Villaphone (Aisyah), Diyah Putriani, Mba Tami, Anhar, Mba Rahma, Faizah Syihab, Sufiana, Mba Dewi, and Mba Rini who always give me motivation, help, and company me during up and down. I also thank to sister Safiyyah who kindly help me to do Arabic translation.

In addition, I would like to express my deepest gratefulness to my Husband, and my children for their supports, doa, motivation, sacrifice, understanding and patience in companying me during my PhD.

I am infinitely grateful to my parents, who always give their best support. I am eternally indebted for all your genuine love and doa. May Allah bless both of you in this world and hereafter. My Brothers and Sisters, Mba Anih, Mba Ifah, Mba Uci, Mba Elis, Mas Nanang, Mas Heri, and Koni, and all of my family nieces and my nephews for all of your supports and doa.

Finally, May Allah grant everyone mentioned and those I could not mentioned happiness in this world and hereafter, Amin.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND OF STUDY

Fertility is one of the major components of population growth and age structure change. The fertility rate can be defined as the average total of offspring born to a woman if she were to live to the end of her childbearing period. This rate becomes important in the discussion of the demographic issue because it gives information about the future of the people concerned. The total fertility rate also has a big impact on the socio-economic condition of a nation. For instance, by understanding the level and trend of fertility, the decision-maker can take appropriate steps to prepare suitable policies for a country. In a populous country, low fertility can play a good role to accelerate economic growth. On the contrary, in a developed country where the rate is too low, the policymaker needs to set appropriate strategies encouraging people to increase the number of fertility to prevent the country from problems caused by low fertility such as shortage of labor and aging population which in turn, would result in the country's difficulty in sustaining economically.

Nowadays, the interest of people to have children has decreased substantially. As reported by World Bank (2018), the average number of children in a family is just below 2.5 children per woman which equals half of the numbers from 50 years ago as depicted in Figure 1.1. The mortality rate was very high at a young age, thus people tend to have more children to ensure the children will survive up to adulthood. The lack of access to family programs and contraception knowledge also contributed to the high fertility rate. As health improved, the rates of mortality were reduced, thus leading to a gradual decline in the fertility rate. Recently, the fertility rate has declined to two children per woman (Roser,

2018). To visualize, Figure 1.1 depicts the decline of the world average fertility rates from 1960 to 2017.

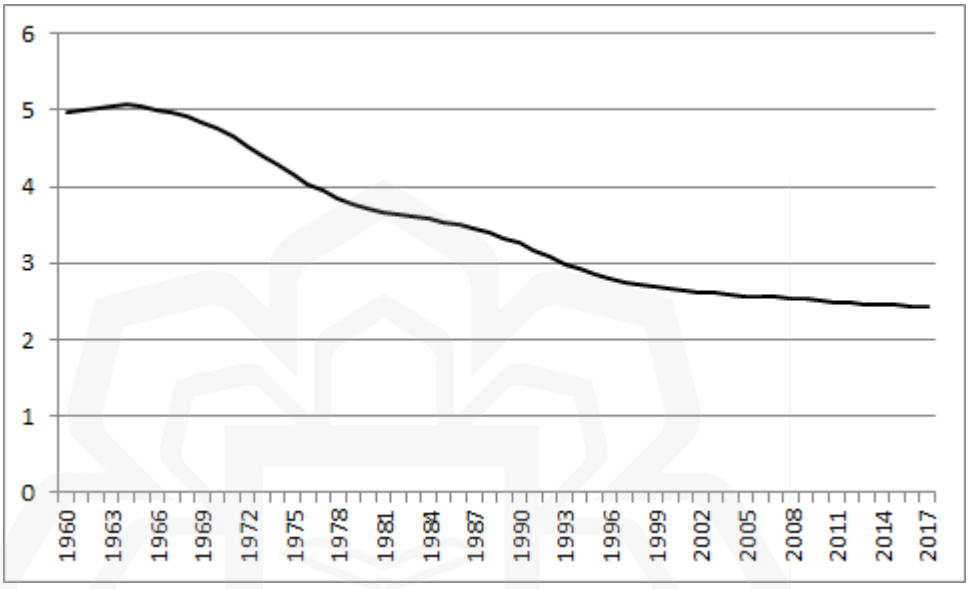


Figure 1.1 World Average Fertility Rates

Source: World Bank, (2018)

Data from the United Nation Population Division (2017) showed that in 1975-1980, almost a quarter of the world's population lived with an average of five children per woman, while it was only eight percent in 2010-2015. Furthermore, the number of countries with fertility below 2.1 increased significantly from 21 percent of the world's population to slightly more than double in 2010-2015 and is expected to reach more than three times of the world's population in 2045-2050 as presented in Figure 1.2.

