

# Socio-economic Development and the Role of Fiscal Decentralisation in Malaysia

by

Yusniliyana Yusof

Submitted in fulfilment of the requirements for the degree of  
Doctor of Philosophy  
of the Australian National University  
October 2018



THE AUSTRALIAN NATIONAL UNIVERSITY

## Candidate's Declaration

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university. To the best of the author's knowledge, it contains no material previously published or written by another person, except where due reference is made in the text.

Yusniliyana Yusof

Date: 27 April 2018

# Acknowledgements

I dedicate this thesis to my father, Yusof Mohamad and my mother, Murni Abdul Rahman who have always stood behind me during the journey of my PhD. Their passionate encouragement and financial support have been my strong determination to complete the thesis.

I would like to convey my greatest gratitude and ‘thank you’ to my supervisory chair, Prof. Kaliappa Kalirajan who has supervised me on my PhD project and guided me through the process of life. I have learnt a lot from him from academic point of view and other aspects of life. His calmness and firmness in handling the tense situations have been a precious learning experience that I could apply during my lifespan. His humble attitude with his superior knowledge made me realised that my PhD project is just a stepping stone to explore more valuable part of knowledge in this lifetime. I am forever thankful for his mentorship and guidance.

I also would like to sincerely thank to thesis advisors, Assoc. Prof. Tatsuyoshi Okimoto and Prof. Raghendra Jha for their generosity of time and expertise in imparting valuable advice for the improvement of the thesis.

I am also thankful to my dearest Muhammad Yusri Ashif Muhammad Othmarani who stands with me during ups and downs of my graduate life and cheer me with such loving support and good humour. I thank my other family members at large for all the love and moral support throughout my PhD journey and every part of my life.

My gratitude to my officemate, Arif Kazi Zaman who has put up with the noise and mess up that I have sometimes made during the office time. I am also thankful to him for sharing his brilliant opinion and advice regarding my PhD project.

I would also like to thank you to my friend, Diana Anuar Musa who offered her kindness in giving me an accommodation to stay at her place during my financial hardship. I also thank her for the time that she gave in accompanying me during my preparation for the oral presentation.

I would also like to express my appreciations to all my PhD colleagues and friends for their encouragement, support and friendship throughout the PhD journey.

To my sponsors, the Malaysian Ministry of Higher Education and the International Islamic University of Malaysia, a big ‘thank you’ for giving the opportunity and trusting in me in pursuing higher research degree at the Australian

National University. My sincere thanks are due to the academic and administrative staff of the Crawford School of Public Policy at the Australian National University.

# Abstract

Malaysia is one of the countries in the world that has adopted a unique system of governance that involves monarchy, democracy and federal system. Nevertheless, all the thirteen states are governed by employing a federal governance structure headed by the Prime Minister. Given the federal structure of Malaysian economy, it is logical to expect the variations in the socio-economic development across the states. It is interesting and also important to understand the force behind the variations across the performance of the states. This thesis first identifies the significant factors that influence the variation in economic growth across the states, which is the core factor determining socio-economic development. Next, the thesis highlights the influence of the federal system on the development expenditure of the states, which is crucial for socio-economic development. Finally, the thesis examines the impact of decentralisation on transferring the Malaysian economy from the middle-income country to high-income country. The following paragraphs briefly explain how the above three main analyses have been carried out in this thesis.

In Chapter 2, the study contributes to the aim of regional development policy in reducing regional disparities, by examining the spatial balance in socio-economic development across the states of Malaysia based on few selected socio-economic indicators. Besides, the study has attempted to understand the issues in the development gaps across the Malaysian states by evaluating the factors that explained the variation in economic growth. Though the pattern in the spatial socio-economic imbalance demonstrates a decreasing trend, the development index reveals that performance of less developed states remained behind that of the developed states for more than a decade. Based on three-stage least squares (3SLS) estimation technique, all independent variables in the main equation are significant to explain the development gaps within the states that covers the period between 2005 and 2015. The significant factors in explaining the variation in growth across the Malaysian states are relating to agriculture, manufacturing, human capital, population growth, Chinese ethnic, institutional factors and natural resources.

In Chapter 3, the study examines whether there is convergence in development expenditure across Malaysian states and investigates the importance of decentralisation in affecting the pattern of development expenditure during the short run and long run. The convergence analysis involved the data of annual growth for the short run, and

average three-year and five-year growth for the long run from 2000 to 2015. The study uses panel data approaches of pooled OLS, fixed effects and random effects estimation procedures. The findings provide empirical evidence on the development expenditure convergence within the states during both short run and long run. It is also found that all fiscal decentralisation indicators (state per capita revenue, state-sourced per capita revenue, state-sourced revenue as a share of total revenue and state-sourced capacity as a share of the national average) are imperative in influencing the fiscal behaviour of state governments in Malaysia. The assistance from the federal government through transfer payment is needed to strengthen the expenditure capacity of Malaysian states.

In Chapter 4, the study inspects the role of fiscal decentralisation as a solution for escaping from the middle-income trap. The study employed annual time series data from 1985 to 2015. The Autoregressive Distributed Lag (ARDL) bounds test reveals the presence of long run relationship between the levels of the dependent variable (economic growth) and the regressors (the participation of federal, state and local governments in the economy, labour force and net exports). The results of the study offer a possible solution that could help Malaysia to escape from the stagnant economic growth. It is found that fiscal decentralisation has a growth effect on Malaysian economy though the benefits of decentralisation are realised differently at different levels of government. The positive impact of revenue decentralisation is realised at the state but not the local level. In contrast, the opposite results are reported in the case of expenditure decentralisation. The benefits of expenditure decentralisation are accomplished at local but not the state level.

# Table of Contents

<b>Candidate's Declaration.....</b>	<b>iii</b>
<b>Acknowledgements.....</b>	<b>iv</b>
<b>Abstract .....</b>	<b>vi</b>
<b>Table of Contents.....</b>	<b>viii</b>
<b>List of Figures.....</b>	<b>x</b>
<b>List of Tables.....</b>	<b>x</b>
<b>Chapter 1: Background to the study.....</b>	<b>1</b>
1.1 Overview of the Malaysian economy.....	1
1.2 Problem statement.....	3
1.3 Objectives of the study.....	6
1.4 Structure of the thesis.....	7
References	
<b>Chapter 2: Factors that affect the variation in economic growth across states in Malaysia.....</b>	<b>10</b>
2.1 Introduction.....	11
2.2 Spatial balance in socio-economic development across Malaysian states.....	14
2.3 Literature review on factors that explain variation in economic growth.....	20
2.4 Methodology.....	27
2.4.1 Regression framework.....	27
2.4.2 Data and variables.....	29
2.4.3 Sources of data.....	30
2.5 Findings and discussion.....	32
2.6 Conclusion and policy recommendations.....	38
References	
<b>Chapter 3: Fiscal decentralisation and convergence in government spending.....</b>	<b>50</b>



3.1	Introduction.....	51
3.2	Federation of Malaysia.....	52
3.3	Convergence in state government expenditures.....	55
3.4	Methodology.....	60
3.4.1	Data and sources of data.....	60
3.4.2	Model and specifications.....	60
3.4.3	Regression framework.....	62
3.5	Findings and discussion.....	63
3.6	Conclusion and policy recommendations.....	70
References		
<b>Chapter 4: Does fiscal decentralisation promote economic growth?.....</b>		<b>76</b>
4.1	Introduction.....	77
4.2	Theoretical arguments for and against fiscal decentralisation.....	80
4.3	Empirical evidence on fiscal decentralisation and economic growth.....	85
4.4	Methodology.....	96
4.4.1	Data, variables and sources of data.....	96
4.4.2	Model and specifications.....	97
4.5	Findings and discussion.....	99
4.6	Conclusion and policy recommendations.....	109
References		
<b>Chapter 5: Conclusion and implications of the study.....</b>		<b>118</b>
<b>Appendix .....</b>		<b>122</b>
Appendix 1.1.....		122

## *List of Figures*

<b>Figure 1.1:</b> Per capita GDP in US dollars.....	1
<b>Figure 2.1:</b> GDP growth of the Malaysian economy.....	11
<b>Figure 3.1:</b> Growth rate of development expenditure between developed and less developed states.....	59
<b>Figure 3.2:</b> Horizontal balance among developed states .....	72
<b>Figure 3.3:</b> Horizontal balance among less developed states.....	72
<b>Figure 4.1:</b> Federal and subnational governments' shares of total public-sector revenue .....	79
<b>Figure 4.2:</b> Federal and subnational governments' shares of total public-sector expenditure .....	79
<b>Figure 4.3:</b> Data of variables from 1985 to 2015.....	101
<b>Figure 4.4:</b> Lag selection model: revenue decentralisation .....	103
<b>Figure 4.5:</b> Lag selection model: expenditure decentralisation .....	103
<b>Figure 4.6:</b> CUSUM test: revenue decentralisation .....	109
<b>Figure 4.7:</b> CUSUMQ test: revenue decentralisation.....	109
<b>Figure 4.8:</b> CUSUM test: expenditure decentralisation .....	109
<b>Figure 4.9:</b> CUSUMQ test: expenditure decentralisation.....	109

## *List of Tables*

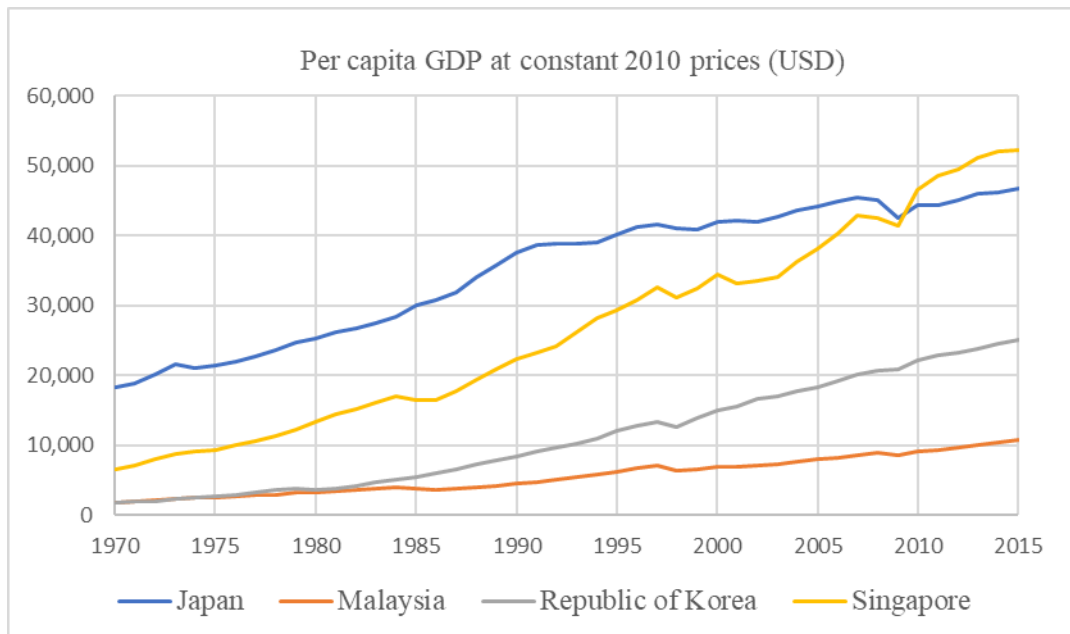
<b>Table 2.1:</b> GDP growth by state and nationally during 2006 to 2015.....	13
<b>Table 2.2:</b> The Malaysian Well-Being Index, 2000-2012 .....	15
<b>Table 2.3:</b> Composite Development Index by state, 1990-2005.....	17
<b>Table 2.4:</b> Average development index and total dispersion in states' development indices.....	17
<b>Table 2.5:</b> Socio-economic development indicators.....	18
<b>Table 2.6:</b> Variables and their measurement.....	30
<b>Table 2.7:</b> 3SLS estimation result: factors that explain the variation of the economic growth across states (13 states from 2005 to 2015).....	33

<b>Table 2.8:</b> Post estimation tests .....	38
<b>Table 3.1:</b> Distribution of legislative powers between Federation and states.....	54
<b>Table 3.2:</b> Absolute or unconditional convergence: 2000 to 2015.....	64
<b>Table 3.3:</b> Conditional convergence in government development expenditure (annual growth).....	65
<b>Table 3.4:</b> Conditional convergence in government development expenditure (three-year average growth) .....	66
<b>Table 3.5:</b> Conditional convergence in government development expenditure (five-year average growth) .....	67
<b>Table 4.1:</b> Descriptive statistics of variables.....	100
<b>Table 4.2:</b> Unit root tests.....	102
<b>Table 4.3:</b> Bounds testing: ARDL F-bounds test (unrestrictive constant and restrictive trend).....	104
<b>Table 4.4:</b> Long-run relationships and error correction term (ECM): revenue decentralisation.....	105
<b>Table 4.5:</b> Long-run relationships and error correction term (ECM): expenditure decentralisation.....	106
<b>Table 4.6:</b> Diagnostic tests.....	108

# Chapter 1: Background to the study

## 1.1 Overview of the Malaysian economy

Malaysian per capita income which is measured by Gross Domestic Product (GDP), has been increasing steadily every year. A recent report by the United Nations highlighted that Malaysian per capita income increased from USD 10740 in 2015 to USD 11032 in 2016. The growth of Malaysian GDP has been slow compared to high-income countries in the Asian region. Figure 1.1 shows the relative performance of the per capita GDP of Malaysia against selected high-income Asian countries. In the 1970s, Malaysia and Korea had similar level of per capita GDP, but from 1982 onwards, Korea reported higher GDP comparatively. From 1987 to 1997, Malaysian GDP showed continuous growth of 7 to 10 percent to reach middle-income status. However, slower growth at an average of 4 to 5.5 percent in the 2000s has challenged the country's efforts to achieve high-income-nation status by 2020. Malaysia has taken several initiatives and implemented reliable policies, which are worth exploring. The following briefly discusses the development stages of the Malaysian economy.



Source: United Nations Statistics Division

**Figure 1.1: Per capita GDP in US dollars**

Since its independence in 1957, the Malaysian economy has been depending heavily on rubber and tin for resource-based development. This has accounted for about 70 percent of export earnings and 36 percent of total employment. Within the post-independence period (1957 to 1970), Malaysia was an export-oriented economy that focused on expanding and diversifying agricultural production and other commodities such as palm oil, logs, and petroleum. However, a consistent decline in the prices of commodities, especially rubber, reduced the country's income and enhanced the need for industrialisation. On average, the GDP growth was about 6 percent during the period of 1957 to 1970, where the private sector was the main contributor to the economy.

From 1971 to 1990, the government applied a policy known as New Economy Policy (NEP) to eradicate poverty and promote unity among the multiracial society in Malaysia. The policy was established because of racial riots in May 1969. Pertaining to imbalance in the racial structure of the economy, several efforts were initiated to enhance the involvement of Bumiputra (indigenous people) in commercial and industrial activities, and to reduce income disparity among the ethnic groups. With an imbalanced ratio of 2.4: 34.3: 63.3 between the Bumiputra's, other Malaysians' and foreigners' holdings, respectively, in 1970, the NEP targeted corporate structure equity, aiming to reach a target ratio of 30: 40: 30 by 1990. Although it did not achieve the target, the outcome was a substantial increase in equity ownership, with Bumiputra holdings amounting to 19.3 percent, those of other Malaysians to 46.8 percent, and foreign and nominee holdings to 33.9 percent. The poverty rate fell to 16.5 percent by 1990, from 49.3 percent in 1970. Given the evidence of economic growth and the reduction in ethnic inequality, it appears that Malaysia experienced important growth in equity between 1970 and 1990 (Mahadevan 2006).

In the 1980s, structural economic reform was significantly crucial to GDP growth. Growth in industry became a substantial part of the economy due to an increase in international trade. From 1990 to 1994, the combination of total exports and total imports accounted for about 74 percent of GDP, as compared to 46 percent between 1980 and 1984. By 1995, Malaysia had become the nineteenth largest exporter and seventeenth largest importer in the world, with both per capita exports and imports higher than major exporters and importers such as Australia and the USA (Tan & Arif 1999)<sup>1</sup>. Manufacturing became a dominant sector, and its contribution to the Malaysian

---

<sup>1</sup>In 1995, Malaysian per capita exports and imports were USD 3895 and USD 4090 respectively. Meanwhile, the per capita exports of Australia and the USA were USD 2944 and USD 2237 respectively, and the per capita imports of those countries USD 3328 and USD 2953 respectively.

economy replaced agricultural production since 1987. Its share in GDP increased significantly to 27 percent in 1990 as compared to 19.7 percent during 1985 (Sixth Malaysia Plan 1990-1995). Manufacturing has become a major sector of the economy, dominated by total exports. The share of manufacturing within total exports increased from 58.8 percent in 1990 to 79.6 percent in 1995 (Seventh Malaysia Plan 1996-2000).

Despite its domestic production, Malaysia could not escape from external shocks. For instance, in 1997, the Malaysian economy was affected by the Asian Financial Crisis, which caused a drop in Malaysian GDP to 7 percent during the year 1998. Malaysia managed the crisis with efficient monetary and fiscal policy decisions. Malaysian GDP also declined in the year 2009 because of the global financial crisis in 2008. However, with a stable financial market and reliable policies implemented by the Central Bank, Malaysia has maintained the inflation rate and stability in the economy. Since the Asian Crisis, the average growth rate of Malaysian GDP has been about 5.5 percent, hindering Malaysia's attempts to reach high-income status. As reported by Kok (2015), the Malaysian government claimed that under the 10<sup>th</sup> Malaysia Plan (2011-2015), the country needed to have 6 percent growth per year in GDP to achieve its Vision 2020. However, the average growth of GDP under the 10<sup>th</sup> Malaysia Plan was below the 6 percent target, leading to a very challenging phase of development planning under the 11<sup>th</sup> Malaysia Plan (2016-2020) if Malaysia is to realise its goal of becoming a high-income nation.

## **1.2 Problem statement**

Malaysia consists of thirteen states and three federal territories, with four regions, known as Central, Northern, Eastern and West Malaysia. Hence, the fluctuation in Malaysia's GDP at the aggregate level reflects the economic performance of these thirteen states as well as the three federal territories. The level of economic performance across the states can be observed from per capita gross domestic product of state (GSDP). Higher variation in the GSDP means higher gaps in the level of development across the states of Malaysia. It is important for policymakers to have a clear picture of the variation in the level of development between the states, so that relevant policies can be made. Moreover, in Malaysia, the development gaps between less developed and more developed states have been an issue over the years. Rulers and policymakers must

try to reduce development gaps between states by assimilating all the factors that lead to variation in economic growth.

To become a high-income nation, Malaysia is aiming to achieve sustainable and inclusive growth, which not only emphasises the economic sector but also social welfare. Part of the Malaysian development strategy is the focus on regional development. One of the issues of regional development is a spatial imbalance in socio-economic development across the regions and states. The disparity in socio-economic development might be due to variations in the level of income and the structure of society. With better income, the developed states are likely to have better socio-economic development than the less developed states. Based on this, the high variation in economic performance, measured by GSDP, implies a higher dispersion in socio-economic development across the states. In line with sustainable development goals, it is essential to investigate how variation in GSDP may affect variation in socio-economic development across Malaysia.

Balance in socio-economic development in an equitable society occurs when each state is entitled to similar levels of public services, such as education, health, action against crime, housing and other infrastructure. The government plays a leading role in providing the society with these services that are implemented based on its expenditure policy. Government spending can reduce spatial inequality, either directly or indirectly. Investment in human capital development and quality of living directly affects government spending. The indirect effect is based on the promotion of a conducive environment that may encourage private investment. Such activities could promote employment and improve regional economic performance, hence narrowing regional gaps (Faguet & Shami 2008). In short, a spatial balance in socio-economic development might be a result of a fair distribution of government spending across states. Hence, examining the pattern of government expenditure can explain the disparity in socio-economic development between states in Malaysia.

Balance in regional economic development also depends on the quality of institutions (Rodríguez-Pose 2013; Ezcurra & Rodríguez-Pose 2014). Within a nation, the competency of a similar package of policies can vary across states or jurisdictions based on differences in the quality of institutions. Structurally, a government is usually divided into central and subnational governments. Since independence, the Malaysian Constitution has empowered local administrative institutions based on two tiers of

structures, between the federal and state levels. The stage of development varies across states as a result of an institutional factor, decentralisation. Though all forms of decentralisation are interconnected, fiscal decentralisation has posed the main challenge to the development process, as it relates closely to development expenditure.

There are very few empirical studies that examine the relationship between fiscal decentralisation and development outcomes in Malaysia. Previous studies have discussed fiscal imbalances and equalisation schemes of transfers (Anuar 2000; Wilson 1996; Umikalsum 1991), along with the issue of intergovernmental transfers and public service efficiency (Abdul Jalil & Abdul Karim 2009). Meanwhile, Abdul Jalil (2012) investigates the effect of political structures on state governments' fiscal behaviour. No study, to the best knowledge of the researcher, has quantified the differences in the growth of development expenditure between developed and less developed states. Therefore, this study attempts to examine whether the expenditure distribution across states in Malaysia is likely to be 'converging' or 'diverging' over time and investigates how the institutional factor of fiscal decentralisation affects the pattern of development expenditure within Malaysian states.

Decentralisation is not just relevant for local development but also for the national level as a whole. Previous empirical studies have found positive impacts of fiscal decentralisation on economic growth at the national level (e.g., Gemmell, Kneller & Sanz 2013; Rodríguez-Pose & Krøijer 2009). The basic argument in favour of fiscal decentralisation is that it promotes a more efficient use of resources, which positively affects productivity and growth (Oates 1993). The recent situation shows that Malaysia has faced moderate economic growth for about a decade, which has hindered the country's efforts to become a high-income nation<sup>2</sup>. Fiscal decentralisation as a significant factor in economic growth offers a possible solution that could help Malaysia to escape from the middle-income trap and stagnant economic growth. In this context, it is worth examining the effect of fiscal decentralisation on the Malaysian economy.

---

<sup>2</sup> Refer to Figure 1.1



### 1.3 Objectives of the study

The discussion in the previous section has motivated this study to analyse economic development in Malaysia. Specifically, this study aims at examining the factors that influence the variation in economic growth across Malaysian states. Next, the study attempts to investigate how the variation in GSDP could affect the patterns of disparity of socio-economic development across Malaysian states. In order to have a clear view on the spatial distribution of socio-economic development between states in Malaysia, this study examines the pattern of inter-state differences in the growth of development expenditure, by analysing whether the expenditure distribution across states in Malaysia is likely to be 'converging' or 'diverging' over time. As the quality of institutions might affect a spatial balance of regional economic development, this study also aims to investigate how the institutional factor of decentralisation affects the pattern of development expenditure within Malaysian states. Lastly, the study examines how fiscal decentralisation affects the economic growth of Malaysia. In light of the above, the main objectives of the study are as follows<sup>3</sup>:

RO1: To examine the factors that affect variation in the growth of Malaysian states

RO2: To examine how variation in economic performance affects the trend in socio-economic development across states in Malaysia

RO3: To examine whether the expenditure distribution across developed states and less-developed states in Malaysia is likely to be 'converging' or 'diverging' over time

RO4: To analyse whether fiscal decentralisation indicators have an impact on the pattern of development expenditure across Malaysian states

RO5: To examine the effect of fiscal decentralisation on the economic growth of Malaysia

In order to achieve these objectives, the following research questions are raised in the study<sup>4</sup>:

RQ1: What are the factors that affect variation in the growth of Malaysian states?

RQ2: How does variation in economic performance affect the trend in socio-economic development across states in Malaysia?

---

<sup>3</sup> RO denotes research objective of the study.

<sup>4</sup> RQ represents research question of the study.

RQ3: What is the pattern of the expenditure distribution across developed and less developed states in Malaysia across time?

RQ4: How could fiscal decentralisation affect the pattern of development expenditure across Malaysian states?

RQ5: How does the degree of fiscal decentralisation affect the economic growth of Malaysia?

#### **1.4 Structure of the thesis**

This dissertation consists of five chapters. This chapter covers the introductory part of the study. It begins with an overview of the Malaysian economy followed by a problem statement, the research objectives and the research questions of the study. The research questions of the study are answered in three essays contained in the following three chapters.

Chapter 2 covers the first essay of the dissertation and attempts to answer RQ1 and RQ2. This chapter examines the factors that affect variation in the growth of Malaysian states and how variation in economic performance affects the trend in socio-economic development across states in Malaysia. The study uses three-stage least squares (3SLS) estimation and descriptive analysis in answering the two research questions respectively. All independent variables, relating to agriculture, manufacturing, human capital, population growth, Chinese ethnicity, institutional factors and natural resources, are significant in explaining the variation in growth across the Malaysian states.

Chapter 3 contains the second essay of the dissertation. This chapter analyses RQ3 and RQ4. The study examines whether there is convergence in development expenditure and investigates how fiscal decentralisation affects the pattern of development expenditure across Malaysian states. For this analysis, the study applies a Fixed Effect (FE) model. The results reveal that fiscal decentralisation has fostered equitable spatial development through convergence of development expenditure.

Chapter 4 contains the third essay of the dissertation, attempting to answer RQ5, which analyses how the degree of fiscal decentralisation affects the economic growth of Malaysia. Here, the study uses the Autoregressive Distributive Lag (ARDL) model in examining the effect of fiscal decentralisation on economic growth. The findings

indicate that fiscal decentralisation is imperative as a driving factor of economic growth.

Chapter 5 presents the conclusion of the dissertation. This chapter provides a summary of the findings, policy recommendations and directions for future research.

## References

Abdul Jalil, AZ & Abdul Karim, NAH 2009, 'Understanding Malaysian state governments fiscal behavior: the role of intergovernmental transfers', Munich Personal RePEc Archive, no. 25188, University Library of Munich, Germany.

Abdul Jalil, AZ 2012, 'The political structures and subnational government's fiscal behavior in Malaysia', *Procedia Economics and Finance*, vol. 1, pp. 203-212.

Anuar, AR 2000, 'Fiscal decentralization in Malaysia', *Hitotsubashi Journal of Economics*, vol. 41, no. 2, pp. 85-95.

Economic Planning Unit 1990, *Sixth Malaysian Plan Report, 1990-1995*, Prime Minister's Department Malaysia

Economic Planning Unit 1996, *Seven Malaysian Plan Report, 1996-2000*, Prime Minister's Department Malaysia

Ezcurra, R & Rodríguez-Pose, A 2014, 'Government quality and spatial inequality: a cross-country analysis', *Environment and Planning A*, vol. 46, no.7, pp. 1732-1753.

Faguet, JP & Shami, M 2008, 'Fiscal policy and spatial inequality in Latin America and beyond', Policy research working paper series, The World Bank, Washington, DC, USA.

Gemmell, N, Kneller, R & Sanz, I 2013, 'Fiscal decentralization and economic growth: spending versus revenue decentralization', *Economic Inquiry*, vol. 51, no. 4, pp. 1915-1931.

Kok, C 2015, 'With 5 years to go Govt getting feedback to achieve Vision 2020', The Star (online), 5 January, viewed 20 February 2015, <<https://www.thestar.com.my/business/business-news/2015/01/05/a-critical-11mp-with-five-years-to-go-govt-getting-feedback-to-achieve-vision-2020-targets/>>

Mahadevan, R 2006, 'Growth with equity: the Malaysian case', *Asia Pacific Development Journal*, vol. 13, no. 1, pp. 27-52.

Oates, WE 1993, 'Fiscal decentralization and economic development', *National Tax Journal*, vol. 46, no. 2, pp. 237-243.

Rodríguez-Pose A & Krøijer, A 2009, 'Fiscal decentralization and economic growth in Central and Eastern Europe', *Growth and Change*, vol. 40, no. 3, pp. 387-417

Rodríguez-Pose, A 2013, 'Do institutions matter for regional development?', *Regional Studies*, vol. 47, no.7, pp. 1034-1047.

Tan, EC & Ariff, M 1999, 'External trade and economic growth: the Malaysian experience', in *International Trade Policy and the Pacific Rim*, Palgrave Macmillan, London, pp. 87-104.

Umikalsum, MN 1991, '*Fiscal Federalism in Malaysia, 1971-1987*', PhD thesis, University of Malaya

United Nations Statistics Division, National Accounts Main Aggregates Database.

Wilson, LS 1996, '*Federal-State fiscal arrangements in Malaysia; State revenue equalization in Malaysia*', John Deutsch Institute for the Study of Economic Policy, Queen's University.

## **Chapter 2: Factors that affect the variation in economic growth across states in Malaysia**

### **Abstract**

The study contributes to the aim of regional development policy in reducing regional disparities, by examining the spatial balance in socio-economic development across the states of Malaysia based on few selected socio-economic indicators. Besides, the study has attempted to understand the issues in the development gaps across Malaysian states by evaluating the factors that explain the variation in economic growth. The pattern in the spatial socio-economic imbalance demonstrates a decreasing trend; the development index reveals that performance of less developed states remained behind of the developed states. Based on three-stage least squares (3SLS) and bootstrap sampling and estimation techniques, all independent variables in the main equation are significant to explain the development gaps within the states that between 2005 and 2015. The significant factors in explaining the variation in growth across the Malaysian states are relating to agriculture, manufacturing, human capital, population growth, Chinese ethnicity, institutional factors and natural resources.

## 2.1 Introduction

Malaysia experienced high growth during the 1990s because of structural changes that moved the focus of the economy from the agricultural to the industrial sector. The growth rate of Malaysia was above 8 percent and at times close to 10 percent between the years 1986 and 1996, prior to the recessionary period of 1997-1998 that was due to the Asian Financial Crisis. Following the 2000s, the growth rate became moderate at 5.11 percent on average<sup>5</sup>. This moderate growth rate has challenged Malaysia's attempts to reach high-income status by 2020. Figure 2.1 below shows the GDP growth of the Malaysian economy.



Author's calculation: GDP growth at constant price (2010=100)<sup>6</sup>

**Figure 2.1: GDP growth of the Malaysian economy**

The fluctuation in Malaysian economic growth reflects the variation in economic growth at the state level, which is shown in Table 2.1 (GDP growth). The table groups the states into more developed and less developed states categories based on Composite Development Index (CDI) criteria. Starting 2001, the Malaysian government has used CDI to measure the level of development of Malaysian states. The index comprised of ten socio-economic indicators. The social indicators are poverty incidence, population provided with piped water, population provided with electricity, infant mortality rate per 1,000 live births and number of doctors per 10,000 population

<sup>5</sup> Refer to Figure 2.1

<sup>6</sup> Data is retrieved from Economic Planning Unit of Prime Ministers, <http://www.epu.gov.my/ms/statistik-ekonomi/akaun-negara>

Meanwhile, the economic indicators are per capita GDP, unemployment rate, urbanisation rate, registered cars and motorcycles per 1,000 population and telephone per 1,000 population. The states of Johor, Melaka, Negeri Sembilan, Perak, Pulau Pinang, and Selangor and Federal Territory of Kuala Lumpur are categorised as more developed states while Kedah, Kelantan, Pahang, Perlis, Sabah, Sarawak and Terengganu are recognized as less developed states based on Composite Development Index (Economic Planning Unit, Ninth Malaysia Plan Report and Third Outline Perspective Plan of Malaysia)

In Table 2.1, the highlighted cells show years when states had higher GDP growth than the national growth level. The table indicates that there is an inconsistent trend and some variations in the growth rate across Malaysian states, which have a significant influence on overall national growth. Some less developed states, namely Sabah, Sarawak, Terengganu and Perlis, have experienced a lower than average growth rate for many periods. Meanwhile, other less developed states, such as Kedah, Kelantan and Pahang, have experienced some improvements, with their GDPs being above the national average at least four times within the period of 2006 to 2015. More interestingly, Kelantan came in third place after Selangor and Malacca in terms of average state growth over the whole period of 2006 to 2015, higher than the national average, based on GDP performance. The average growth for all developed states except for Negeri Sembilan was higher than the national average during this ten-year period. Overall, the average growth in the GDP of the Malaysian states during the 2006 to 2015 period was between 3.43 and 6.43 percent, while the average national growth was 4.91 percent.

**Table 2.1: GDP growth by state and nationally during 2006 to 2015**

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Average
Developed states											
Johor	4.96	4.08	4.22	-3.02	9.79	6.54	6.47	4.67	6.47	5.57	4.97
Malacca	8.53	6.67	4.75	1.22	6.59	5.37	7.02	2.41	7.65	5.47	5.57
Negeri Sembilan	9.21	5.22	4.31	0.62	5.77	5.88	5.99	2.85	3.07	4.38	4.73
Pulau Pinang	10.76	6.51	5.46	-10.5	10.4	5.44	4.52	5.09	7.98	5.47	5.11
Perak	6.58	5.04	6.48	-1.09	5.74	7	7.36	5.25	4.62	5.93	5.29
Selangor	4.98	7.87	9.13	-0.46	11.85	5.47	7.19	5.84	6.73	5.73	6.43
Less developed states											
Kedah	8	9.23	0.84	-0.55	4.3	8.15	5.6	4.8	4.17	5.55	5.01
Kelantan	6.94	8.53	6.88	2.08	4.85	7.06	5.19	3.29	5.03	3.54	5.34
Pahang	7.08	2.08	4.99	-0.99	4.89	6.35	4.98	5.38	4.13	4.41	4.33
Perlis	3.51	7.2	2.95	-2.58	4.8	2.66	5.03	3.34	5.07	2.31	3.43
Terengganu	8.39	7.44	2.09	-4.22	4.33	3.25	3.33	4.26	6.08	3.33	3.83
Sabah	5.53	3.21	10.8	4.79	2.72	2.09	3.17	3.27	4.98	6.09	4.66
Sarawak	4.45	8.33	0.29	-1.98	4.32	6.39	1.42	4.34	4.31	3.66	3.55
Malaysia	5.85	6.48	4.81	-1.64	7.19	5.29	5.47	4.69	6.01	4.97	4.91

Author's calculation<sup>7</sup>

Although there is a significant growth at the national level, it may be unevenly distributed among the regions, which is a concern for policymakers for two reasons (Kanbur & Venables 2005). First, regional inequality is significant in influencing national inequality. *Ceteris paribus*, national inequality goes up when there is an increase in spatial inequality. Second, geographical regions can be associated with political, ethnic, language or religious divisions. The persistent weakness of certain divisions of the society may cause significant social costs to the country. Nevertheless, resolving the issue of spatial inequality is not as simple as suggested by the literature (Kim 2008). The difference in the economic fortunes and social structure of different societies challenges attempts to achieve spatial balance in economic development. In this regard, how variation in economic performance affects trends in socio-economic development across states is of interest in the current study. Implicitly, an increase in economic growth or income increases the welfare of a society. This reasoning implies that variations in the socio-economic welfare of a society will increase as variations in

<sup>7</sup> Data were retrieved from the Economic Planning Unit of Prime Ministers, <http://www.epu.gov.my/ms/statistik-ekonomi/akaun-negara>



growth across states increase. Therefore, understanding the reasons for the variation in growth is necessary to reducing the disparity in development between the states.

The regional development policy aims to reduce regional disparities by improving economic activities among regions. National policymakers and international organisations have strived to find solutions to issues such as rural-urban income disparities, the formal versus the informal sector, etc. (Prantilla 1981). Spatial balance in regional development may not necessarily be one of the main determinants of national growth, but it is a necessary condition for a nation to achieve sustainable development goals for people to share the benefits of growth equally. The following section overviews the spatial balance in socio-economic development across the states of Malaysia.

## **2.2 Spatial balance in socio-economic development across Malaysian states**

Malaysia, aspiring to reach high-income status by 2020, has targeted sustainable and inclusive growth, by means of a government development programme that is people-centric and aims to maximise social welfare. The Eleventh Malaysia Plan (11<sup>th</sup> MP - 2016 to 2020) is a crucial step in the quest to become an advanced nation. It highlights six thrusts that aim at promoting inclusiveness and equity among society, enhancing the well-being of the people, speeding the development of human capital, pursuing green growth, strengthening infrastructure, and promoting innovation and productivity. It has been reported that socio-economic status increased during the Tenth Malaysia Plan (10<sup>th</sup> MP-2011 to 2015). A reduction in the Gini coefficient to 0.401 in 2014 from 0.441 in 2009, and an increase in the mean monthly household income of the bottom 40 percent of households, from RM 1440 in 2009 to RM 2537 in 2014, provides evidence of an improvement in Malaysian socioeconomic status.

Besides, The Malaysian Well-Being Index (MWI), which presents both economic and social well-being sub-composite indices, also improved over the period from 2000 to 2012, by 25.4 points (Malaysian Well-Being Report 2013)<sup>8</sup>. Table 2.2 provides the details of performance in each component of MWI during 2012 as compared to 2000 as a base year. The sub-composite index of economic well-being increased by 33.33 points, with an average annual growth rate of 2.4 percent, whereas

---

<sup>8</sup> There are five elements in the economic well-being sub-component index (communications, education, distribution of income, transport and employment life). Meanwhile, there are nine elements in the sub-component of social well-being (family, governance, health, housing, culture, environment, leisure, public security and social involvement).

the social well-being sub-composite index improved by 21 points, with a growth rate of 1.6 percent per annum. Overall, both the transport and housing sectors saw the greatest improvement, increasing by 36.9 points each, while the family sector showed the least improvement, with 4.6 incremental points. Regardless of these enhancements, more attention needs to be paid to ensure spatial balance in economic and social well-being across regions, states and individuals, to achieve equity and equality within society.

**Table 2.2: The Malaysian Well-Being Index (MWI), 2000-2012**

Component	2000	2012	point change (2000-2012)
Malaysian Well-Being Index (points)	100	125.4	25.4
Economic Well-Being	100	133.33	33.33
-Transport	100	136.9	36.9
-Communications	100	136.2	36.2
-Education	100	132.9	32.9
-Employment life	100	128.6	38.6
-Income distribution	100	131.8	31.8
Social Well-Being	100	121	21
-Housing	100	136.9	36.9
-Leisure	100	131.4	31.4
-Governance	100	128.1	28.1
-Public security	100	125.6	25.6
-Social involvement	100	120.6	20.6
-Culture	100	120.3	20.3
-Health	100	114.1	14.1
-Environment	100	107.3	7.3
-Family	100	104.6	4.6

(Source: Malaysian Well-Being Report 2013)

Among the central aims of regional development, include improving the standard of living and quality of life and ensuring balanced social and economic development across regions and states. This study uses the Composite Development Index (CDI) that comprises the Economic and Social Development Indices to summarise the states' performance in Malaysia. The index is retrieved from the website of the Economic Planning Unit, Prime Minister's Department. This study also selects a few socio-economic indicators to represent the outcome of public service provision, with a specific focus on the areas of health, education and infrastructure. Health and education are key factors in the development of human capital, the improvement of these sectors therefore being necessary for the enhancement of productivity levels. Similarly, infrastructure such as power supplies, water supplies, communications and

transportation play a crucial role in connectivity, which affects both product and labour markets and overall levels of productivity.<sup>9</sup> This study uses secondary data from the Department of Statistics Malaysia Official Portal, selecting the following indicators to compare the variation in service outcomes at the subnational level. The indicators are; life expectancy at birth, infant mortality rate, literacy rate, per capita population served with piped water and per capita population served with electricity. The study involves thirteen states (Johor, Kedah, Kelantan, Malacca, Negeri Sembilan, Pahang, Perak, Perlis, Pulau Pinang, Sabah, Sarawak, Selangor and Terengganu) and the three federal territories (Kuala Lumpur, Putrajaya and Labuan). However, since the data on CDI is not available in the context of two federal territories (Putrajaya and Labuan), the discussion on CDI performance will exclude these two federal territories. This study also uses the weighted coefficient of variation as a measurement to examine the dispersion trends in basic social and economic development indicators across states in Malaysia. Analysing these indicators provides a picture of the spatial balance in socio-economic development across the states of Malaysia.

Table 2.3 shows the CDI for the thirteen states and the Federal Territory of Kuala Lumpur, based on the social and economic sub-components. The best-known area of Malaysia, the Federal Territory of Kuala Lumpur, has also remained the most developed over the years, with the highest CDI. The latest values, reflecting the progress of the Eight Malaysia Plan (2000-2005), show that the central region has outperformed the other regions in overall development. This region comprises Malacca, Negeri Sembilan, Selangor and the Federal Territory of Kuala Lumpur. Pulau Pinang, which is located in the northern region, has shown comparable performance. Meanwhile, the eastern region, which includes Kelantan, Pahang and Terengganu, along with the states of West Malaysia, Sabah and Sarawak, can be seen as the least developed regions, with low CDIs. The southern region contains only the state of Johor and the northern region states of Kedah, Perak and Perlis are between the eastern and central regions in terms of performance. The highest CDI observed for the Federal Territory of Kuala Lumpur shows that it has enjoyed the highest economic activity and quality of life, followed by Pulau Pinang, Malacca and Selangor.

---

<sup>9</sup> Improvements in connectivity reduce the transportation costs involved in production and encourage firms to specialise in areas where they possess a comparative advantage.

**Table 2.3: Composite Development Index by state, 1990-2005**

Index	Economic Development Index			Social Development Index			Composite Development Index		
	1990	2000	2005	1990	2000	2005	1990	2000	2005
Johor	102.9	131.6	102.9	102	134.3	98.1	102.2	132.9	100.5
Kedah	93.9	123.7	95.5	95.7	128.5	100.2	94.8	126.1	97.8
Kelantan	90.4	117.9	91.9	92.9	120.8	94.4	91.3	119.4	93.1
Malacca	100.8	131.7	106.4	106	132.5	102.1	103.2	132.1	104.2
Negeri Sembilan	100.7	129.7	101.8	105	134.1	102.9	102.8	131.9	102.3
Pahang	96.7	123.2	96.3	101	128.9	99	98.9	125.7	97.6
Perak	99.4	131	99.7	101	133	101.2	100	132	100.4
Perlis	94.9	123.2	95	98.7	128.5	104.9	96.8	125.8	99.9
Pulau Pinang	110.6	142.1	109	108	136.3	102.4	109.5	139.2	105.7
Sabah	89.9	117.1	82.9	83.6	110.4	100.8	86.8	113.8	96.2
Sarawak	92.6	122.1	94.8	89	126.2	97.2	90.8	124.2	90
Selangor	112.6	137.3	108.4	107	140.6	98	109.9	139	103.2
Terengganu	95.2	125	91.5	96.1	124.7	98.4	95.7	124.8	96.6
Federal Territory of Kuala Lumpur	116.8	145.4	114.4	116	134.7	104.8	116.2	140.1	109.6

Source: Economic Planning Unit, Ninth Malaysia Plan Report and Third Outline Perspective Plan of Malaysia.