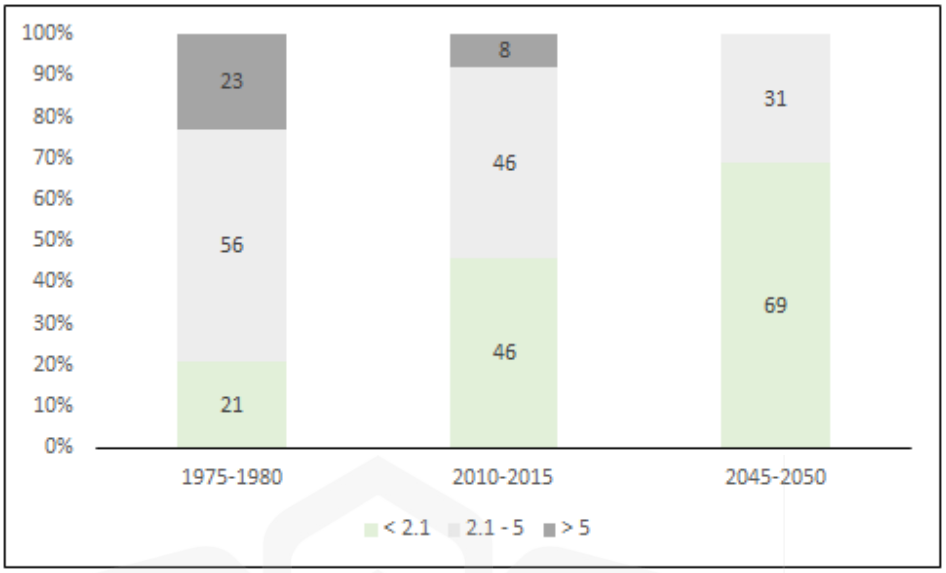


Figure 1.2 Distribution of the World's Population by Level of Fertility

Source: United Nation Population Division (2017).

Low fertility rates do not necessarily imply the inability to produce offspring, but rather it could be due to other reasons such as the preference of fertile people to have fewer or no children at all. In addition, another issue associated with fertility is replacement fertility which is frequently misunderstood as a constant 2.1 children per woman, therefore this study will discuss replacement fertility as this term is very important for every country to understand. Considering this background, a better knowledge of fertility is therefore required as it would have a significant impact on the country's population, economy, and labor supply. Besides discussing replacement fertility, this present study also aims to analyze factors influencing fertility rate, and the impact of fertility rate on female labor force participation as well as economic growth in selected Asian countries.

1.2 PROBLEM STATEMENT

Both high and low fertility have consequences. Higher fertility leads to higher populations that require more homes, infrastructures, jobs, and provision of their needs. The high growth of the population may cause drops in capital per worker and lesser the standards of living, thus a large number of the investment is utilized to accommodate the necessity of the high population rather than increase the quality of provision per capita (United Nations, 2014). On the other hand, in the long term, low fertility will cause population aging, a shortage of labor, an increased dependency ratio, and raise the reliance of countries on in-migration to meet the needs of the labor market (United Nations, 2014).

Nowadays, the decline in fertility is happening at a different level in Asian countries. For instant, Singapore is having a very high number of late marriages and non-marriage. The government of Singapore has formed some policies toward encouragement of marriage such as matchmaking programs, providing subsidized housing that is eligible for a married couple while singlehood is discouraged to purchase unless they must be over the age of 35 years (Jones, 2012). Furthermore, since 2000, Japan's fertility has fluctuated between 1.3 to 1.4 which then led to extreme population aging and even population decline. Many Japanese will grow old with no children to take care of them, as a consequence, the low number of working people are paying high-income taxes to bear the health care cost of the old people, so their purchasing power goes down, and it creates the societal problem (Tsuya, 2017).

It is important to recognize what are the significant factors that determine fertility rates and it is also essential to explore the consequences of fertility on female labor participation and economic growth to encourage an effective population program in each country. Furthermore, the assumption of the replacement fertility which is universally at an average of 2.1 is questioned and needs to investigate as argued by Espenshade et al (2004) the values for replacement fertility are highly country-specific.

For the above reason, this study, therefore, proposed an approach to investigate factors that determine fertility as well as the effect of fertility on female labor participation and economic growth in 27 selected ASIAN countries with a variety of analysis such as panel ARDL which consist of PMG, MG, and DFE analysis, as well as CCEMG and AMG for robustness check for considering the presence of cross-sectional dependence. In addition, the interaction term and also demean interaction for robustness check to ensure the result is unaltered to investigate the effect of fertility on economic growth also becomes an interesting point to be considered. These analyses rarely have been used in the previous studies on fertility. For example, studies on the determinant of fertility by Hashmi & Mok (2013) in Singapore using a survey method found that age marriage influence fertility negatively, while per capita income exhibited a U-shaped relationship as found by Kamaruddin & Khalili (2015) as well as Tang & Tey (2017) for the case of Malaysia. The study on determinants of fertility for some ASEAN countries found by Lai et al. (2017) for Cambodia, Indonesia, and the Philippines using microdata have found that contraceptive use and delayed marriage contribute to fertility decline. Moreover, the association between fertility and female labor participation was discussed in Lim (2017) in Malaysia, Shittu & Abdullah (2019) in ASEAN-7, and Subramaniam et al. (2018) in ASEAN-5 reported that fertility has an inverse relation with female labor participation. Meanwhile, the study on fertility and economic growth such as Barro (1991, 1996, 1998), Brander & Dowrick (1994), and Ashraf et al. (2013), show identical results stating that fertility is negatively related to economic growth.