The development gaps across the Malaysian states can be explained by the coefficient of variation (CV) of the index, as indicated in Table 2.4. Though the dispersion in the socio-economic development index is apparently high, the pattern in the spatial socio-economic imbalance shows a somewhat decreasing trend.

**Table 2.4: Average development index and total dispersion in states' development indices**

Development Index	Year	Average	CV
Economic Development Index	1990	100.52	0.9126
	2000	129.28	0.9043
	2005	99.74	0.9024
Social Development Index	1990	99.52	0.9133
	2000	130.04	0.9041
	2005	99.56	0.9036
Composite Development Index	1990	100.02	0.9122
	2000	129.66	0.9042
	2005	99.67	0.9021

Source: Author's calculation

More importantly, the quality of life in the Malaysian society has improved over this period through better access to education, healthcare, housing and other infrastructure. The variation in the pattern of development indicators in these areas across the thirteen states and three federal territories of Malaysia is reported in Table 2.5.

**Table 2.5: Socio-economic development indicators**

Life expectancy at birth (male)			Life expectancy at birth (female)			Infant mortality rate (per thousand live births)		
Year	Average	CV	Year	Average	CV	Year	Average	CV
2001	70.29	0.8944	2001	75	0.8947	2000	6.46	0.8807
2002	70.31	0.894	2002	75.08	0.8943	2001	6.81	0.8812
2003	70.45	0.8936	2003	75.37	0.8939	2002	7.19	0.8789
2004	70.77	0.8931	2004	75.7	0.8934	2003	7.01	0.877
2005	71.09	0.8927	2005	75.93	0.893	2004	6.97	0.8782
2006	71.23	0.8922	2006	76.01	0.8926	2005	7.07	0.8809
2007	71.29	0.8918	2007	76.04	0.8921	2006	6.63	0.8808
2008	71.25	0.8913	2008	76.04	0.8917	2007	6.59	0.8774
2009	71.36	0.8907	2009	76.16	0.8911	2008	6.66	0.8761
						2009	6.66	0.9092
						2011	6.45	0.9093
						2012	6.57	0.8982
						2013	6.06	0.8968

Literacy rate (%)			Population served with piped water (%)			Population served with electricity (%)		
Year	Average	CV	Year	Average	CV	Year	Average	CV
1980	72.2	0.1259	1980	58.8	0.3222	1980	49.9	0.3222
1991	85	0.0749	1985	69.9	0.2602	1985	71.3	0.2302
1995	89.9	0.0660	1990	80.1	0.1644	1990	83.8	0.2121
2000	91	0.0502	1995	89.1	0.1095	1995	95.8	0.0894
2010	95.2	0.0257	2000	92	0.1398	2009	99.3	0.0152
			2001	92.7	0.1329	2012	99.8	0.005
			2002	93.2	0.1123	2014	99.9	0.0014
			2009	93	0.1291			
			2012	94.7	0.1074			
			2013	95.1	0.0982			
			2014	95.3	0.094			

Source: Author's calculation

Greater access to health services as well as improvements in the level of health can be seen from the increase in life expectancy at birth and decrease in infant mortality rate. Table 2.5 shows evidence of improvement in Malaysian life expectancy for males and females over the years and a reduction in its dispersion across states and the federal territories. However, there are some fluctuations in the average infant mortality rate, with inconsistent variations over the years 2000 to 2010. Though the health indicators show a somewhat positive performance, the dispersion in access to health across states is still high at more than 0.8.

Regarding education, the literacy rate of Malaysian citizens aged ten years and over reached 95.2 percent in 2010, as compared to 91 percent in 2000. The increasing trend in the literacy rate suggests better access to all levels of education and improvements in the quality of education. Given the Federal Territory of Putrajaya recorded the highest literacy rate at 99.8 percent, and Sarawak the lowest, at 89.3 percent, in 2010, the disparity in educational performance has reduced to 2.57 percent compared to 5.02 percent in year 2000.

As for infrastructure, more than 90 percent of the population was provided with water and electricity in the most recent years as illustrated in Table 2.5. Moreover, the dispersion in these services shows a declining trend, with a variation of less than 10 percent across the states.

Though some development indicators demonstrate a decline in the disparity of spatial development outcomes, the development index indicates that the performance of less developed states was lower compared to developed states for many years. Given the concern over inter- and intra-regional imbalances, Malaysia has focused on regional economic corridor plans to address these issues and ensure local communities benefit from the development achieved in their region. The government has introduced plans for five corridors during the Mid-Term Review of the Ninth Malaysia Plan (Athukorala & Narayanan 2018). The Iskandar Malaysia (IM) in Johor Bahru focusses on development in southern Peninsular Malaysia and is managed by Iskandar Development Regional Authority (IRDA). The Northern Corridor Economic Region (NCER) comprising Pulau Pinang, Kedah, Perlis and Northern Perak. is managed by Northern Implementation Corridor Authority (NICA). On the other hand, Malaysia has established East Coast Economic Region (ECER) that concentrates on Kelantan, Terengganu, Pahang and district of Mersing in Johor, which is administered by East Coast Economic Region Development Council (ECERDC). Sabah Economic Development and Investment Authority (SEDIA), Sabah Development Corridor (SDC)

is established to promote economic development in Sabah. Lastly, Sarawak Corridor of Renewable Energy (SCORE) emphasises on development in central Sarawak. Regional Corridor Development Authority (RECODA) was set up to administer the SCORE corridor plan (MIDA 2018)<sup>10</sup>. Despite these initiatives, more actions are needed to ensure that the development gaps across states are narrowed and the pattern of socio-economic development is fairly distributed across states and local communities. Furthermore, the variation in economic growth between states must be ascertained based on the development gaps across states in Malaysia. The following section reviews the relevant literature on factors that affect economic growth.

### **2.3 Literature review on factors that explain variation in economic growth**

Studies on economic development have discussed extensively the contribution of different economic sectors to the economy. The agriculture sector is recognised as the backbone of the overall economic development of a country, enhancing the social income of rural people, providing food security, creating job opportunities and improving the well-being of society (Owens, Hoddinott & Kinsey 2003; Poonyth, Hassan, Kirsten & Calcaterra 2002). Sufficient agricultural products are necessary to maintain agricultural price stability in the economy as agricultural production increases export earnings. Evidence of agriculture-led economic growth can be found in previous empirical studies (e.g., Sertoglu, Ugural & Bekun 2017; Izuchukwu 2011; Katircioglu 2006). However, in the modern economy, the development pattern in developed and developing countries demonstrates the importance of the transition process from an agrarian to an industry-based economy. Kuznets (1966) claims that industrial revolution is a key to successful modern economic growth, featuring the reallocation of resources from traditional to modern activities.

Empirical evidence has supported the notion that an increase in industrialisation or share of manufacturing in the economy will promote higher economic growth for a country (e.g., Cantore, Clara, Lavopa & Soare 2017; Szirmai & Verspagen 2015; Hussin & Ching 2013; Sultan 2008; Chow 1993). The industrial sector can stimulate the creation of jobs, investment and innovation that increase productivity and growth of production. However, the growth of the agricultural sector further determines the growth of the industry, which can be realised in many ways. Agriculture plays a

---

<sup>10</sup> The links of each corridor plan can be retrieved from Malaysian Investment Development Authority (MIDA) official website to <http://www.mida.gov.my/home/malaysia-economic-corridors/posts/>

prominent role as the main supplier of raw materials and inputs for industrial production. Lewis (1954) discusses on the subsistence of agricultural sector as a source of cheap labour supply to the capitalist or industrial sector. Given an unlimited labour supply, the capitalist sector would use significant amount of labour, together with capital at the lowest marginal productivity of labour, or at a level that equals the current wage. The transferral of unused resources from agriculture to industry enhances the productivity of this labour. In this context, Lewis (1954) ignores the contribution of skilled workers to the expansion of the sector but claims that capital and natural resources are more important for facilitating the expansion of capitalist or industrial sectors. An increase in agriculture income also generates capital for the industrial sector through the terms of trade, and enhances the autonomous demand for industrial goods (Lewis 1954; Kuznet 1966; Poonyth, Hassan, Kirsten & Calcaterra 2002). In short, Hwa (1988) concludes that agriculture aids industrialisation through the supply of labour, capital and raw materials as inputs to other sectors, encourage the demand for industrial goods.

Similarly, industrial growth plays a crucial role in agricultural growth. Ranis and Fei (1961) highlight the interdependency between the industrial and agricultural sectors based on input and output approaches. Based on the input approach, the industrial sector can offer employment to the labour surplus that exists in agriculture. Meanwhile, the output approach propagates support from both the sectors through marketing outlets. According to Lewis (1954), industry and agriculture are complementary to each other, and economies with stagnant agriculture show less development in the industrial sector. Numerous studies have examined sectoral linkages and patterns of economic growth, and many have supported a positive relationship between industrialisation and the agriculture sector (Hwa 1988; Mellor 1995; Henneberry, Khan & Piewthongngam 2000; Singh & Kaur 2011). However, some researchers have provided evidence of negative linkage between these two sectors (Akpan, Udoka & Okon 2014; Subramaniam & Reed 2009; Gemmell, Lloyd, & Mathew 2000; Chenery, Syrquin & Elkingotn 1975). The law of comparative advantage (Matsuyama 1992 and Subramaniam & Reed 2009) can explain a negative linkage between industry and agriculture. The endogenous growth model by Matsuyama (1992) assumes that industry obtains labour inputs from agriculture, as there is low or no productivity in the agriculture sector. This situation causes higher employment in industries that could



stimulate higher productivity growth. Consequently, lower employment in agriculture adversely affects the output growth of the sector.

Earlier economists have emphasised the importance of human capital development to growth (Schultz 1961; Becker 1962). Schultz (1961) divides human capital investment activities that could improve human quality of living into five categories: (1) spending on health matters, (2) on-the-job training, (3) attaining formal education, (4) adults' study programmes and (5) migrating for better job opportunities. Theoretically, Becker (1962) shows how investment in job training, schooling, information and health enhances future earnings and raises the future productivity of the worker. Besides this, growth in human capital stock promotes better technology that can be achieved through education-intensive research and industry expansion. As growth in human capital is always strongly linked to development, this explains why research and development activities are more prominent in developed countries (Becker, Murphy & Tamura 1990). Mankiw, Romer and Weil (1992) augment the neoclassical growth model of Solow (1956) by adding either the rate of human capital accumulation or the level of human capital on the right-hand side of the equation. Focusing on education as a human capital investment, Mankiw et al. (1992) claim that education is one of the factors that explain cross-country variation in income per capita.

Some empirical studies provide evidence of a positive effect of human capital on economic growth in developed countries (e.g. Barro & Sala-i-Martin 1995; Jenkins 1995; Wilson & Briscoe 2004; Sonmez & Sener 2009), while others show the significant contributions of human capital to the growth of developing countries (e.g. Musibau & Rasak 2005; Sonmez & Sener 2009; Hanushek 2013; Arabi & Abdalla 2013). In contrast, based on the Cobb-Douglas production function, Benhabib and Spiegel (1994) report different findings from Mankiw et al. (1992). They use human capital stock, as estimated by Kyriacou (1991), and find that human capital has an insignificant effect on cross-country variation in per capita growth rates<sup>11</sup>. Temple (1999) argues that the effect of human capital is insignificant in cross-country studies as the samples used in those studies include countries that posit minimum impact of human capital on growth, which could influence the overall results of the analysis. However, other studies claim that the results regarding cross-country human capital

---

<sup>11</sup> The average years of schooling estimated by Kyriacou (1991) are a function of past values of human capital investment, i.e., enrolment in primary, secondary and tertiary education.

effect are due to a deficiency in the data and the measurement of human capital (Domenech 2006; Cuaresma & Lutz 2007). Overall, the findings on the effect of human capital on growth in cross-country analyses are mixed (Barro 1996; Bassanini & Scarpetta 2001; Lutz, Cuaresma & Sanderson 2008; Lee & Mason 2010; Pelinescu 2015; Wang & Liu 2016). The effect of human capital on economic growth has also been analysed by researchers at the regional or state level. Findings support the notion that human capital could also explain the spatial differences in per capita income or growth across regions or states (Rodriguez-Pose & Vilalta-Bufi 2005; Fleisher, Li & Zhao 2010; Manca 2012; Ramos, Surinach & Artis 2012).

Another factor that could explain the variation in per capita income is population. However, previous studies show no conclusive evidence of the effect of population on economic development or growth. There are three views on ways population might affect economic growth. The first supports a positive impact. A higher population could increase the labour supply in the economy by increasing per capita and aggregating output (Kuznets 1960; Simon 1981). Kuznets (1960) speculates that an increase in the labour force due to population growth encourages greater utilisation of unexploited resources and more specialisation in the division of labour. Consequently, productivity per worker increases, leading to higher per capita output. In line with Keynes's idea of the adverse outcomes of a stagnant labour force for the economic performance of developed Western countries, Kuznets (1960) also argues that a growing labour force induces greater mobility. Unlike the existing workers, new entrants to the labour force are more mobile and interested in those sectors; thus, able to enhance the economic growth of a country. Furthermore, knowledge is known to be the greatest factor in economic growth. Hence, the growth of a population is associated with the addition of new people with new knowledge, which could at least proportionately increase the stock of established knowledge. This would enhance the growth of per capita output. Among the previous findings that support this view are Kremer (1993), Kothare (1999), Ali, Ali and Amin (2013) and Tartiyus, Dauda and Peter (2015).

The second view with respect to the growth effect of the population has a negative effect on economic growth. This view is attributed to the Malthusian theory of population. Malthus (1798) argues that the ratio of increase of the population is not proportionate to the increase in food or human subsistence. The growth of the population increases geometrically but the means of sustenance increase arithmetically.

Thus, a rising population exerts pressure on limited resources and causes distress to labour, especially unskilled labour. This scenario would lower the productivity of a labourer as he or she would work harder to earn a similar amount. Besides this, an increase in the size of the population adversely affects capital formation, as households spend more on consumption than savings (Easterlin 1967). A reduction in capital resources would reduce or at least maintain the capital per labour. Stagnant capital per labour might lower the growth of output per labour or lower the output per capita in absolute value. Malthus (1798) recommends two ways of balancing growth in population with means of subsistence, termed ‘preventive’ and ‘positive’ checks<sup>12</sup>. References to the negative growth effect of the population can be found in previous studies by Solow (1956), Coale and Hoover (1958), Mankiw et al. (1992), Afzal (2009), Dao (2012) and Ahmad and Ahmad (2016).

In contrast to these two views, the other studies find that economic growth has nothing to do with population (Bloom & Freeman 1986; Simon 1989; Barlow 1994; Aidi, Emecheta & Ikenna 2016). The World Bank claims that the growth of population is not the primary cause of problems to do with limited natural resources. Besides this, a rising population does not immediately produce technological advancement that is crucial for the economic development of a country (World Development Report 1984). Simon (1989) reviews the body of literature that reports an absence of correlation between population growth and economic growth. The author reports that a plausible argument against this view is that it is due to the omission of one or more variables from the analysis. Besides this, the periods of observation are crucial in influencing the biasness against the effect of population growth on economic growth. Thus, based on scientific proof, a consensus has yet to be reached on the relationship between population growth and economic growth.

In addition, previous studies have explored the benefits of natural resources for economic growth. Natural resources, such as minerals, forests, wind, land, soils, fossil fuels and animals, make up a significant part of the wealth of a nation. A country or region rich in natural resources is believed to earn more revenue and more income (OECD 2011). For instance, the country could generate more revenue from natural resources such as timber, gas, minerals or oil as the price of that commodity rises. These

---

<sup>12</sup> Preventive checks refer to the act of restricting marriage to persons in hardship conditions, or delaying marriage due to financial instability, in order to reduce the birth rate. Meanwhile, positive checks involve situations that could increase the death rate, such as famine and war.

revenues enhance the capital and investment of the country, and hence promote growth in per capita output and improve human capital development through investments in education and job training. Besides this, sectors associated with natural resources offer employment opportunities and reduce poverty, especially for the rural poor. Among previous studies reporting a positive effect of natural resources on economic growth are Mideksa (2013), Brunnschweiler (2010), Chambers and Guo (2009) and Ding and Field (2005).

Despite this, previous empirical evidence also reports a negative effect of natural resources on growth (Kurecic & Kokotovic 2017; Ding & Field 2005; Gylfason, Herbertsson & Zoega 1999). The adverse impact of natural resources is attributed to the resource curse paradox. Several points can explain the mechanism of the curse. First, the higher income generated from natural resources creates an excess in demand for non-traded goods, which later affects traded goods that depend on the non-traded products as inputs of production. The phenomenon causes an upsurge in the relative prices of the country and appreciation in the currency, and hence hampers the exports of the country (Sachs & Warner 2001; Frankel 2012; Mideksa 2013). Next, natural resources can be associated with rent-seeking issues. Torvik (2002) complements the results of the previous findings of Lane and Tornell (1996) and Baland and Francois (2000) that shows a lower welfare or income due to natural resource abundance. Due to demand externalities, productive entrepreneurs are more interested in rent-seeking profits on natural resources. Overall, having more natural resources increases rent-seeking activities that lower average productivity in both the traded and non-traded sectors of the economy. Meanwhile, other researchers have found a positive relationship between natural resources and corruption (Kolstad & Søreide 2009; Sala-i-Martin & Subramanian 2003).

On the other hand, some previous studies have argued that ethnicity is a salient factor in determining economic outcomes (Easterly & Levine 1997; Alesina & Ferrara 2005; Gören 2014). According to Alesina (1994), ethnic diversity may increase segregation, hindering agreement on the provision of public goods such as infrastructure and education, and optimal policy. This may result in rent-seeking behaviour among the ethnic groups in power, at the cost of society. For instance, based on cross-country analysis, Easterly and Levine (1997) support the role of ethnic diversity in explaining variations in public policies and political stability across countries. Their results lend empirical support to theories that ethnic segregation leads to rent-seeking activities and

impedes consensus on public goods, thereby hampering long-run economic growth. In the case of Africa, Easterly and Levine (1997) reveal that high ethnic diversity has resulted in lower schooling, weaker financial systems, unstable exchange rates and inadequate infrastructure development, which have in turn inhibited economic growth. More recently, Gören (2014) summarises the impact of ethnic diversity on economic growth based on several transmission channels: investment, civil war, human capital, government consumption, political volatility, market deformations, trade openness and fertility.

Another issue that has been a concern of development economists is the role of institutions in explaining per capita differences in cross-country or regional growth (Acemoglu & Robinson 2008). Regardless of the disputes in the definition of an institution, Hodgson (2006) concludes that it is a system of predominant social rules that shape social behaviour or social interactions. This system includes law and governance, firms and organisations, communication, transactions, social etiquette and others. Looking at a different aspect of institutions, many researchers have found a positive association between institutional quality and economic performance (Yıldırım & Gökalp 2016; Nawaz, Iqbal & Khan 2014; Alexiou, Tsaliki & Osman 2014; Valeriani & Peluso 2011; Easterly, Levine & Roodma 2004; Knack and Keefer 1995). The researchers view favourable economic development because of promising economic policies determined by good institutions. According to Valeriani and Peluso (2011), though the size of the impact will differ among developed and developing countries, good institutional quality matters for the economic development of both categories.

The current institutional quality indicators that have been developed by rating agencies, international organisations and research groups those are prone to criticism. Each of the indicators has its merits and constraints, and selecting the best has been subject to ongoing debate. Several indicators, such as the Worldwide Governance Indicators (WGIs), Global Competitiveness Index (GCI), International Country Risk Guide (ICRG) rating, indicators from Business Environmental Risk Intelligence (BERI), the Global Integrity Index (GII), Corruption Perception Index (CPI) and Economic Freedom of the World Index, have been used widely as measures of institutional quality (Zhuang, de Dios & Lagman-Martin 2010). While these indicators work at the country level, efforts to construct equivalents for the regional or subnational level have been made by other researchers (Arbolino & Boffardi 2017; Wig & Tollefsen

2016; Baranov, Malkov, Polishchuk, Rochlitz & Syunyaev 2015). Despite there being no single set of guidelines for developing such an index, Fukuyama (2013) proposes four measures for monitoring the quality of institutions: (1) procedural measures, (2) capacity measures, (3) output measures and (4) bureaucratic autonomy measures. Besides, the institutional indicators based on cross-country variation are developed based on a number of indices that can be grouped into 7 categories: (1) constitutional structure, (2) potential of social issue, (3) administrative and legal system, (4) economic institutions, (5) system of education, (6) social organisation, and 7) future innovation (Eicher & Rohn 2007).

## 2.4 Methodology

### 2.4.1 Regression framework

This study uses three-stage least squares (3SLS) and bootstrap sampling and estimation techniques to examine the factors that explain the variations in growth of development across states in Malaysia. The 3SLS is used to take into account the presence of correlation between the error terms in the simultaneous equations. The study derives four simultaneous equations for  $\ln GSDP$ ,  $\ln Agr$ ,  $\ln Mfg$  and  $\ln Revenue$  as follows:

$$\begin{aligned} \ln GSDP_{it} = & \alpha + \beta \ln Agr_{it} + \ln Mfg_{it} + \beta_{Revenue} \ln Revenue_{it} + \\ & \beta_{Natural} \ln Natural_{it} + \beta_{HumanCap} HumanCap_{it} + \\ & \beta_{Pop} Pop_{it} + \beta_{Chinese} Chinese_{it} + \varepsilon_{it}, \end{aligned} \quad (1)$$

$$\begin{aligned} \ln Agr_{it} = & b + \beta_{Mfg} \ln Mfg_{it} + \beta_{Revenue} \ln Revenue_{it} + \\ & \beta_{HumCap} HumCap_{it} + \beta_{Pop} Pop_{it} + \beta_{Land} Land_{it} + \\ & \beta_{Rfall} Rfall_{it} + \varepsilon_{it}, \end{aligned} \quad (2)$$

$$\begin{aligned} \ln Mfg_{it} = & c + \beta_{Agr} \ln Agr_{it} + \beta_{Revenue} \ln Revenue_{it} + \\ & \beta_{HumCap} HumCap_{it} + \beta_{Pop} Pop_{it} + \beta_{Road} Road_{it} + \varepsilon_{it}, \end{aligned} \quad (3)$$

$$\begin{aligned} \ln Revenue_{it} = & d + \beta_{GSDP} \ln GSDP_{it} + \beta_{Natural} Natural_{it} + \\ & \delta_{BNstate} dummyBNstate_{it} + \varepsilon_{it} \end{aligned} \quad (4)$$

where  $\ln GSDP$ ,  $\ln Agr$ ,  $\ln Mfg$  and  $\ln Revenue$  refer to the log of the state gross domestic product, the log of the agriculture portion of the state gross domestic product, the log of the manufacturing portion of the state gross domestic product and the log of the total state revenue, respectively. The notation *Revenue* represents institutional factors of state governments. As relevant time series data on institutional quality indicators on Malaysian state governments are not indicated, the use of *Revenue* is competent to postulate the institutional fiscal capacity of state governments. This practice is consistent with the capacity measures of institutional quality as suggested by Fukuyama (2013). Moreover, Ajaz and Ahmed (2010) associate good governance with higher revenue collection, which enables the government to provide a better tax system and favourable macroeconomic policy. Eicher and Rohn (2007) report tax revenue variable is included among other variables to measure economic institutions of the institutional quality indices. Besides, developing an institutional quality index across Malaysian states is beyond the scope of this study. *Natural*, *HumCap*, *Chinese* and *Pop* refer to natural resources, human capital, the Chinese community and the total population, respectively. Meanwhile, *Rfall* signifies the amount of rainfall and *Land* the total land area given over to agriculture. Last but not least, *Road* denotes the total length of the road infrastructure, while *dummyBNstate* signifies the political ruling party of the Malaysian states. The Barisan Nasional (BN) is a political coalition in Malaysia that represents the ruling government. In this regard, states are ruled by BN are expected to receive higher budget allocation, thus have better revenue compared to the states ruled by the opposition party. The subscript *it* refers to a cross-section of states in a particular year. State governments could cultivate economic activities through public service provisions and job opportunities. Generally, a state that has higher state revenue enjoys better facilities as well as higher economic and sectoral growth. All the dependent variables,  $\ln GSDP$ ,  $\ln Agr$ ,  $\ln Mfg$  and  $\ln Revenue$ , are considered endogenous to the system.

As a few dependent variables also appear on the right-hand side of the other equations, it is assumed that there is a correlation between the error terms. In this matter, 3SLS combines the instrumental approach, where exogenous variables are used as instrumental variables, with the generalised least squares technique to obtain consistent parameter estimates and counteract the cross-equation correlation of the disturbance terms (Zellner & Theil 1962). The instrumental variables contained in the above system of equations are *Rfall*, *Land*, *Road*, *dummyBNstate*, *Bumi* and *Landlocked*, where *Bumi* is the proportion of Bumiputera within the state's population

and *Landlocked* is a dummy variable indicating a landlocked state. All the instrumental variables are entirely exogenous to the dependent variables  $\ln GSDP$ ,  $\ln Agr$ ,  $\ln Mfg$  and  $\ln Revenue$ , and none of the instrumental variables is included in the main equation for  $\ln GSDP$ . Based on the identification rule, there is no under-identification problem in the system. Further discussion of the identification process is given in Appendix 1.1. The study uses bootstrapped standard errors with sampling of 1000 replication to approximate robust standard errors. It is employed to regulate the heteroskedasticity issue in the 3SLS regression (Ando & Hodoshima 2007). The 3SLS estimation was carried out using Stata software, 13<sup>th</sup> version.

#### 2.4.2 Data and variables

The study involves state governments, namely Johor, Melaka, Negeri Sembilan, Pulau Pinang, Perak, Perlis, Selangor, Kedah, Kelantan, Pahang, Terengganu, Sabah and Sarawak. Subject to data availability, the study covers the period between 2005 and 2015<sup>13</sup>. The data used as proxy variables in the four simultaneous equations are total state gross domestic product (*GSDP*), total state agricultural and manufacturing products (*Agr* and *Mfg*), share of employees with both secondary and tertiary levels of education (*HumCap*), state-level population (*Pop*), total state revenue (*Revenue*), areas of plantation of paddy and industrial crops (*Land*), total forest area (hectares) (*Natural*), rainfall amount (mm) (*Rfall*) and length of roads (km) (*Road*).

To measure political indicator of *dummyBNstate*, this study employed dummy variable, whereby 1 represents the state that has been ruled by Barisan Nasional (BN) while 0 represents the state that was under the control of the opposition coalition. Meanwhile, the study uses the proportion of the population of the Chinese community (*Chinese*) to represent ethnicity and analyse its impact on economic growth. The Chinese ethnics have earned the highest income among the ethnic groups in Malaysia since the British colonial era (1786-1957)<sup>14</sup>. In this regard, the Chinese have a

---

<sup>13</sup> Data on GDP by activity at state level, either for agriculture (*Agr*) or manufacturing (*Mfg*), are publicly available only from the year 2005 onwards, based on a comprehensive methodology, in the System of National Accounts (SNA).

<sup>14</sup> Resulting from the labour policy of the British colonial era, 'Divide and Rule', Malaysian economic activities were segregated based on ethnic groups. The ethnic majority of Malay was engaged in traditional or agricultural activities, while the ethnic Chinese were allowed to occupy themselves with mining and business opportunities. Meanwhile, the majority of Indians were employed on the rubber estates and as railway labourers.



significant role in explaining the variation in economic performance within the states in Malaysia. Table 2.6 summarizes the measurement of the variables used in this study.

**Table 2.6: Variables and their measurement**

Notation	Variable	Measurement	Endogenous /Exogenous
lnGSDP	state gross domestic product	log GSDP	Endogenous
lnAgr	state agriculture product	log agriculture GSDP	Endogenous
lnMfg	state manufacturing product	log manufacturing GSDP	Endogenous
lnRevenue	total state revenue	log total state revenue	Exogenous
Natural	natural resource in the form of total forest area	log forest area (hectares)	Exogenous
Pop	Population	log total population	Exogenous
Rfall	amount of rainfall	log rainfall amount (mm)	Exogenous
Land	area of land given to agriculture	log planted area (paddy+industrial crops) in hectares	Exogenous
HumCap	human capital	share of employees with secondary + tertiary level of education	Exogenous
Road	road infrastructure	log of length of roads (km)	Exogenous
Chinese	Chinese community	proportion of Chinese in the total state population	Exogenous
dummyBNstate	political indicator	dummy 1= state ruled by the BN dummy 0= state ruled by the opposition	Exogenous

### 2.4.3 Sources of data

The data used in this study are collected from various sources involving thirteen states in Malaysia (Johor, Melaka, Negeri Sembilan, Pulau Pinang, Perak, Perlis, Selangor, Kedah, Kelantan, Pahang, Terengganu, Sabah and Sarawak) from 2005 to 2015. The study collected data on state gross domestic product (*GSDP*), state gross domestic product contributed by agriculture and manufacturing (*Agr and Mfg*), proportion of ethnic Bumiputera (*Bumi*) and Chinese (*Chinese*) and the state-level population (*Pop*)

from the Economic Planning Unit, Prime Minister's Department website. Data on state gross domestic product (*GSDP*) by type of economic activity are only available from the year 2005 onwards. *GSDP* in Malaysia is divided into five components, namely agriculture, services, manufacturing, mining and quarrying, and construction. This study employs the state gross domestic product from agriculture and manufacturing (*Agr and Mfg*) but excludes the other three sectors from the three-stage least squares (3SLS) equations.

In the Malaysian context, the agriculture sector includes crops, livestock, forestry and logging as well as fishery sub-sectors. On the other hand, manufacturing products contain any transformation of physical or chemical materials or components into new products. The top seven sub-sectors that have contributed to changes in the value of gross domestic product of manufacturing are food, beverage and tobacco; textile, wearing apparel, leather and footwear; wood, furniture and paper products; petroleum, chemical, rubber and plastic; electrical and electronic products; transport and equipment; and non-metallic mineral, basic metal, and fabricated metal products (Department of Statistics Malaysia). Although the service sector is known to be an important factor in the economy, the inconsistency in the data on informal services, the sector is excluded from the analysis. The data on *GSDP*, *Agr and Mfg* are at constant 2010 prices.

The study compiles data on plantation areas for both paddy and industrial crops from the Agrofood Statistics reports of 2010, 2011, 2012, 2013, 2014 and 2015 that were publicly available on the Ministry of Agriculture and Agro-Based Industry website. The summation of the total plantation areas for paddy and industrial crops is used as a proxy variable for *Land*. The data on total state revenue (*Revenue*) are compiled from the yearly financial statements of state government reports from the year 2005 to 2015. The reports can be retrieved from the National Audit Department website. Revenue is used as a proxy variable for institutional quality at the subnational level.

For human capital (*HumCap*), the study uses share of employees with both secondary and tertiary levels of education as a proxy variable. However, data on educational level of employees by state is not publicly available between 2005 and 2010. Similarly, data used to proxy for *Natural* on total forest area (hectares) across the Malaysian states are also not publicly accessible. Therefore, the study requested data on employees' educational level and total forest area by state from the Department of Statistics Malaysia (DOSM) through its online portal. Meanwhile, the data on rainfall

(millimeter) and length of roads (km) by states were supplied by the Malaysian Meteorological Department and Public Works Department Malaysia respectively, and used to represent rainfall (*Rfall*) and infrastructure (*Infra*), correspondingly. Lastly, the study indicates the states ruled by the ruling party, BN, based on the compiled data on the state legislative assembly seats that can be retrieved from the Election Commission of Malaysia. States with majority seats won by BN are considered as the state under BN's ruling while state which has less than majority seats won by BN are grouped under the control of the opposition party.

## 2.5 Findings and discussion

The results of the 3SLS with bootstrap sampling and estimation are reported in Table 2.7. First, the goodness of fit measured by R-squared of 0.9564 in the main equation suggests that explanatory variables included in the equation  $\ln GSDP$  are sufficient to explain the changes in gross state domestic product across Malaysian states. It shows that all independent variables in the  $\ln GSDP_{it}$  equation are significant in affecting the growth in the gross state domestic product (GSDP). It is found that both the agriculture and manufacturing sectors are independently important in the growth process of Malaysian states. The agriculture sector provides smaller contribution than the manufacturing sector to the overall Malaysian GDP. However, the results of this study reveal that each percentage point of growth in the agriculture sector leads to an increase in the growth of the GSDP by 0.1691 percentage points, which is higher than the effect of an additional percentage point of manufacturing growth of 0.1531 percentage points.

In addition, the estimation results from the equation  $\ln Mfg_{it}$  indicate interdependency between the manufacturing and agriculture sectors across the Malaysian states. The positive effect of agriculture on manufacturing reveals that the latter depends on the former as a supplier of raw materials and inputs for industrial output. In the case study of Malaysia, Mahadevan (2007) also reports that the agricultural sector's growth may induce higher manufacturing growth, especially through the enhancement of agro-based industries such as rubber, timber and palm oil processing. Conversely, the insignificant negative coefficient of the manufacturing industry in the  $\ln Agr_{it}$  equation implies that states with a comparative advantage in manufacturing do not affect the growth of the agriculture sector.

**Table 2.7: 3SLS estimation result: factors that explain the variation of the economic growth across states (13 states from 2005 to 2015)**

Equation	Coefficient	Bootstrap Standard error	P-value
<b>lnGSDP</b>			
lnAgr	0.1691***	0.0572	0.003
lnMfg	0.1531***	0.0398	0.000
lnRevenue	0.4039***	0.0467	0.000
Human capital	0.0139***	0.0041	0.001
Chinese proportion	0.0107***	0.0015	0.000
Natural resource	-0.0781***	0.0157	0.000
Population	0.4479***	0.0275	0.000
R-squared = 0.9564 Probability = 0.0000			
<b>lnAgr</b>			
lnMfg	-0.1324	0.0887	0.135
lnRevenue	0.4413***	0.1123	0.000
Population	0.4007***	0.1098	0.000
Land size	-0.1250***	0.0334	0.000
Human capital	-0.0373***	0.0087	0.000
Rainfall	0.0494	0.1969	0.802
R-squared = 0.6101 Probability = 0.0000			
<b>lnMfg</b>			
lnAgr	1.1294**	0.5209	0.030
lnRevenue	1.1178***	0.1806	0.000
Population	0.4531**	0.1987	0.023
Human capital	0.1418***	0.0258	0.000
Road	-1.0689***	0.4279	0.013
R-squared = 0.5334 Probability = 0.0000			
<b>lnRevenue</b>			
lnGSDP	0.7045***	0.0342	0.000
Natural resource	0.2345***	0.0146	0.000
dummyBNstate	0.3775***	0.0634	0.000
R-squared = 0.7378 Probability = 0.0000			

Note: \*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% levels respectively.

The growth performance of the Malaysian economy during the 2000s is slower than in the 1990s. The manufacturing and service sectors were given higher attention while less focus was given to the role of agriculture in the economy; thus, the cause of the slower economic growth during the 2000s. According to the Minister of Agriculture and Agro-industry, Datuk Seri Ahmad Shabery Cheek, people's perceptions of agriculture as a non-profitable industry carried out by poor villagers. As reported by Bernama (2017), Datuk Seri Ahmad Shabery Cheek claims:

“Agrofood is an important sector in realizing the government's efforts in steering Malaysia to become a high-income, developed nation. Besides ensuring food security, this sector also provides the spaces and opportunities which can be explored in creating new sources of wealth that will not only benefit the socio-economic players but also contribute to the country's economic growth”<sup>15</sup>.

This statement implies that the agriculture sector could be a key area in helping the country to achieve developed nation status. It should be viewed as an important economic source that could enhance the standards of living. Meanwhile, too much reliance on manufacturing has reduced the growth of the agriculture sector of the country (Bernama 2017).

As expected, human capital has a positive effect on the growth of GSDP and the manufacturing sector. In this study, human capital is measured by the share of workers with secondary and tertiary level of education, from the total number of workers. The results show that states with higher human capital appear to have higher economic growth, which implies that variation in the growth across states is related to the educational level of the workers. This result lends empirical evidence to similar findings in previous studies by Bundell, Lorraine, Meghir and Sianesi (1999) and Murthy and Chien (1997). The 3SLS estimation reveals that human capital provides a higher contribution to manufacturing growth than GSDP growth. Each percentage point increase in the educational level of workers increases the growth in GSDP and manufacturing by 0.0139 and 0.1418 percentage points, respectively. In contrast, this study finds that states with higher educational level among their workers exhibit lower growth in the agricultural sector. The growth in agriculture declined by 0.0373 percentage points as a one-percentage point higher share of workers attains higher education. The findings of this study suggest that workers with higher education are more likely to leave agricultural industries and have better opportunities to be employed in high-skilled jobs. Where education could be a determinant for switching occupational sectors, the agricultural sector is mainly associated with self-employed, family workers and those with low level of education (Tocco, Bailey & Davidova 2013).

---

<sup>15</sup> Refer to Bernama (2017), <http://www.thesundaily.my/news/2017/11/06/need-erase-stigma-towards-vocation-agriculture-ahmad-shabery>

In addition, the 3SLS estimation results imply that states with higher population growth perform better in terms of GSDP, in both agriculture and manufacturing. This progression implies that population growth could improve the division of labour, hence increase output per worker. Thus, the increase of each percentage point in population growth leads to the increase in the growth of GSDP, agriculture and manufacturing by 0.4479, 0.4007 and 0.4531, respectively.

Another variable found to be important in explaining variations in growth across Malaysian states is also related to institutional factors. The variable is the total state revenue. This study shows that states with higher total revenue have higher growth in GSDP, as well as in agriculture and manufacturing outputs. These results support the argument that states with higher revenue will have more capacity and could increase their development expenditure, consequently, improve the economic performance of the state. Further discussion on how state revenue affects development can be found in the next chapter. The increase of in total state revenue on the growth in GSDP, agriculture and manufacturing are 0.4039, 0.4413 and 1.1178 percentage points, respectively. The results imply that the growth of the state revenue is more apparent in the manufacturing than the agriculture sector within Malaysian states.

Another variable that has an important effect on the GSDP is natural resources, represented by total forest area. Based on Table 2.7, this study shows that states with larger forest areas tend to have slower growth in overall GSDP. This finding lends empirical support to the resource curse theory of natural resources. Similarly, previous findings by Doraisami (2015) and Badeeb, Lean and Smyth (2016) report empirical evidence of the resource curse paradox in the Malaysian case. Both studies analysed the oil aspect of natural resources. According to Doraisami (2015), access to an abundance of natural resource has driven the government to involve itself in inefficient activities, provide unproductive state-sponsored investment funding, finance ambitious affirmative action programs and purchase many parts of electorate to accomplish its own goals. In addition, Agrawal, Cashore, Hardin, Sheperd, Bensen and Miller (2013), of the United Nations Forum argue that several factors have challenged the value added of the forest sector in the developing countries. These factors include technological changes, illegal and uncontrolled harvesting activities, political violence and social dissatisfaction.

The results also reveal the significance of ethnicity to the variation in economic growth across Malaysian states. This study includes the proportion of Chinese in each state, to represent the ethnic impact on the growth of GSDP. The Chinese are known to

have the highest per capita income among the ethnic groups in Malaysia, and play a major role in the economic performance of individual states. Based on Table 2.7, this study also finds that states with higher Chinese populations have higher growth in per capita GSDP. This result supports the evidence that most of the Chinese population are actively involved in business and professional jobs, which allows them to contribute directly to the GSDP growth. On the other hand, the low performance in the states with majority Bumiputera populations, i.e., Kedah and Perlis, is likely to be because they are more reliant on agriculture production. Based on a report by Zamhari (2016), a former Malaysian Chinese Association (MCA) president Tan Koon Swan claims that the Chinese contribute 70 percent of Malaysian GDP. The larger population Chinese in the developed states can explain the improved economic performance of the developed states of Pulau Pinang, Selangor, Johor, Perak, Malacca and Negeri over the less developed states of Kedah, Kelantan, Terengganu, Pahang, Perlis, Negeri Sembilan, Sabah and Sarawak<sup>16</sup>.

As for equation  $\ln Agr_{it}$ , the result supports the ‘stylised fact’ of an inverse relationship between land area and output growth of agriculture. The idea is that an increase in land area would lower farm productivity, hence lowering growth of output (Ladvenicová & Miklovičová 2015). This study uses total plantation area of paddy and industrial crops as a measure of land area, as these crops have made a successful contribution to the agriculture sector along with palm oil. This result is supplementary to the findings of Abu Hassan Asari, Abd Rahman, Abdul Razak, Shabir Ahmad, Harun and Jusoff (2011), who found a negative effect of plantation area on production output in the case of Malaysian palm oil. The finding is consistent with previous findings by Thapa (2007) and Berry and Cline (1979). Quantitatively, a one-point increase in land area would reduce the growth of agriculture output by 0.125 points. On the other hand, the amount of rainfall has an insignificant effect on the growth of agriculture.

The estimation results also reveal a significant negative impact of infrastructure on manufacturing growth. As the study uses length of roads (km) to measure infrastructure at the state level, the positive effect of infrastructure on the growth of manufacturing may not be fully understood. For instance, the positive effect of infrastructure might be achieved through different modes of transport and facilities,

---

<sup>16</sup> Based on the data on ethnicity of the population from 2005 to 2015, the Chinese share of total state population in all the developed states was above 20 percent. However, the proportion of Chinese was less than 17 percent in all of the less developed states except Sarawak (Population Quick Info, Department of Statistics Malaysia).

such as rail and water transport. Furthermore, high dependence on road transport would incur a higher cost of trading that might reduce the growth of manufacturing. Based on the raw data, this study finds that states that have contributed more than 10 percent of total manufacturing GDP have access to port facilities. These states are Johor, Pulau Pinang, Selangor and Sarawak<sup>17</sup>. However, due to limited data on other variables at the state level, this study considers the length of roads (km) as the best selection of proxy variable for the level of infrastructure within Malaysian states.