The scope of this study is also quite large as compared to previous studies which only involve a few countries that are less suitable for panel data analysis. The inclusion of many countries is aimed to accommodate the heterogeneity caused by different conditions of the countries which are also infrequently discussed by other studies. Hence, this study proposed a comprehensive explanation of replacement fertility and discussed factors that may lead countries to be below-replacement fertility which was absent from the previous studies (Espenshade et al. (2004), Smallwood & Chamberlain (2005), and Engelman and Leahy (2006). This study also analyzed factors determining fertility as well as its consequences on female labor participation and economic growth in 27 selected Asian countries.

1.3 RESEARCH QUESTIONS

This research is concerned with the following questions:

1. What are the levels of replacement fertility in selected Asian countries?
2. What significant factors determine the fertility rate in selected Asian countries?
3. How do the fertility rates affect the female labor participation in selected Asian countries and does a causal relationship exist between the fertility rate and the female labor force participation?
4. How do fertility rates affect economic growth in selected Asian countries?

1.4 RESEARCH OBJECTIVES

The study aimed to achieve the following objectives:

1. To calculate the replacement fertility of selected Asian countries;
2. To examine the determinants of fertility rate in selected Asian countries;
3. To analyze the impact of fertility rate on the female labor force in selected Asian countries and investigate the causality relationship between fertility rate and female labor force; and
4. To examine the effects of fertility rate on economic growth in selected Asian countries.

1.5 SIGNIFICANCE OF THE STUDY

Fertility reduction was seen as an essential strategy for the development of a nation and poverty alleviation during the 1960s and 1970s. However, currently, low fertility has

become a serious concern in many countries, especially in the East Asia region which may lead to population aging and labor shortage. A comprehensive understanding of fertility, therefore, is required to design proper policies to prevent a further decline in low fertility countries, and formulate the right policies to improve reproductive health through planned parenthood, especially for high birth rate countries.

This study provides more knowledge about Asian countries, particularly demographic issues, and economic conditions. Furthermore, this research can furnish more information about the replacement fertility for each country as this topic is rarely discussed in the previous studies except in Espenshade et al. (2004), Smallwood & Chamberlain (2005), and Engelman and Leahy (2006). This study discussed factors that may lead countries to be below-replacement fertility which were absent from the three above studies. The discussion on the level of replacement fertility becomes important as essentially, the levels vary among countries instead of a single number due to the difference in female young mortality. The replacement fertility rate is useful to represent the health condition of a country.

This study also contributed to the academic literature. The application of panel ARDL that has not been widely used for analyzing fertility studies has many advantages. Some of the advantages are it provides alternative models where the selection is based on the Hausman test. The estimation of DFE gives homogeneous coefficients for both long-run and short-run for all countries in the panel, while it contradicts with the MG estimation where the coefficients are heterogeneous for all countries for both short-run and long-run, and allows the combination of homogeneous coefficients as well as the heterogeneous slope in the long-run and short-run respectively for PMG estimation. Moreover, for robustness check, this study also applied CCEMG and AMG for considering the presence of cross sectional dependence. The interaction and demean method of interaction also become interesting point to be considered in the discussion of fertility-labor in affecting economic growth. The scope of the study is also quiet large as compare to previous studies which only involved a few countries that are less suitable for panel analysis.

Previous studies on determinant fertility from a macroeconomic aspect focused on a specific country using time series approaches such as Narayan (2006) in Taiwan, Narayan & Peng (2006) in China using cointegration analysis, Tang & Tey (2017) in Malaysia using generalized variance decomposition analysis in addition to cointegration analysis, and Subramanian et al. (2015) in ASEAN-5. Furthermore, studies on fertility and female labor that utilized panel causality and panel ARDL were found in Subramanian et al. (2018) in ASEAN-5 and Shittu & Abdullah (2018) in ASEAN-7. However, these studies used a small number of countries which is less suitable for a panel data analysis. Even though Bloom et al. (2009) involved a large number of countries, the study employed a different approach using abortion as an instrument variable as well as simulation. Studies on fertility and economic growth such as in Barro (1991, 1996, 1998) using OLS regression, Brander & Dowrick (1994) using OLS regression, and Ashraf et al. (2013) using simulation. This study, therefore, makes up for the shortcomings of the previous studies.

1.6 SCOPE AND LIMITATION OF STUDY

Fertility is a topic that relates to many sectors such as social, health, cultural, economic, and other fields. However, this research only considered the discussion of replacement fertility, socioeconomic determinants of fertility, and the effects of fertility on female labor force participation and economic growth. Data used in this study is panel data with the number of observations N is 27 Asian countries and period $T = 29$ from 1990 to 2018 with some variables are unbalanced data such as real GDP per capita, gross fix capital formation, and consumer price index, while other variables are balanced panel data. The discussion of replacement fertility however involved 44 Asian countries, rather than 27 countries to capture as much information on replacement fertility as possible. Table 1.1 presents the list of selected Asian countries, countries in bold letters are the addition for the analysis of replacement fertility.