Meanwhile, this study finds that total state revenue is positively affected by growth in GSDP and natural resources. GSDP is a major determinant of total state revenue, a one-percentage point increase in GSDP, increases state revenue by 0.7045 points. States with higher GSDP have higher income and better sources of revenue than those with lower GSDP. Measured by total forest area, a percentage point increase in natural resources increases total state revenue by 0.2345 points. Lastly, the 3SLS estimation results show the significant effect of political institutions on total state revenue. This study finds that a state that has been ruled by BN coalition is likely to earn more revenue over the state that is ruled by the opposition coalition. Quantitatively, on the average, the state under BN ruling earned higher revenue of 0.3275 percentage points compared to the state under the opposition ruling.

Next, the study presents the post estimation tests of 3SLS regression in the Table 2.8. The study uses Hausman's test to compare between the consistencies of Ordinary Least Square's (OLS) estimation with that of 3SLS's estimation. The P-value indicates null hypothesis of consistent OLS estimators is rejected. The rejection of null hypothesis might be a result of endogeneity problem between variables in the system of equations. In addition, this result suggests that 3SLS is deemed reliable over OLS estimation. Moreover, as 3SLS provide efficient estimates than 2SLS under general condition, the use of 3SLS provides relative advantage (Belsley 2008). In addition, the study tests the significance of all the coefficients of independent variables in each equation using Wald's test. As shown in Table 2.8, the p-values imply that all the coefficients of independent variables in each equation are jointly significant to explain the dependent variable. The Wald' tests results indicate that all the explanatory variables included in the equations are linearly fit to the models.

---

<sup>17</sup> Other states with access to port facilities are Pahang and Terengganu, while the remaining states of Kedah, Kelantan, Malacca, Negeri Sembilan, Perlis, Perak and Sabah do not have such access.



**Table 2.8: Post estimation tests**

<b>Test</b>	<b>Chi-square and P-value</b>
<b>1) Hausman's test</b>	
Null hypothesis: OLS estimator is consistent and efficient over 3SLS estimator	Chi square: 109.67 P-value: 0000
<b>2) Wald's test</b>	
<b>a) Equation <math>\ln GSDP</math></b> Null hypothesis: all the coefficients except intercept in the equation are jointly significant	Chi square: 18445.86 P-value: 0000
<b>b) Equation <math>\ln Agr</math></b> Null hypothesis: all the coefficients except intercept in the equation are jointly significant	Chi square: 2613.69 P-value: 0000
<b>c) Equation <math>\ln Mfg</math></b> Null hypothesis: all the coefficients except intercept in the equation are jointly significant	Chi square: 949.42 P-value: 0000
<b>d) Equation <math>\ln Revenue</math></b> Null hypothesis: all the coefficients except intercept in the equation are jointly significant	Chi square: 2437.43 P-value: 0000

## 2.6 Conclusion and policy recommendations

In this study, a descriptive analysis of recent patterns of disparity in development performance across Malaysian states using the CDI and some broad, basic indicators of socio-economic development was provided. Though some development indicators have demonstrated a decline in the disparity in spatial development outcomes, it is worth noting that the performance of less developed states has lagged compared to the developed states for many years. Spatial balance in economic growth across regions or states has become a concern for policymakers to maintain sustainable economic development. The main objective of this study was to examine the factors that are important in explaining the variations in overall economic growth across states in Malaysia. The study uses 3SLS estimation with four equations capturing overall growth ( $\ln GSDP_{it}$ ), agriculture ( $\ln Agr_{it}$ ), manufacturing ( $\ln Mfg_{it}$ ) and state revenue ( $\ln Revenue_{it}$ ). The results illustrate the importance of both the agriculture and manufacturing sectors in accelerating per capita growth of GDP. The quantitative evidence implies that there should be a greater focus on the agriculture sector so that the benefits of such growth may be utilised. For instance, the government might increase investment in agriculture to empower the growth and productivity of the sector. Recently, the then Prime Minister of Malaysia, Dato' Seri Najib Abdul Razak,

announced in the 2018 budget speech that the government would allocate RM 6.5 billion to the agriculture sector. This amount is the largest allocation to that sector in the Malaysian history (Hassan 2017). This effort should be continued for the next few years, since the positive impact of agriculture might not be observable over a short period. On the other hand, the study finds that states growth in manufacturing have insignificant impact on the growth in agriculture. However, growth in agriculture would positively affect growth in manufacturing. These findings support the importance of different economic sectors as the key to the growth of state performance.

This study also finds that variations in the growth of GSDP and manufacturing across states are positively related to the educational level of employees. Employers should thus encourage employees to attain a high level of education and provide training and services to improve their skills and knowledge. Other variables that positively explain the variations in states' per capita growth are the Chinese community, total state population and state revenue. Total state revenue comprises state-sourced revenue and transfers from the federal government. In this context, state governments play a role in distributing and collecting their own revenue, while the federal government could reduce the spatial imbalance in economic development across states through a fair distribution of federal transfers. Conversely, there is an adverse growth effect of forests on GSDP and of land area on agriculture. The negative effect of forests on GSDP is interesting to explore. Further research needs to be undertaken to recognize the importance of forests towards the growth and the significance of forests to the economy. By determining these key determinants of growth, potential areas that could generate or maintain economic growth within Malaysian states would be better understood. Recognising the position of state governments as one of the key reasons for the spatial imbalance in GSDP across states, this study attempts to examine further on the role of institutional factor in the imbalance of socio-economic development by state, in the next chapter.

## References

Abu Hassan Asari, FF, Abd Rahman, NH, Abdul Razak, EA, Shabir Ahmad, BA, Harun, NFA & Jusoff, K 2011, 'A time series analysis of the relationship between total area planted, palm oil price and production of Malaysian palm oil', *World Applied Sciences Journal*, vol. 12, pp. 34-40.

Acemoglu, D & Robinson, J 2008, 'The role of institutions in growth and development', World Bank, Washington DC.

Afzal, M 2009, 'Population growth and economic development in Pakistan', *The Open Demography Journal*, vol.2, no.1.

Agrawal, A, Cashore, B, Hardin, R, Shepherd, G, Benson, C & Miller, D 2013, 'Economic contributions of forests', Background Paper 1, United Nations Forest on Forests (UNFF). *10th Session, Istanbul, Turkey*.

Ahmad, RN & Ahmad, K 2016, 'Impact of population on economic growth: a case study of Pakistan', *Bulletin of Business and Economics*, vol. 5, no.3, pp. 162-176.

Aidi, HO, Emecheta, CN, & Ikenna, M 2016, 'Population Dynamics and Economic Growth in Nigeria. *Population*, vol. 7, no. 15.

Ajaz, T & Ahmad, E 2010, 'The effect of corruption and governance on tax revenues', *The Pakistan Development Review*, pp. 405-417.

Akpan, SB, Udoka, SJ & Okon, UE 2014, 'Examination of empirical relationships between industrial activities and agricultural Policy Outputs in Nigeria (1970-2012)', *International Journal of Food and Agricultural Economics*, vol. 2, no.1, pp. 13-22.

Alesina, A 1994, 'Political Models of Macroeconomic Policy and Fiscal Reforms', in *Voting for Reform: Democracy Political Liberalization and Economic Adjustment*. Eds. Stephen Haggard and Stephen Webb. New York: New York University Press.

Alesina, A & Ferrara, EL 2005, 'Ethnic diversity and economic performance', *Journal of Economic Literature*, vol. 43, no. 3, pp. 762-800.

Alexiou, C, Tsaliki, P & Osman, HR 2014 'Institutional quality and economic growth: Empirical evidence from the Sudanese economy', *Economic Annals*, vol. 9, no. 203, pp. 119-137.

Ali S, Ali A, Amin A 2013, 'Impact of population growth on economic development of Pakistan', *Middle-East Journal of Scientific Research*, vol.18, no.4, pp. 483-491.

Ando & Hodoshima 2007, 'A note on bootstrapped White's test for heteroskedasticity in regression models', *Economic Letters*, vol. 97, no. 1, pp. 46-51.

Arabi, KAM & Abdalla, SZS 2013, 'The impact of human capital on economic growth: Empirical evidence from Sudan', *Research in World Economy*, vol. 4, no.2, pp. 43-53.

Arbolino, R & Boffardi, R 2017, 'The impact of institutional quality and efficient cohesion investments on economic growth evidence from Italian regions', *Sustainability*, vol. 9, no. 8, 1432.

Athukorala, P-C & Narayanan, S 2018, 'Economic corridors and regional development: The Malaysian experience', *World Development*, vol. 106, pp. 1-14.

Badeeb, RA, Lean, HH & Smyth, R 2016, 'Oil curse and finance–growth nexus in Malaysia: The role of investment', *Energy Economics*, vol. 57, pp. 154-165.

Baland, JM & Francois, P 2000, 'Rent-seeking and resource booms', *Journal of Development Economics*, vol. 61, no. 2, pp. 527-542.

Baranov, A, Malkov, E, Polishchuk, L, Rochlitz, M & Syunyaev, G 2015, 'How (not) to measure Russian regional institutions', *Russian Journal of Economics*, vol. 1, no. 2, pp. 154-181.

Barlow, R 1994, 'Population growth and economic growth: Some more correlations', *Population and Development Review*, vol. 20, no.1, pp.153-165.

Barro, RJ & Sala-i-Martin, X, 1995, *Economic growth*. McGraw-Hill, New York.

Barro, RJ 1996, 'Determinants of economic growth: a cross-country empirical study', no. w5698. National Bureau of Economic Research.

Bassanini, A & Scarpetta, S 2001, 'Does human capital matter for growth in OECD countries? Evidence from Pooled Mean-Group estimates', OECD Economics Working Paper No. 282.

Becker, GS 1962, 'Investment in human capital: A theoretical analysis', *Journal of Political Economy*, vol. 70, no.5 (Part 2), pp 9-49.

Becker, GS, Murphy, KM & Tamura, R 1990, 'Human capital, fertility, and economic growth', *Journal of Political Economy*, vol. 98, no.5 (Part 2), pp. 12-37.

Belsley, DA 1988, 'Two-or three-stage least squares?', *Computer Science in Economics and Management*, vol. 1, no. 1, pp. 21-30.

Benhabib J & Spiegel MM 1994, 'The role of human capital in economic development. Evidence from aggregate cross-country time', *Journal of Monetary Economics*, vol. 34, no. 2, pp.143-173.

Bernama 2017, 'Need to erase stigma towards vocation in agriculture: Ahmad Shabery in The Sun Daily,  
<<http://www.thesundaily.my/news/2017/11/06/need-erase-stigma-towards-vocation-agriculture-ahmad-shabery>>

Berry, R. A., & Cline, W. R. (1979). *Agrarian structure and productivity in developing countries: a study prepared for the International Labour Office within the framework of the World Employment Programme*. Johns Hopkins Univ. Press.

Bloom DE & Freeman RB 1986, 'Economic development and the timing and components of population growth', *Journal of Policy Modelling*. Vol. 10, pp. 57-81.

Brunschweiler CN 2009, 'Oil and growth in transition countries', Working Paper 09/108, Center of Economic Research at Swiss Federal Institute of Technology, Zurich.

Bundell R, Lorraine, D, Meghir C & Sianesi, B 1999, 'Human capital investment: the returns from education and training to the individual, the firm and the economy', *Fiscal Studies*, vol. 20, no. 1, pp. 1-23.

Cantore, N, Clara, M, Lavopa, A & Soare, C 2017, 'Manufacturing as an engine of growth: Which is the best fuel?', *Structural Change and Economic Dynamics*, vol. 42, September, pp. 56-66.

Chambers, D & Guo, JT 2009, 'Natural Resources and Economic Growth: Some Theory and Evidence', *Annals of Economics & Finance*, vol.10, no.2.

Chenery, HB, Syrquin, M & Elkington, H 1975, *Patterns of development, 1950-1970* (Vol. 75). London: Oxford University Press.

Chow, GC 1993, 'Capital formation and economic growth in China', *The Quarterly Journal of Economics*, vol.108, no.3, pp. 809-842.

Coale AJ & Hoover E 1958, *Population growth and economic development in low income countries*. Princeton, New Jersey, Princeton University Press.

Cuaresma, JC & Lutz, W 2007, '*Human Capital, Age Structure and Economic Growth: Evidence from a New Dataset*', IIASA Interim Report. IIASA, Laxenburg, Austria: IR-07-011

Dao, MQ 2012, 'Population and economic growth in developing countries', *International Journal of Academic Research in Business and Social Sciences*, vol. 2, no.1, pp. 6-17.

Ding, N & Field, BC 2005, 'Natural resource abundance and economic growths', *Land Economics*, vol. 81, no.4, pp. 496-502.

Doménech, R 2006, 'Human capital in growth regressions: how much difference does data quality make?', *Journal of the European Economic Association*, vol.4, no.1, pp. 1-36.

Doraisami, A 2015, 'Has Malaysia really escaped the resource curse? A closer look at the political economy of oil revenue management and expenditures' *Resources Policy*, vol. 45, pp. 98-108.

Department of Statistics Malaysia Official Portal.

Easterly, W, Levine, R & Roodma, D 2004, 'Aid, Policies, and Growth: Comment', *American Economic Review*, vol. 94, no. 3, pp. 774–780.

Easterly, W & Levine, R 1997, 'Africa's growth tragedy: policies and ethnic divisions', *The Quarterly Journal of Economics*, vol. 112, no. 4, pp. 1203-1250.

Easterlin, RA 1967, 'Effects of population growth on the economic development of developing countries', *The Annals of the American Academy of Political and Social Science*, vol.369, no.1, pp. 98-108.

Economic Planning Unit of Prime Ministers,

<<http://www.epu.gov.my/ms/statistik-ekonomi/akaun-negara>>

Economic Planning Unit 2001, *The third outline perspective plan (2001-2010)*, Prime Minister's Department Malaysia.

Economic Planning Unit 2006, *The Ninth Malaysian Plan Report, 2006-2010*, Prime Minister's Department Malaysia, viewed 12 September 2016,

< <http://www.epu.gov.my/en/rmk/ninth-malaysia-plan-2006-2010>>

Economic Planning Unit 2015, *The Eleventh Malaysian Plan Report, 2016-2020*, Prime Minister's Department Malaysia, viewed 12 September 2016,

<<http://www.epu.gov.my/en/rmk/eleventh-malaysia-plan-2016-2020>>

Economic Planning Unit 2013, *Malaysian Well-Being Report 2013*, Prime Minister's Department Malaysia, viewed 12 January 2016,

< <http://www.epu.gov.my/en/content/malaysian-well-being-report-2013>>

Eicher, T & Röhn, O 2007, 'Institutional determinants of economic performance in OECD countries—an institutions climate index', *CESifo DICE Report*, vol. 5, no. 1, pp. 38-49.

Frankel, JA 2012, 'The Natural Resource Curse: A Survey of Diagnoses and Some Prescriptions', HKS Faculty Research Working Paper Series RWP12-014, John F. Kennedy School of Government, Harvard University.

Fleisher, B, Li, H, & Zhao, MQ 2010, 'Human capital, economic growth, and regional inequality in China', *Journal of development economics*, vol. 92, no.2, pp. 215-231.

Fukuyama, F 2013, 'What is governance?', *Governance*, vol. 26, no.3, pp. 347-368.

Gemmell, N, Lloyd, TA & Mathew, M 2000, 'Agricultural growth and inter-sectoral linkages in a developing economy', *Journal of Agricultural Economics*, vol.51, no.3, pp. 353-370.

Gören, E 2014, 'How ethnic diversity affects economic growth. *World Development*, vol. 59, pp. 275-297.

Gylfason, T, Herbertsson, TT & Zoega G 1999, 'A Mixed Blessing: Natural Resources and Economic Growth,' *Macroeconomic Dynamics*, vol.3, June, pp. 204-225.

Hanushek, EA 2013, 'Economic growth in developing countries: The role of human capital', *Economics of Education Review*, vol. 37, pp. 204-212.

Henneberry, SR, Khan, ME & Piewthongngam, K 2000, 'An analysis of industrial - agricultural interactions: a case study in Pakistan', *Agricultural Economics*, vol. 22, no. 1, pp. 17-27.

Hassan, MS 2017, '2018 Budget: "Biggest allocation for agricultural sector to date"', *New Straits Time*, viewed 10<sup>th</sup> December 2017  
<<https://www.nst.com.my/news/nation/2017/10/295945/2018-budget-biggest-allocation-agricultural-sector-date>>

Hodgson, G 2006, 'What are institutions?', *Journal of Economic Issues*, vol. 40, no. 1, pp. 1-26.

Hussin, F & Ching, CW 2013, 'The contribution of economic sectors to economic growth: The cases of Malaysia and China', *International Journal of Academic Research in Economics and Management Sciences*, vol. 2, no. 2, pp. 36-48.

Hutchinson, F 2015, '(De)centralization and the Missing Middle in Indonesia and Malaysia', *Economics Working Paper*, ISEAS Yusof Ishak Institute, no. 2015-2.

Hwa, EC 1988, 'The contribution of agriculture to economic growth: some empirical evidence', *World Development*, vol. 16, no.11, pp. 1329-1339.

Izuchukwu, O 2011, 'Analysis of the contribution of agricultural sector on the Nigerian economic development', *World Review of Business Research*, vol.1, no.1, pp. 191-200.

Jenkins, H 1995, 'Education and production in the United Kingdom', *Economics Papers from Economics Group*, *Nuffield College*, University of Oxford.

Kanbur, R & Venables, AJ 2005, *Spatial inequality and development*. OUP Oxford.

Katircioglu, ST 2006, 'Causality between agriculture and economic growth in a small nation under political isolation: A case from North Cyprus', *International Journal of Social Economics*, vol.33, no.4, pp. 331-343.

Kim, S 2008, 'Spatial inequality and economic development: theories, facts and policies', World Bank Working Paper, No. 16.

Knack, S & Keefer, P 1995, 'Institutions and economic performance: cross-country tests using alternative institutional measures', *Economics & Politics*, vol. 7, no. 3, pp. 207-227.

Kothare, R 1999, 'Does India's population growth has a positive effect on economic growth?', *Social Science*, vol. 410, pp. 2-14.

Kolstad, I & Søreide, T 2009, 'Corruption in natural resource management: Implications for policy makers', *Resources Policy*, vol. 34, no. 4, pp. 214-226.

Kremer, M 1993, 'Population growth and technological change: one million B.C. to 1990', *Quarterly Journal of Economics*, vol.108, no.3, pp 681-716.

Kurecic, P & Kokotovic, F 2017, 'Examining the "Natural Resource Curse" and the Impact of Various Forms of Capital in Small Tourism and Natural Resource-Dependent Economies', *Economies*, vo. 5, no.1.

Kuznets, S 1960, Population change and aggregate output. In *Demographic and economic change in developed countries*, pp. 324-351, Columbia University Press.

Kuznets, S 1966, *Modern economic growth*. New Haven and London, 65.

Kyriacou, GA 1991, 'Level and growth effects of human capital: a cross-country study of the convergence hypothesis', Working paper 91-26, C.V. Starr Center, New York, NY

Ladvenicová, J & Miklovičová, S 2015, 'The relationship between farm size and productivity in slovakia', *Visegrad Journal on Bioeconomy and Sustainable Development*, vol. 4, no.2, pp. 46-50.

Lane, PR & Tornell, A 1996, 'Power, growth, and the voracity effect', *Journal of Economic Growth*, vol. 1, no. 2, pp. 213-241.

Lee, R & Mason, A 2010, 'Fertility, human capital, and economic growth over the demographic transition', *European Journal of Population/Revue européenne de Démographie*, vol. 26, no.2, pp. 159-182.

Lewis, WA 1954, 'Economic development with unlimited supplies of labour', *The Manchester School*, vol. 22, no.2, pp. 139-191.

Lutz, W, Cuaresma, JC & Sanderson, W 2008, 'The demography of educational attainment and economic growth', *Science*, vol. 319, pp. 1047-1048.



Mahadevan, R. (2007). *Sustainable growth and economic development: A case study of Malaysia*. Edward Elgar Publishing.

Malthus, TR 1798, *An essay on the principle of population*. London.

Malaysia Investment Development Authority (MIDA)'s Official Website, viewed 15<sup>th</sup> August 2018

<<http://www.mida.gov.my/home/malaysia-economic-corridors/posts/>

Manca, F 2012, 'Human capital composition and economic growth at the regional level', *Regional Studies*, vol. 46, no. 10, pp. 1367-1388.

Mankiw, NG, Romer, D & Weil, DN 1992, 'A contribution to the empirics of economic growth', *The Quarterly Journal of Economics*, vol. 107, no.2, pp. 407-437.

Matsuyama, K 1992, 'Agricultural productivity, comparative advantage, and economic growth', *Journal of Economic Theory*, vol. 58, no. 2, pp. 317-334.

Mellor, JW 1995, *Agriculture on the road to industrialization*. International Food Policy Research Institute, Johns Hopkins University Press.

Mideksa, TK 2013, 'The economic impact of natural resources', *Journal of Environmental Economics and Management*, vol. 65, no.2, pp. 277-289.

Musibau, BA & Rasak, AA 2005, 'Long run relationship between education and economic growth in Nigeria: evidence from Johansen's cointegration approach', Cornell University, Dakar- Senegal.

Manca, F. (2012). Human capital composition and economic growth at the regional level. *Regional Studies*, 46(10), 1367-1388.

Murthy, N.R. Vasudeva, Chien I.S, 1997, The empirics of economic growth for OECD countries: some new findings, *Economic Letters*, 55, pp.425-429

National Audit Department Malaysia 2005-2015, 'Government financial statements and financial management departments (various states)', Auditor's General Report.

Nawaz, S, Iqbal, N & Khan, MA 2014, 'The impact of institutional quality on economic growth: panel evidence', *Pakistan Development Review*, vol. 53, no. 1, pp. 15-31.

OECD 2011, 'The economic significance of natural resources: key points for reformers in Eastern Europe, Caucasus and central Asia', viewed 14<sup>th</sup> August 2016

<[http://www.oecd.org/env/outreach/2011\\_AB\\_Economic%20significance%20of%20NR%20in%20EECCA\\_ENG.pdf](http://www.oecd.org/env/outreach/2011_AB_Economic%20significance%20of%20NR%20in%20EECCA_ENG.pdf)>

Owens, T, Hoddinott, J & Kinsey, B 2003, 'The impact of agricultural extension on farm production in resettlement areas of Zimbabwe', *Economic Development and Cultural Change*, vol. 51, no. 2, pp. 337-357.

Pelinescu, E 2015, 'The impact of human capital on economic growth', *Procedia Economics and Finance*, vol.22, pp. 184-190.

Poonyth, D, Hassan, R, Kirsten, JF & Calcaterra, M 2001, 'Is Agricultural sector growth a precondition for economic growth? The case of South Africa', Working paper 2001-01, Department of Agricultural Economics, Extension and Rural Development, University of Pretoria, Pretoria, South Africa.

Prantilla, EB 1981, *National development and regional policy*. vol. 3. Maruzen Asia.

Ramos, R, Surinach, J, & Artís, M 2012, 'Regional economic growth and human capital: the role of over-education', *Regional Studies*, vol. 46 no.10, pp. 1389-1400.

Ranis, G & Fei, JC 1961, 'A theory of economic development', *The American Economic Review*, vol. 51, no. 4, pp. 533-565.

Rodríguez-Pose, A & Vilalta-Bufi, M 2005, 'Education, migration, and job satisfaction: the regional returns of human capital in the EU', *Journal of Economic Geography*, vol. 5, no.5, pp. 545-566.

Sachs, JD & Warner, AM 2001, 'The curse of natural resources', *European Economic Review*, vol. 45, no. (4-6), pp. 827-838.

Sala-i-Martin, X & Subramanian, A 2003, 'Addressing the Natural Resource Curse: An Illustration from Nigeria', NBER Working Paper 9804

Sertoglu, K, Ugural, S & Bekun, FV 2017, 'The contribution of agricultural sector on economic growth of Nigeria', *International Journal of Economics and Financial Issues*, vol.7, no. 1

Schultz, TW 1961, 'Investment in human capital', *The American Economic Review*, vol. 51, no.1, pp 1-17.

Simon, JL 1981, *The Ultimate Resource*. Princeton: Princeton University Press.

Simon, JL 1989, 'On aggregate empirical studies relating population variables to economic development,' *Population and Development Review*, vol. 15, pp. 323-332

Singh, M & Kaur, H 2011, 'Economic growth and inter-sectoral linkages in India', *Elixir Production Management*, vol. 31, pp. 1911-1913.

Solow, RM 1956, 'A contribution to the theory of economic growth', *The Quarterly Journal of Economics*, vol. 70, no.1, pp. 65-94.

Sonmez, FD & Sener, P 2009, 'Effects of human capital and openness on economic growth of developed and developing countries: a panel data analysis', *Int. J. Soc. Hum. Sci.*, vol. 3, pp. 633-637.

StataCorp 2013, *Stata: Release 13. Statistical Software* College Station, TX: StataCorp LP, viewed 2<sup>nd</sup> August 2017,  
<<https://www.stata.com/manuals13/rreg3.pdf>>

Subramaniam, V & Reed, M 2009, 'Agricultural inter-sectoral linkages and its contribution to economic growth in the transition countries', in *International Association of Agricultural Economists Conference*, Beijing, China.

Sultan, P 2008, 'Trade, industry and economic growth in Bangladesh', *Journal of Economic cooperation*, vol. 29, no. 4, pp. 71-92.

Szirmai, A & Verspagen, B 2015, 'Manufacturing and economic growth in developing countries, 1950–2005', *Structural Change and Economic Dynamics*, vol. 34, September, pp. 46-59.

Tartiyus, EH, Dauda, MI & Peter, A 2015, 'Impact of population growth on economic growth in Nigeria', *IOSR Journal of Humanities and Social Science (IOSR-JHSS)*, vol. 20, pp. 115-123.

Temple, J 1999, 'A positive effect of human capital on growth', *Economics Letters*, vol. 65, no.1, pp 131-134.

Thapa, S. (2007). The relationship between farm size and productivity: empirical evidence from the Nepalese mid-hills. MPRA Paper No. 7638, posted 12. March 2008 00:16 UTC

Tocco, B., Bailey, A., & Davidova, S. (2013). *Determinants to leave agriculture and change occupational sector: Evidence from an enlarged EU* (No. 152324). International Agricultural Trade Research Consortium.

Torvik, R 2002, 'Natural resources, rent seeking and welfare', *Journal of Development Economics*, vol. 67, no.2, pp. 455-470.

Valeriani, E & Peluso, S 2011, 'The impact of institutional quality on economic growth and development: An empirical study', *Journal of Knowledge Management, Economics and Information Technology*, vol. 1, no. 6, pp. 1-25.

Wang Y & Liu S 2016, 'Education, human capital and economics growth: empirical research on 55 countries and regions (1960-2009),' *Theoretical Economics Letter*, vol. 6, pp. 347-355, viewed 12 September 2016  
<<http://dx.doi.org/10.4236/tel.2016.62039>>

Wig, T & Tollefsen, AF 2016, 'Local institutional quality and conflict violence in Africa', *Political geography*, vol. 53, pp. 30-42.

Wilson, RA & Briscoe, G 2004, *The Impact of human capital on economic growth: a review. Impact of education and training. Third report on vocational training research in Europe: Background Report*. Luxembourg: EUR-OP.

*World Development Report 1984, World Bank*. Oxford University Press.

Yıldırım, A & Gökalp, MF 2016, 'Institutions and Economic Performance: A Review on the Developing Countries', *Procedia Economics and Finance*, vol. 38, pp. 347-359.

Zamhari, A 2016, Chinese still have it good in M'sia, says ex-MCA chief Koon Swan, Malaysiakini

<<https://www.malaysiakini.com/news/355972>>

Zellner, A & Theil, H 1962, 'Three-stage least squares: simultaneous estimation of simultaneous equations', *Econometrica: Journal of the Econometric Society*, vol. 30, no. 1, pp. 54-78.

Zhuang, J, de Dios, E, & Martin, AL 2010, 'Governance and institutional quality and the links with economic growth and income inequality: With special reference to developing Asia', Asian Development Bank Economics Working Paper Series No. 193

## Chapter 3: Fiscal decentralisation and convergence in government spending

### Abstract

The first objective of the study is to examine whether there is a convergence in development expenditure across Malaysian states. The second objective is to investigate the importance of decentralisation in affecting the pattern of development expenditure during the short run and long run. The convergence analysis involved the data of annual growth for the short run, and average three-year and five-year growth for the long run from 2000 to 2015. The study uses panel data approaches of pooled OLS, fixed effects and random effects estimation procedures. The findings lend empirical evidence on the development expenditure convergence within the states during both short run and long run. It is also found that all fiscal decentralisation indicators (state per capita revenue, state-sourced per capita revenue, state-sourced revenue as a share of total revenue and state-sourced capacity as a share of the national average) are imperative in influencing the fiscal behaviour of state governments in Malaysia. Not only these but also the assistance from the federal government through transfer payment is needed to strengthen the expenditure capacity of Malaysian states.

### 3.1 Introduction

In the previous chapter, the influence of variations in economic growth towards the trend in the spatial balance of socio-economic development across Malaysian states is discussed. Though some development indicators have demonstrated a decline in the disparity in spatial development outcomes, it is worth noting from the development index that the performance of less developed states has fallen back of the developed states. The study also showed that institutional factors affect variation in economic growth between states. While the objective of the national policy is inclusive, the effectiveness of a similar package of policies can differ across states or jurisdictions within a country. According to the Post-Washington Consensus, different institutional factors and country-specific organisations have been major constraints against the achievement of similar results from policies across states (Kalirajan & Otsuka 2012). The difference in state-level effectiveness lies in the capacities of the different states as well as the political and administrative rule. In other words, the states might have similar resources and spending but different development outcomes as a result of factors such as governance and institutions. In this context, one of the major considerations in relation to public finance and development plans is the presence of decentralisation.

Decentralisation or devolution of political, fiscal and administrative power from the central to subnational governments may be significant in facilitating spatially equitable development (Kim 2008). Socio-economic indicators are expected to improve with the provision of local public services, which are theoretically agreed to be more efficiently delivered through decentralisation.<sup>18</sup> The function of decentralisation is delivered effectively if there is a declining variation in spatial socio-economic development. Nevertheless, it is a challenge for states to offer equitable level of public services, due to different fiscal capacities resulting from the decentralisation (Boadway 2001). However, incomparable levels of public services at the state level are not just due to revenue-raising capacity but also depending on the need for, and costs of provision of, public services.

Each state is entitled to similar level of public services, which means that the population in any area should have the same access to education and training, health, crime prevention, and other features (Mackay 2001 as cited in Gripaios 2002). Government spending is endogenous to a country's inclusive growth, used to build

---

<sup>18</sup> Some studies find that decentralisation promotes efficiency in public service (Sow and Razafimahefa 2015; Kim 2008)

infrastructure, human and social capital. Spending is expected to promote improved social and economic development through the provision of services. Different levels of government spending on the provision of public services may reflect different levels of access to public services across regions. Faguet and Shami (2008) suggest that local specific investment is the best way to overcome the spatial inequality that results from variations of infrastructure or public assets, while investment in connectivity-type goods is the best way to foster equality in respect to differential access to markets, or to a particular resource (e.g., a natural resource, or knowledge and information).

Since variation in public services has been a major cause of spatial imbalance, this study seeks to examine the pattern of fiscal spending across states on social and economic development. This study examines whether the distribution of development expenditure across developed and less developed states in Malaysia is likely to be 'converging' or 'diverging' over time. The Federation of Malaysia consists of federal and state governments that are responsible for national development as a whole. In this context, this study attempts to analyse whether decentralisation indicators and federal transfers have an impact on the development expenditure pattern across Malaysian states. Besides this, the study compares the evidence of convergence during the short run and long run. The following section discusses federalism and inter-governmental relationships of Malaysia.

### **3.2 Federation of Malaysia**

The Malaysian Constitution as a framework for the country's inter-governmental relationships governs the Federation of Malaysia. The Ninth Schedule of the Constitution highlights the legislative powers of federal territories and states in Malaysia. Table 3.1 lists the subject matter of the federal and state laws split into three categories: federal, state and concurrent (both federal and state governments) powers. The Parliament may create laws for the whole country, or for any matters in a federal list or the concurrent list where the effects of laws may be both external and within the federation. The lists show that the federal government has legislative authority over the states in most matters, including social and economic areas such as trade, commerce and industry, shipping, communication and transport, education, and medicine and health. Meanwhile, the state governments deal with Muslim issues and practices, lands and mines, agriculture and forestry, local government and public services such as graveyard, markets and fairs, cinemas and theatres licences, state government

machinery and water, state holidays, offences and compensations in regard to state matters, and turtles and river fishing.

Both federal and state governments share responsibilities for social well-being, scholarships, birds and wildlife conservation, town and country planning, drainage and irrigation, public health, culture and sports, housing and water services. Federal government power prevails if there is an inconsistency between federal and state law. The power of the states in Malaysia in pursuing their socio-economic development portfolios of healthcare, education and infrastructure are limited to federal autonomy, as these matters are governed by the law set up by the federal government. This condition implies that the welfare of people across the states depends greatly on the federal government even though public service functions may be administered by different states. Finally, Sabah and Sarawak are granted special constitutional status in both the state list and the concurrent list, as reflected in the supplementary list in Table 3.1.



**Table 3.1: Distribution of legislative powers between Federation and states**

Federal List	State List	Concurrent List (federal-state)
1. External relations	1. Muslims issues and practices	1. Social well-being
2. Defence	2. Land	2. Scholarship
3. Internal protection	3. Agriculture and forestry	3. Birds and wildlife conservation
4. Civil and criminal law and justice legal system	4. Local government	4. Animal husbandry
5. Nationality and citizenship	5. Local facilities - lodging houses, graveyard, pounds and cattle trespassing, markets and fairs, and theatres and cinemas licenses	5. Town and country planning
6. Machinery of federal government	6. Machinery of state government	6. Vagrancy law and licensing of itinerant hawkers
7. Finance	7. State controls and water	7. Public health
8. Trade, industry and commerce	8. State holidays	8. Irrigation and drainage
9. Shipping, navigation and fisheries	9. State purposes inquiries	9. Mine and land rehabilitation
10. Communication and transport	10. Offences and compensation in regard to state matters	10. Fire safety measures
11. Federal works and control	11. Turtles and river fishing	11. Culture and sports
12. Surveys, inquiries and research	Supplement to state list for the states of Sabah and Sarawak	12. Housing and accommodation provisions
13. Education	1. Native law and customs	Supplement to state list for the states of Sabah and Sarawak
14. Medicine and health	2. Incorporation of state authorities and other organisations	1. Personal law
15. Labour and society protection	3. Ports and harbours not included in federal control	2. Adulterated food and other goods
16. Aborigines welfare	4. Cadastral surveying	3. Below fifteen tons shipping
17. Licensing the professional	5. Museum and library	4. Water power
18. Federal holidays	6. The Sabah Railway in Sabah	5. Research in agriculture and forestry
19. Unincorporated societies		6. Charities and charitable trusts
20. The control of agriculture pest		7. Theatres, cinemas and places for entertainment
21. Publications		
22. Censorship		
23. Theatres and cinemas		
24. Improvement trusts and federal housing		
25. Incorporated societies		
26. Fire protection		

Source: The Constitution of Malaysia as cited in Anuar (2000)

An important feature of Malaysian federalism is the placing of financial matters firmly in federal government hands. A state has limited power to borrow, only being allowed to borrow directly from the federal government, otherwise from a bank or other financial source for a period not exceeding five years when given approval by the federal government. The Constitution lays out limited powers for the states on taxation and other sources of revenue, in Article 110 and Part III of the tenth schedule. Almost all kinds of tax income are vested to the federal government, while the state is provided with royalties derived from petroleum, export duties on minerals such as tin, ores, metals and other mineral oils produced in the state, excise duty on toddy shops, forests, land and mines, and excise duty on entertainment. Other sources of revenue include rental charges on state property, licensing fees, the charge on water, and Islamic religious revenue i.e., *Zakat*, *Fitrah* and *Baitumal*. Despite all these sources of revenue, all the powers on the taxation of minerals are delivered to the federal government. In return, the federal government pays each individual state a portion of the export duties levied on that state's production. Petroleum revenues are treated differently from the above, the royalty-sharing arrangements between the federal and state governments for offshore oil meaning are counted directly as state government revenue, and not as a grant from the federal government.

### **3.3 Convergence in state government expenditures**

This section quantifies the past behaviour of expenditure development across Malaysian state governments based on convergence theory. Barro and Sala-i-Martin (1990) discuss two definitions of the concept of convergence. First, convergence implies on the growth of per capita income in an economy against the growth of per capita income across all economies ( $\beta$ -convergence). Conversely, the second definition of convergence is related to the increase or decrease in cross-sectional dispersion of per capita income over time ( $\sigma$ -convergence). The standard neo-classical approach of Solow's (1956) growth model predicts that absolute convergence happens, as there is a diminishing marginal return of capital and labour in more developed and capital-abundant countries. As a result, there is a flow of capital and labour to less capital abundant countries and higher wages, hence raising the productivity in these countries. All parameters (e.g., population growth rate, saving rate, production function) are assumed to be similar so that economies will have the same steady state in their capital-labour ratio and income. Moving towards their steady states, economies with lower values of initial capital-labour ratio and income (poor economies) tend to have higher growth in their capital-

labour ratio and also higher growth in income as compared to economies with higher initial capital (rich economies). This condition implies that there is a convergence of the poor countries or regions towards those with a higher capital-labour ratio and income.

Conditional convergence is obtained by controlling the other determinants of the stable state (Kaitila 2005). According to this hypothesis, as the differences in the steady states of the capital-labour ratio and income are identified, or for other structural characteristics, the convergence occurs as per capita income in a country and moves towards its long-run growth path. Countries with lower per capita income are expected to have higher expected growth. The graphical differences between absolute and conditional convergence are explained in a study conducted by Timakova (2011). Both concepts state that countries will converge to one identical point. Hence, the results of convergence can be observed after controlling the structural differences in the economy as represented by the negative relationship between the initial level of income per capita and subsequent growth (Timakova 2011).

Besides indicating at income, the previous literature has investigated the degree of convergence in the area of public finance (Pan, Wang, Qin & Zhang 2013; Apergis, Christou & Hassapis 2013; Deller & Skidmore 2005; Skidmore, Toya & Merrimen 2004; Annala 2003; Afxentious & Serletis 1996). Earlier work by Annala (2003) adds three assumptions to explain convergence in government activity. These assumptions are (1) population growth is exogenous, (2) the population and labour force are the same, and (3) the tax imposed is a fixed proportion of output. Given a tax that is a constant proportion of output, the growth rate of tax will be equal to the growth rate of output. Besides this, as taxes are used to finance government spending, the growth rate of government activity will be equal to both the growth rate of taxes and the growth rate of output. Applying the same concept of convergence as Solow (1956), this study assumes that convergence of income or output is also related to convergence of taxes and government activity. This study tests for convergence in US fiscal policies in the areas of total taxes and three divisions of tax revenue (property, general sales and income tax), as well as five categories of local government expenditure (general, education, highways, welfare and hospital expenditure). This study reports some findings on convergence in those fiscal policies. Skidmore et al. (2004) discuss the convergence in government expenditure in the basis of theoretical model. The study shows that the level of government spending ( $G_t$ ) is a function of the share ( $\tau_t$ ) of previous output ( $Q_{t-1}$ ). On the other hand, per capita output,  $q_t$  is given as a function

of private capital ( $k_t$ ) and public inputs ( $g_t$ ). From these two functions, this study formulates the approximate production function with Cobb-Douglas constant returns to scale, as below:

$$G_t \equiv \tau_t A L_{t-1} k_{t-1}^\alpha g_{t-1}^\beta \quad (1)$$

From equation (1), growth in per capita government expenditure is obtained as follows:

$$\ln\left(\frac{g_t}{g_{t-1}}\right) \approx \ln A \tau_t - n_t + \alpha \ln k_{t-1} + (\beta - 1) \ln g_{t-1} \quad (2)$$

Based on equation (2), government spending is specified as a function of lagged values of private ( $k_{t-1}$ ) and public ( $g_{t-1}$ ) capitals, growth of the population ( $n_t$ ) and its share of the total output ( $\tau_t$ ). Similar to private capital, government spending also experiences diminishing marginal returns ( $\beta < 1$ ). Therefore, holding other variables constant, the higher level of initial government expenditure is associated with lower growth in current government expenditure, and vice versa for a lower level of spending. Hence, there will be convergence in government expenditure over time.

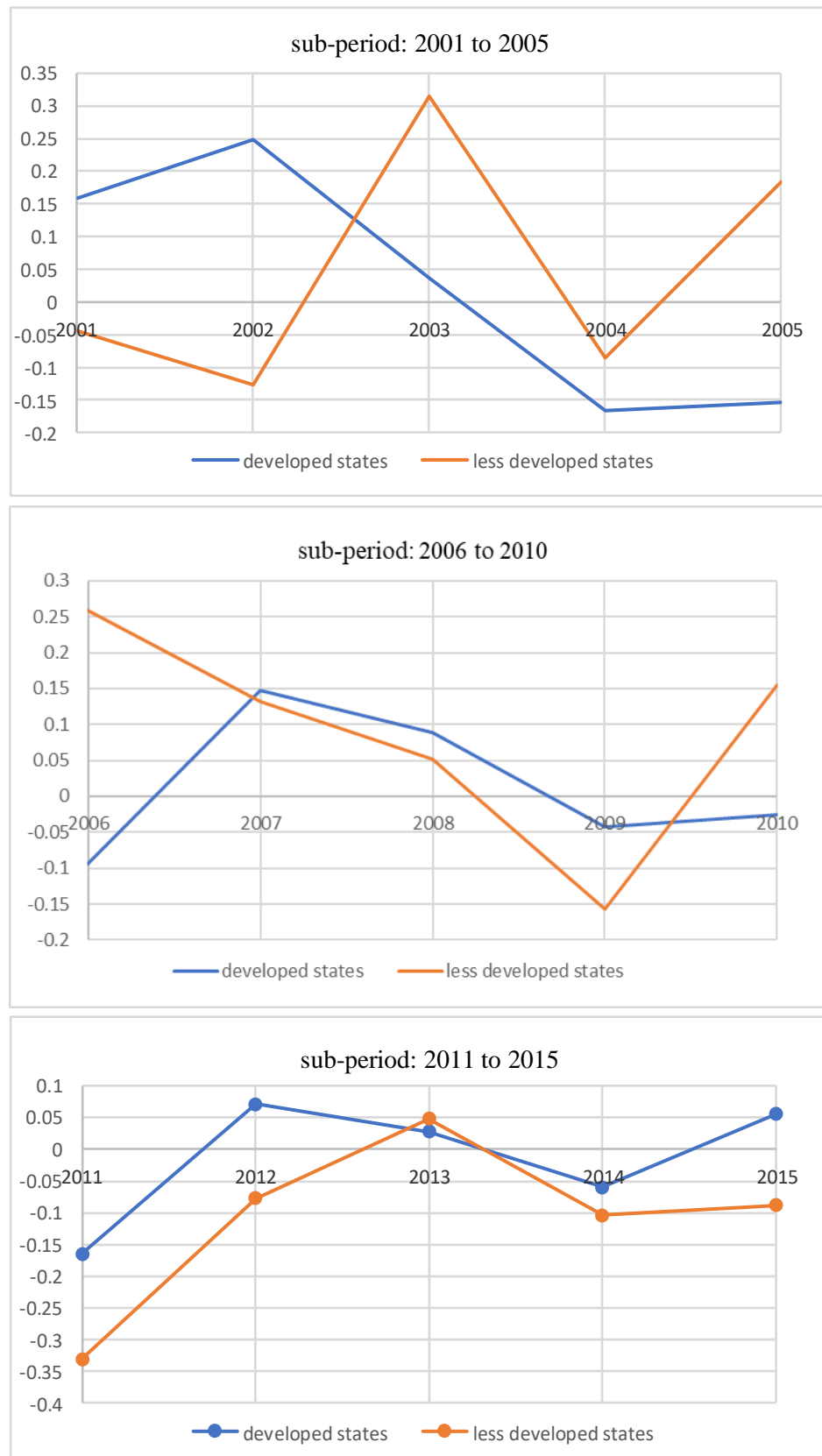
This situation supports the convergence hypothesis as previously discussed. Skidmore et al. (2004) also add that convergence happens due to the diminishing of marginal utility in consuming each additional unit of government goods and services. It is argued that the marginal benefit obtained from an extra government spending is higher for the citizens of countries with low initial level of government spending than for those with high level of government spending. As a result, countries with the former condition will increase their spending, hence experiencing very high growth rates that will allow them to catch up with the countries with high initial level of government spending.

Previous studies on convergence in government expenditure have focused on different categories of fiscal policies and expenditure, have reported mixed results ((convergence: Zhang, Zhang, Wu, Xia & Lu 2016 and Pan, Wang, Qin & Zhang 2013 (government health expenditure); Garg 2015 (education, health and development expenditure); Annala 2013 (tax revenue, highway, education and general expenditure); Deller & Skidmore 2005 (protection services, road, waste services and quality of life services expenditure); Skidmore et al. 2004 (consumption, capital and education expenditure); divergence: Pan et al. 2013 (government health expenditure); Annala

2013 (public welfare and health expenditure); Apergis et al. 2013 (public expenditure); Afxentiou & Serletis 1996 (subsidies)).

Along with convergence analysis, the literature has examined the impact of institutional factors on changes in government spending. A recent study by Garg (2015) includes governance and some categories of federal transfers as determinant of the growth in government expenditure across Indian states. The study finds that better governance and transfers from central government have strengthened the subnational governments' capacity to cultivate expenditure growth across states. In addition, Kalirajan and Otsuka (2012) use a decentralisation index to determine the influence of the devolution of resources from central government, and that of the state capacity to collect revenue, on the tendencies in government spending. The study shows that a greater level of decentralisation has facilitated higher growth in government expenditure. In this study, decentralisation indicators are included as well as federal transfers to examine their impact on the spatial equity pattern of Malaysian state governments' development expenditure. To the best knowledge of the author, this study is the first to quantify the impact of decentralisation indicators on the pattern of expenditure growth in the context of Malaysia.

Figure 3.1 depicts the pattern of inter-state differences in the growth of development expenditure, between developed and less developed states, for three five-year periods of 2001 to 2005, 2005 to 2010 and 2011 to 2015. Overall, the figure depicts the convergence of less developed states to developed states, in terms of their development expenditure, in some phases. Initially, the growth rate of development expenditure in the developed states was higher compared to the less developed states. However, less developed states improved from 2002 to 2007, and again after 2009, when the higher expenditure growth in the less developed states was accompanied by a decline in the growth in expenditure in the developed states. From the year 2011 onwards, it is evident that the less developed states are catching up with the developed states at a faster rate, with increasing growth rates of development expenditure. Following 2014, there is an upward trend in the growth of development expenditure for both developed and less developed states. Further convergence analysis will be carried out using a regression framework on the convergence model, based on Barro and Sala-i-Martin's (1995) work, to reveal whether the development expenditure across Malaysian states is likely to be 'converging' or 'diverging' over time.



Author's calculation

**Figure 3.1: Growth rate of development expenditure between developed and less developed states**

### 3.4 Methodology

#### 3.4.1 Data and sources of data

The Federation of Malaysia consists of three federal territories and thirteen state governments. As the three federal territories of Kuala Lumpur, Labuan and Putrajaya are administered by the federal government; this study looks at the thirteen state governments, namely Johor, Melaka, Negeri Sembilan, Pulau Pinang, Perak, Perlis, Selangor, Kedah, Kelantan, Pahang, Terengganu, Sabah and Sarawak, over the period from 2000 to 2015. The data on expenditure and revenue were obtained from the yearly financial statements of state governments, retrieved from the National Audit Department website. The Ministry of Finance supplied the data on transfers from the federal government, while state per capita GDP (GSDP) and state-level population were retrieved from the Economic Planning Unit, Prime Minister's Department. This study used linear interpolation to obtain missing data on the GSDP for the year 2001, 2002 and 2004. The expenditure, revenue, and transfer variables were deflated using the consumer price index of 2010 as the base year, to obtain the values in real prices. GSDP is also at constant 2010 prices.

#### 3.4.2 Model and specifications

The disparity in state government expenditure is analysed based on the concept of the convergence model. As this study is interested in fiscal expenditure convergence in the Malaysian states, it uses the  $\beta$ -convergence model to reveal that the growth rate of poor economies in catching up with rich economies. It describes the speed of convergence between states with lower per capita expenditure and those with higher spending per capita. The model is further examined based on two types of convergence model: unconditional and conditional. Unconditional convergence is obtained by regressing the growth of real government expenditure only upon its initial level. Meanwhile, conditional convergence refers to a condition where there is a negative relationship between the initial level of government spending and its average growth rate after explanatory variables are controlled. The study includes revenue decentralisation instruments to study the importance of institutional factors and other possible determinants that might affect the convergence of state governments' expenditure in Malaysia. The conditional convergence equation of this study is based on Barro and Sala-i-Martin's (1995) methodology of income convergence as defined below:

$$\ln \frac{Y_{it}}{Y_{it-1}} = \alpha + \beta_0 \ln Y_{it-1} + \beta_1 (Dec_{it}) + \beta_2 (X_{it}) + \varepsilon_{i,t} \quad (3)$$

where  $Y_{it}$  refers to current per capita real expenditure of state ‘i’, while  $Y_{it-1}$  denotes the initial level of per capita expenditure. The estimated coefficient of  $Y_{it-1}$  is expected to have a negative indication, implying convergence of development expenditure across states. Next, the variable revenue decentralisation ( $Dec$ ) is included to measure the impact of the fiscal autonomy of state governments on the development expenditure pattern. This study postulates a positive sign for the estimated coefficient, which would infer that a state with more revenue had more fiscal capacity, hence higher expenditure than a state with lower revenue. On the other hand,  $X_{it}$  refers to control variables of initial per capita  $GSDP$ , and population growth of individual state ‘i’ in particular year ‘t’.

With regard to revenue decentralisation indicators, the study employs total state revenue in the first model but splits the total revenue into transfers from the federal government and the own fiscal capacity of the states in the remaining three models. Including federal transfers helps us to understand the level of reliance of state governments on the federal government’s assistance in making their development expenditure decisions. Meanwhile, the fiscal capacity of the state is proxied by three different measures. The state-sourced revenue at the per capita level is used in the second model while the state-sourced revenue as a share of total state revenue is used in the third model. In the fourth model, the study uses the state-sourced revenue as a share of the national average, where the national average is the total of all the state-sourced revenue divided by the number of states. While the first two measures describe the revenue capacity in a particular state, the third captures the inter-state difference in fiscal capacity in meeting their expenditure responsibilities. Based on Wilson’s (1996) work, the state-sourced revenue as a share of the national average is used to explain the horizontal balance across states, which in turn reveals the variation in the amount of per capita revenue available to each state out of the national average.

Initial per capita  $GSDP$  and population growth are included as the control variables. Guided by Wagner’s Law, public economy is affected by the nation’s demand and willingness to pay for services where the income elasticity of demand for public services is elastic (Cameron 1978). It is postulated that state governments will expand



their expenditure if they have a greater level of income. The population growth is incorporated to capture the impact of demographics on the state government's spending. Besides, the government is responsible to ensure adequate public goods and services, and sustain the quality of life of local people that may be affected by the size of the subnational jurisdiction, which can be measured based on the size of the population (De Mello Jr. 2002). In this context, the greater population, the larger size of subnational jurisdiction. It is assumed that states with higher population growth will bear higher costs of public service provision. This may cause state governments to allocate higher spending to benefit all the people in terms of socio-economic development. From another viewpoint, an increase in population would increase the tax base, giving more revenue to the state governments so that they may fulfil their expenditure responsibilities (Goudswaard & Van de Kar 1994). All the variables are transformed into logarithms except for the state-sourced revenue as a share of total public sector revenue and the state-sourced revenue as a share of the national average.

### **3.4.3 Regression framework**

By means of this analysis, the study aims to determine whether the pattern of development expenditure across Malaysian states is affected by similar or different mechanisms of institutional factors during the short run and the long run. The key variables of interest in this study are federal transfers, total state revenue, state-sourced revenue and inter-state differences in fiscal capacity. The convergence in development expenditure across states is analysed based on annual growth for the short run, and average three-year and five-year growth for the long run. The study consists of balanced panel data for thirteen states from 2000 to 2015. Thus, the panel data approaches of pooled OLS, fixed effects and random effects are employed.

First, the study performed the Breusch-Pagan Lagrange Multiplier test for random effects. The chi-bar-square statistic reveals that the null hypothesis of consistency in the pooled OLS is rejected. Therefore, random effects estimation is preferred to pool OLS. Next, the study evaluated the joint significance of state-specific fixed effects based on an F-test. Again, the null hypothesis of the absence of specific effects is rejected. Hence, the study proceeded with fixed effects instead of pooled OLS estimation. In choosing an appropriate model, the study used the Hausman test to decide between fixed effects and random effects. The test supports the rejection of the null hypothesis of using the random effects model in all conditional and unconditional

convergences analyses except for the case of unconditional convergence during the short run. Therefore, the fixed effects model is deemed reliable to explain the fiscal behaviour of state governments in Malaysia. Furthermore, the fixed effects model has controlled time-invariant variables, such as regional factors and number of local governments, which may have an impact on the estimation results. In addition, the study controls the time effect and corrects for heteroscedasticity and autocorrelation using robust standard errors. The study has clustered the state governments in obtaining robust standard errors. The diagnostic test reveals that the model is free from the multicollinearity problem as the variance inflation factor (VIF) for each variable is less than 10<sup>19</sup>. The Hausman test results and VIF scores are reported in the results tables in the following subheading.

### 3.5 Findings and discussion

The study first discusses the results for unconditional convergence, followed by those for conditional convergence. Table 3.2 shows the result for unconditional convergence in real government development expenditure across states in Malaysia. The Hausman test supports the rejection of the null hypothesis of using the random effects model in all unconditional convergences analyses except for the case of annual growth. In this regard, this study reports the results of random effects estimation for the short run (annual growth) but fixed effects estimation for both long run (three-year average and five-year average) growths. Based on Table 3.2, the significant negative coefficient of initial expenditure implies that there has been a decrease in the inter-state disparity in state government development expenditure over the period of year 2000 to 2015. The coefficient of  $\beta_1$  shows that the rate of convergence of government development expenditure across Malaysian states is higher in the long run than the short run. The results imply that the convergence of states with lower initial development expenditure to those with higher initial development expenditure is more likely to occur within three and five years than a year. Statistically, a negative beta coefficient indicates that the lower initial expenditure, the higher the growth of government expenditure towards the stable state. In other words, economies converge in terms of real government development expenditure at a speed of 0.06 percentage points per year and 0.3 and 0.23 percentage points on average over three and five years respectively.

---

<sup>19</sup> Wooldridge (2013) reports that the value 10 is chosen as the cut-off value for VIFs. A multicollinearity problem exists if a VIF value is above 10 (pg. 94).

**Table 3.2: Absolute or unconditional convergence: 2000 to 2015**

Dependent Variable	Constant ( $\beta_0$ )	Initial Expenditure ( $\beta_1$ )
Growth rate in government development expenditure (Annual)	0.3706 (0.1725) [0.032]**	-0.0657 (0.0240) [0.006]***
Hausman Test: Chi-sq. statistics	18.66	
Growth rate in government development expenditure (3-year average growth)	1.5627 (0.3734) [0.001]***	-0.3006 (0.0656) [0.001]***
Hausman Test: Chi-sq. statistics	35.58***	
Growth rate in government development expenditure (5-year average growth)	1.1563 (0.2396) [0.482]***	-0.2290 (0.0471) [0.000]***
Hausman Test: Chi-sq. statistics	30.01***	

Note: Numbers in round and square brackets indicate robust standard errors and p-values respectively. \*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% level respectively.

Next, the results for conditional convergence in real per capita development expenditure are provided in Table 3.3, Table 3.4 and Table 3.5 for annual, three-year average and five-year average periods, respectively. The Hausman tests reveal that the null hypothesis of using the random effects are rejected in all conditional convergence analyses. Therefore, the discussion on the conditional convergence is based on fixed effects estimation results which have been reported in Table 3.3, Table 3.4 and Table 3.5. For the whole analysis, the coefficient of  $\beta_1$  in all models supports the idea that there is a convergence in development expenditure among Malaysian states during the period of 2000 to 2015. The speed of convergence is higher in the conditional models than in the unconditional model. However, the results show that the speed of convergence in the short run is higher than in the long run when we compare annual and average three-year and five-year growth analysis. This finding is contradicted by the earlier discussion of unconditional convergence results, which suggests that evidence of convergence is higher on average over three years than one. Besides this, there is evidence of convergence on average over five years, although the speed of convergence is lowest over this period. The speed of convergence lies between 0.44 and 0.53 points annually, as compared to between 0.44 and 0.48 points per year over three years. Meanwhile, the convergence rate is between 0.27 and 0.28 points in the case of a five-year interval.

**Table 3.3: Conditional convergence in government development expenditure (annual growth)**

Growth in development expenditure	Model 1	VIF	Model 2	VIF	Model 3	VIF	Model 4	VIF
Initial development expenditure	-0.5382*** (0.0619)	3.5	-0.537*** (0.0823)	3.3	-0.4484*** (0.0873)	2.1	-0.4843*** (0.0855)	3.7
Initial GSDP	-0.6384* (0.3633)	1.2	-0.7002 (0.4706)	1.4	-0.9323 (0.6342)	1.5	-0.496 (0.5252)	1.3
Total state revenue	0.5767*** (0.1401)	3.8						
Federal transfers			0.1498 (0.1079)	2.3	0.3299** (0.1462)	4.5	0.1328 (0.1119)	2.3
State-sourced revenue			0.4185*** (0.1393)	3.7				
State-sourced revenue as share of total					0.0132*** (0.0041)	3.8		
Inter-state fiscal capacity							0.0031*** (0.0009)	3.3
Population growth	-0.0205 (0.0453)	1.2	-0.0183 (0.0427)	1.4	-0.0001 (0.0474)	1.3	-0.0085 (0.0531)	1.3
Constant (Control year)	5.7685 (3.9986)		6.805 (5.01)		9.1242 (6.3498)		6.4413 (5.5645)	
Observation	195		195		195		195	
R-squared (within)	0.42		0.3915		0.3475		0.3597	
Hausman Test: Chi-sq statistics	39.82***		39.04***		36.94***		26.92*	

Note: Numbers in brackets indicate robust standard errors. \*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% levels respectively.

**Table 3.4: Conditional convergence in government development expenditure  
(three-year average growth)**

Growth in development expenditure	Model 1	VIF	Model 2	VIF	Model 3	VIF	Model 4	VIF
Initial development expenditure	-0.4467*** (0.0447)	3.1	-0.4854*** (0.0483)	3.2	-0.4434*** (0.0555)	2.3	-0.4722*** (0.0448)	3.6
Initial GSDP	-0.343*** (0.1254)	1.1	-0.3950*** (0.1245)	1.4	-0.6685** (0.2636)	1.5	-0.4464*** (0.1308)	1.3
Total state revenue	0.4532*** (0.0627)	3.4						
Federal transfers			0.1347** (0.0707)	2.9	0.3279** (0.1541)	4.9	0.0927 (0.0739)	2.9
State-sourced revenue			0.4049*** (0.0674)	3.5		3.5		
State-sourced revenue as share of total					0.0142*** (0.005)			
Inter-state fiscal capacity							0.0028*** (0.0005)	3.2
Population growth	0.0219 (0.0439)	1.2	0.0145 (0.0416)	1.5	0.0543 (0.0401)	1.5	0.0354 (0.0533)	1.4
Constant (Control year)	3.0431 (1.4357)		3.6314 (1.58)		6.3535 (2.6708)		6.0502 (1.5556)	
Observation	65		65		65		65	
R-squared (within)	0.823		0.8221		0.7402		0.7777	
Hausman Test: Chi-sq statistics	188.21***		114.55***		50.07***		43.76*	

Note: Numbers in brackets indicate robust standard errors. \*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% levels respectively.

**Table 3.5: Conditional convergence in government development expenditure  
(five-year average growth)**

Growth in development expenditure	Model 1	VIF	Model 2	VIF	Model 3	VIF	Model 4	VIF
Initial development Expenditure	-0.2701*** (0.0147)	2.6	-0.2729*** (0.0222)	2.3	-0.2828*** (0.0326)	2.1	-0.288*** (0.0209)	3.3
Initial GSDP	-0.165** (0.0918)	1.2	-0.1798 (0.1061)	1.3	-0.3237** (0.1237)	1.5	-0.1366 (0.1585)	1.3
Total state revenue	0.2291*** (0.0577)	2.8						
Federal transfers			0.1184 (0.0744)	1.9	0.2504*** (0.0909)	4.3	0.076 (0.0817)	2.7
State-sourced revenue			0.189*** (0.0509)	2.7				
State-sourced revenue as share of total					0.0094** (0.0039)	3.4		
Inter-state fiscal capacity							0.0013*** (0.0004)	2.9
Population growth	-0.0246 (0.032)	1.2	-0.0123 (0.0372)	1.5	0.0149 (0.0325)	1.5	0.0124 (0.0491)	1.5
Constant (Control year)	1.711 (1.2016)		1.6457 (1.3352)		2.8435 (1.5802)		2.2929 (1.649)	
Observation	39		39		39		39	
R-squared (within)	0.8617		0.8676		0.8577		0.8306	
Hausman Test: Chi-sq statistics	153.61***		189.54***		153.56***		243.34*	

Note: Numbers in brackets indicate robust standard errors. \*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% levels respectively.

The conditional convergence in state government development expenditure in Malaysia shows a similar trend to what has happened in other developing countries. Based on a three-year average, a previous study by Kalirajan and Otsuka (2012) provides evidence of convergence in several categories of development expenditure in India at a rate of between 0.20 and 0.26 points. At longer than a five-year interval, Kalirajan, Bhide and Singh (2001) find that the convergence in development expenditure in India is slow at a rate of 0.13 to 0.21 points. On the other hand, the latest research by Garg (2015) shows that annual growth in development expenditure in India converges at a rate of 0.33 to 0.46 points. These three studies support the consistent implication of our findings that the speed of convergence in development expenditure in a developing country such as Malaysia is faster within a short interval than over a longer interval. The results of the study are also in line with Skidmore et al. (2004), who show empirical support for convergence in government consumption as well as capital and education spending in developing countries. Based on a five-year interval, their convergence rate was slow, ranging from 0.02 to 0.1 points.

The analysis also shows characteristics of the state governments that are significant to the spatial equity in overall socio-economic development through the pattern of the expenditure. Beginning with model 1, the results illustrate the importance of state revenue to the growth rate of development expenditure as displayed in Table 3.3, Table 3.4 and Table 3.5. The positive beta coefficient implies that the increase in state revenue would increase the growth in government spending, with the impact highest over one year, followed by the average over the three-year and five-year periods. Based on model 2, it is suggested that state-sourced revenue is important as the source of the growth in government spending across all states. An increase in the level of state-sourced per capita revenue by one point induces a higher growth in inter-state development expenditure of approximately 0.4 points over one year and on average over three years. However, the impact of state-sourced revenue on the growth of expenditure is nearly half of those 0.4 points on average over a longer period of five years. Furthermore, the influence of the level of per capita transfers from the federal government on the pattern of state expenditure in Malaysia can only be realised over three years and no longer than that. These results imply that the level of state-sourced per capita revenue has been a major factor in the growth in government expenditure, despite the level of per capita transfers from the federal government, which has a smaller influence on the change in government expenditure. In addition, the level of per

capita transfers from the federal government is insufficient to promote short-term convergence in the growth of expenditure among states in Malaysia.

Similarly, in model 3, the results show that when state-sourced revenue makes up a higher share of the total revenue, this encourages higher growth in government expenditure. Overall, an increase in the state-sourced revenue as a share of total revenue by one point will escalate growth in government expenditure by more than one point within one year and on average per year over three years but by less than one point on average per year over five years. Meanwhile, the level of per capita transfers from the federal government has a significant effect on the pattern of expenditure growth for Malaysian states, not just in the long term but also in the short term. A similar result is found as for model 2, with the level of per capita transfers having a greater effect on expenditure over one and three years, on average, than over five. The results from model 2 and model 3 show evidence of state government reliance on federal transfers in generating their development spending.

Model 4 includes the state-sourced revenue as a share of the national average, to examine whether differences in inter-state fiscal capacity affect the spending decisions of Malaysian states. As expected, the higher fiscal capacity of particular state governments relative to the average, the higher will be the growth in government spending in that state. A one-point increase causes the growth in government expenditure to increase by 0.3, 0.28 and 0.13 points per year over one, three and five years, respectively. The impact of inter-state fiscal capacity on expenditure growth is smaller in the long term than the short term. This result implies that relative fiscal capacity induces greater expenditure competition among Malaysian states over a short period than a longer period.

Overall, the results indicate that all decentralisation indicators that are measured based on per capita state revenue, state-sourced per capita revenue, state-sourced revenue as a share of total revenue, state-sourced capacity as a share of the national average and per capita federal transfers are imperative in affecting spatial equitability in socio-economic development through the pattern of the development expenditure of the states in Malaysia. The significant positive influence of state revenue on government expenditure is consistent with the previous findings of Zhang et al. (2016) and Kalirajan and Otsuka (2012). Other previous empirical works (Abdul Jalil & Abdul Karim 2008; Garg 2015; Zhang et al. 2016) also support the relevance of federal transfers to the increase in state spending.



As for the other control variables, the estimates indicate that initial state per capita income measured by GDP (GSDP) has a significant negative effect on the growth of development expenditure across states in Malaysia. Though Wagner's Law contradicts the negative effect of initial GSDP on the growth of development expenditure, the negative sign of the coefficient can be linked to the previous study of Abdul Jalil and Abdul Karim (2008), which found a negative relationship between a state's initial GDP and tax efficiency<sup>20</sup>. The study by Abdul Jalil and Abdul Karim (2008) shows that an increase in state per capita income reduces tax efficiency. This result implies that the negative effect of initial per capita income on growth in government spending happens because of tax inefficiency. Besides this, in other interpretations, the negative coefficient of initial GSDP in relation to the growth in development expenditure also implies that an increase in GSDP will increase government development expenditure at a decreasing rate. Meanwhile, population growth is not significant in affecting the growth development expenditure of states in Malaysia.

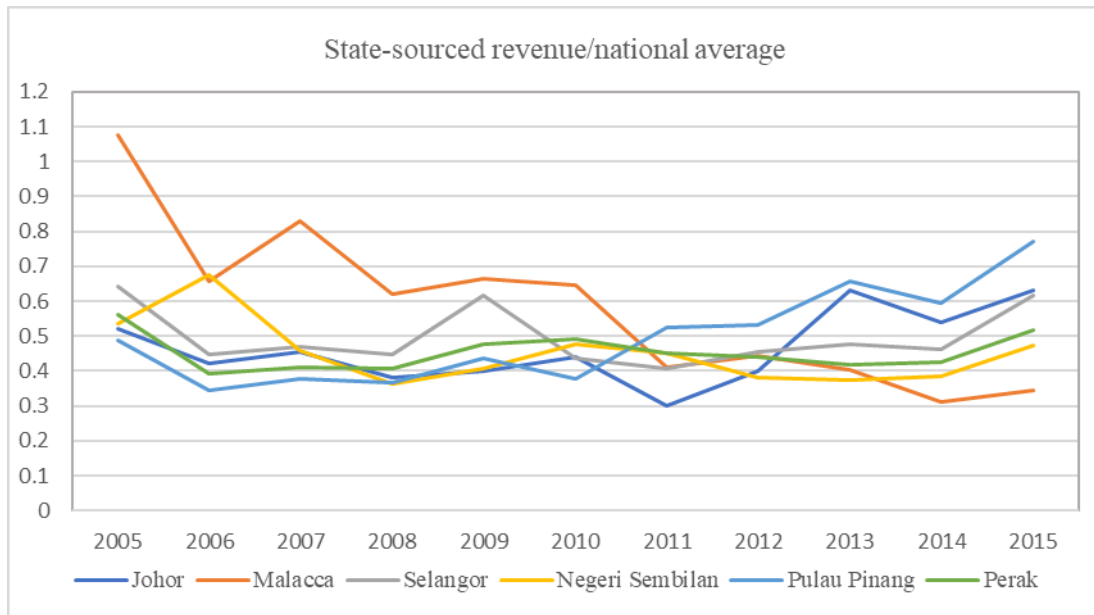
### **3.6 Conclusion and policy recommendations**

Given the importance of government spending to the variation observed in public services, this study has examined the pattern of state government expenditure to try to understand whether there is a convergence in development expenditure and whether fiscal decentralisation across states in Malaysia is functioning effectively. The study has analysed the impact of the institutional factors of state government and federal government resources on changes in the fiscal behaviour of state governments. Generally, the study finds that state governments in Malaysia have fostered equitable spatial development through convergence in development expenditure. The rate of unconditional convergence is faster per year over a duration of three and five years as compared to a one-year period. However, the estimations results reveal that the convergence has occurred more over one year than three years when the impact of other factors, such as decentralisation indicators, initial GSDP and state population growth, are considered. Evidence of convergence is also found over a longer period of five years, although the yearly convergence rate is slower in the shorter timeframes.

---

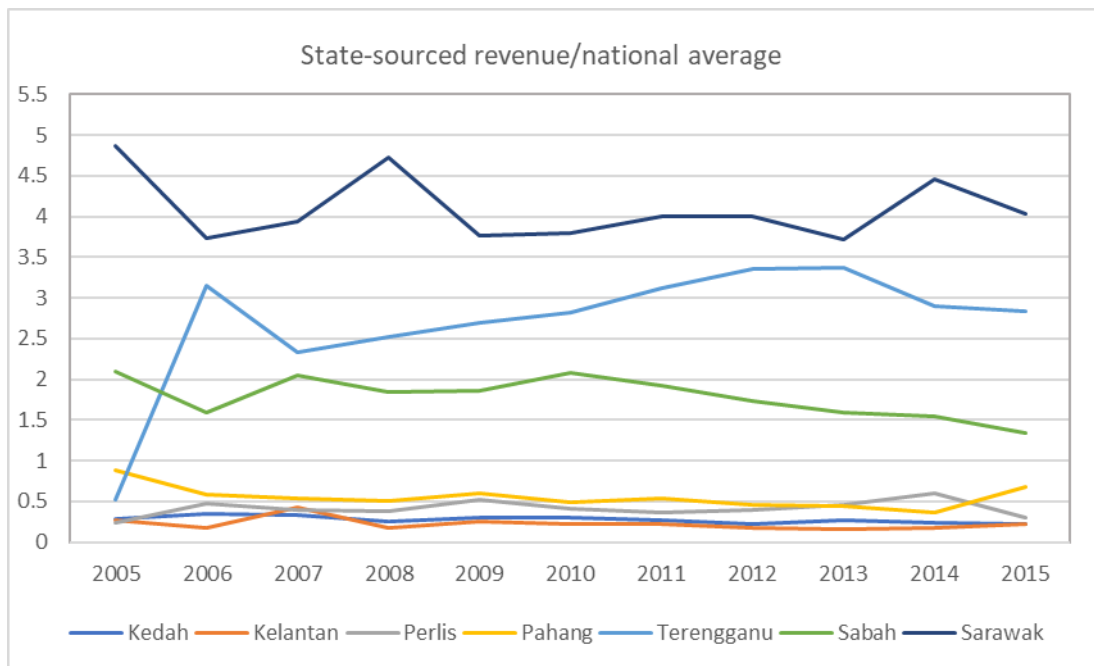
<sup>20</sup> Wagner assumes that growth of national income is vital for public spending, basically arguing that public sectors will grow as per capita income increases (Wagner, 1883).

Overall, the study finds that state per capita revenue, state-sourced per capita revenue, state-sourced revenue as a share of total revenue and state-sourced capacity as a share of the national average have positive effects on the fiscal behaviour of state governments in Malaysia. Besides this, the level of per capita transfers from the federal government is vital to strengthen the expenditure capacity of the Malaysian states. These findings infer that the functioning of state government matters for ensuring a spatially equitable socio-economic development in the aspect of public finance. Hence, the effectiveness of the state governments at collecting revenue and managing the distribution of resources is vital for the process of development across states in Malaysia. Furthermore, these findings confirm previous findings in the first essay that institutional factors play an important role in explaining the variation in growth or overall development across states in Malaysia resulting from the development expenditure of the states. Though the study does not explicitly explain the reasons for the persistent lag in the performance of less developed states, understanding the factors that affect the fiscal behaviour of the states might reduce this gap. In this context, maintaining less variation in state per capita revenue, state-sourced per capita revenue, state-sourced revenue as a share of total revenue and state-sourced capacity as a share of the national average might reduce the dispersion. Furthermore, the federal government of Malaysia, through the transfer mechanism, should pay more attention to less developed states, as the state-sourced revenue in most of these states is insufficient to cultivate growth in their fiscal pattern of development expenditure, as shown in Figure 3.2 and Figure 3.3 below. On the contrary, developed states have better fiscal capacity in terms of their own state-sourced revenue, which is more adequate for their development expenditure compared to the less developed states.



Source: Author's calculation

**Figure 3.2: Horizontal balance among developed states**



Source: Author's calculation

**Figure 3.3: Horizontal balance among less developed states**

## References

Abdul Jalil, A Z & Abdul Karim N A 2008, 'Understanding Malaysian state governments fiscal behavior: the role of intergovernmental transfers', *Chulalongkorn Journal of Economics*, vol. 20, no, 2

Afxentiou, P C & Serletis, A 1996, 'Government expenditures in the European Union: do they converge or follow Wagner's Law?', *International Economic Journal*, vol. 10, no. 3, pp. 33-47.

Annala, C N 2003, 'Have state and local fiscal policies become more alike? Evidence of beta convergence among fiscal policy variables', *Public Finance Review*, vol. 31, no. 2, pp. 144-165.

Anuar, AR 2000, 'Fiscal decentralization in Malaysia', *Hitotsubashi Journal of Economics*, vol. 41, no. 2, pp. 85-95.

Apergis, N, Christou, C & Hassapis, C 2013, 'Convergence in public expenditures across EU countries: evidence from club convergence', *Economics & Finance Research*, vol. 1, pp. 45-59

Barro, R J & Sala-i-Martin, X 1990, 'Economic growth and convergence across the United States', NBER Working paper  
 \_\_\_1995, *Economic growth*, New York: McGraw-Hill

Boadway, R 2001, 'Inter-Governmental fiscal relations: the facilitator of fiscal decentralisation', *Constitutional Political Economy*, vol. 12, pp. 93–121

Cameron, DR 1978, 'The expansion of the public economy: a comparative analysis', *The American Political Science Review*, vol. 72, no. 4, pp. 1243–1261.

Deller, S & Skidmore, M. (2005). Convergence in local Government spending: evidence from Wisconsin. *Agricultural & Applied Economics Staff Paper*, no. 483

De Mello Jr, LR 2002, 'Public finance, government spending and economic growth: the case of local governments in Brazil', *Applied Economics*, vol. 34, no. 15, pp. 1871-1883.

Department of Statistics Malaysia, Official Portal

Faguet, J & Shami, M 2008, 'Fiscal policy and spatial inequality in Latin America and beyond', Policy Research Working Paper Series, The World Bank, Washington, DC, USA.

Federal Constitution of Malaysia 2009, Laws of Malaysia. reprint federal constitution incorporating all amendments up to P.U. (a) 164/2009

Garg, S. 2015, 'Spatial convergence in public expenditure across Indian states: Implication of federal transfers', Indira Gandhi Institute of Development Research, Mumbai, India.

Goudswaard, K & Van de Kar, H. (1994). The impact of demographic change on tax revenue. *Atlantic Economic Journal*, vol. 22, no. 3, pp. 52-60.

Gripaios, P 2002, 'Regional spending: a comment on MacKay', *Regional Studies*, vol. 36, no. 6, 685-689.

Henderson, J 2002, 'Urbanization in developing countries', *World Bank Research Observer*, vol. 17, no. 1, pp. 89-112.

Kaitila, V 2005, 'Integration and conditional convergence in the enlarged EU area', ENEPRI Working Paper, No. 31

Kalirajan, K & Otsuka, K 2012, 'Fiscal decentralisation and development outcomes in India: an exploratory analysis', *World Development*, vol. 40, no. 8, pp. 1511-1521.

Kalirajan, K, Bhide, S & Singh K 2009, 'Development performance across Indian states and the role of the governments', ASARC Working Paper

Kim, S 2008, 'Spatial inequality and economic development: theories, facts and policies', World Bank Working Paper, No. 16

Mackay, R 2001, 'Regional taxing and spending: the search for balance', *Regional Studies*, vol. 35, no. 6, pp. 563-575.

Pan J, Wang P, Qin X, Zhang S 2013, 'Disparity and convergence: Chinese provincial government health expenditures. *PLOS ONE* vol. 8, no. 8.

Skidmore, M, Toya, H & Merriman, D 2004, 'Convergence in Government spending: theory and cross-country evidence, *KYKLOS*, vol. 57, no. 4, pp. 587-620.

Solow, RM 1956, 'A contribution to the theory of economic growth', *The Quarterly Journal of Economics*, vol. 70, February, pp. 65-94.

Sow, MN & Razafimahefa, IF 2015, 'Fiscal decentralisation and the efficiency of public service delivery', IMF Working Paper.

Third Outline Perspective Plan of Malaysia 2001-2010, United Nations Public Administration Network.

Timakova, M 2011, 'Conditional convergence and the Solow model: an empirical study', Unpublished Thesis. Holland: Erasmus University Rotterdam

Wagner A. (1883), *Three Extracts on Public Finance*, translated and reprinted in R.A. Musgrave and A.T. Peacock (Eds), *Classics in the Theory of Public Finance*, London: Macmillan [1958]

Wilson, L S 1996, 'Federal-state fiscal arrangements in Malaysia', *International and development studies working paper*. Kingston, Canada: Queen's University, John Deutsch Institute for the Study of Economic Policy

Wooldridge, J M 2013, 'Introductory econometrics: A modern approach', 5<sup>th</sup> edn, Mason, OH: South-Western, Cengage Learning

Zhang, G, Zhang, L, Wu, S, Xia X & Lu, L 2016, 'The convergence of Chinese county government health expenditures: capitation and contribution', *BMC Health Services Research*, vol. 16, no. 1

# Chapter 4: Does fiscal decentralisation promote economic growth?

## Abstract

Malaysia aims at achieving sustainable and inclusive growth by making the transition to a high-income economy from the middle-income economy. In this context, the study examines the role of fiscal decentralisation as a solution for escaping from the middle-income trap. The study employed annual time series data from 1985 to 2015. The Autoregressive Distributed Lag (ARDL) bound test reveals the presence of long run relationship between the levels of the dependent variable (economic growth) and the regressors (the participation of federal, state and local governments in the economy, labour force and net exports). The results of the study offer a possible solution that could help Malaysia to escape from the stagnant economic growth. It is found that fiscal decentralisation has a positive growth effect on Malaysian economy though the benefits of decentralisation are realised differently at different levels of government. The positive impact of revenue decentralisation is realised at the state but not the local level. In contrast, the opposite results are reported in the case of expenditure decentralisation. The benefits of expenditure decentralisation are accomplished at local but not the state level.

## 4.1 Introduction

Productivity is believed to be the primary tool of economic growth and well-being (OECD 2015). Along with this, decentralisation, as a key element that affects the functioning of markets and economic growth, should be given equal consideration. Meanwhile, the previous chapters have revealed how decentralisation affects the equity of spatial development across states in Malaysia. On the context of the effect of the degree of decentralisation on overall national growth, each level of government, central or subordinate, plays a significant role in utilising the resources in the economy. Both developed and developing economies have implemented various transfers of power, resources, and responsibility, for example, from the central government to subordinate governments or nongovernmental organisations, known as decentralisation (Faguet 2011). Over the decades, researchers have attempted to highlight the significance of fiscal decentralisation as a primary tool for promoting economic growth (Samimi, Petanlar, Haddad & Alizadeh 2010; Martinez-Vazquez & McNab 2003; Akai, Nishimura & Sakata 2004; Zhang & Zou 2001; Oates 1993; Brennan & Buchanan 1980). Fiscal decentralisation can be a possible means of escaping from the traps of inefficient governance, macroeconomic instability, and stagnant economic growth. For these reasons, many developing countries have adopted different forms of fiscal decentralisation (Bird & Vaillancourt 1998). Recent evidence suggests that global trends towards decentralisation have increased in the areas of legitimacy, resources and authority (Rodriguez-Pose & Gill 2003).

The basic argument in favour of fiscal decentralisation is that it improves allocative efficiency in dealing with the diverse needs and conditions of heterogeneous regions or groups within a country. Local governments work closely with local populations and are informed about local preferences, allowing them to provide more desirable public services to the region than the central government (Oates 2007; Rondinelli 1981; Oates 1972; Tiebout 1956). Decentralisation also promotes productive efficiency, as local governments can provide public services at a low cost based on local preferences and needs. Furthermore, fiscal competition among the jurisdictions can lead in preference of the efficient provision of public services (Wilson 1986). The acceptance of this view suggests that decentralisation promotes a more efficient allocation of resources that induces rapid economic growth. From the aspect of democracy, an increase in fiscal decentralisation infers an increase in democratic participation in the process of decision-making, which enhances the accountability and

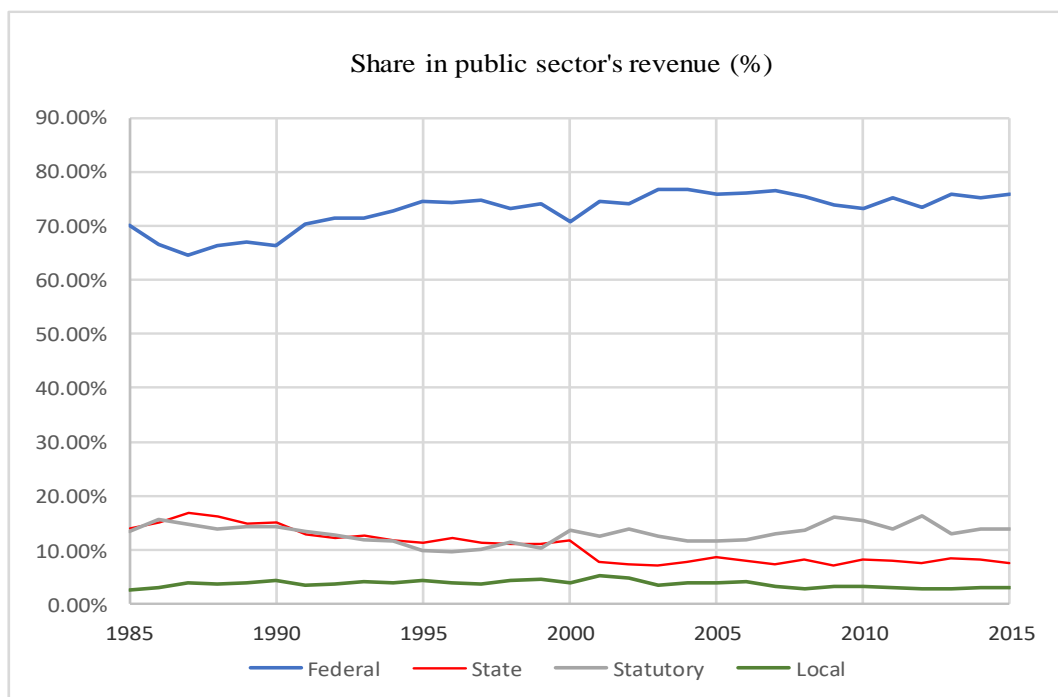


transparency of the government (Dabla-Norris 2006). A significant influence on macroeconomic performance and growth is identified due to decentralisation.

Although many studies are emerging on the influence of decentralisation on the economy in both developed and developing countries, the effects have not been examined widely in the context of the Malaysian economy. Referring to Figure 2.1 in Chapter 2, Malaysia experienced moderate growth during the 2000s. This moderate growth rate has challenged the country's aim of reaching high-income status by 2020. Previous studies of the Malaysian economy have put forward productivity diffusion and human capital development as ways to overcome from the middle-income trap and promote growth (Cherif & Hasanov 2015; Flaaen; Gani & Ishra 2013; Itoh 2012), but fiscal decentralisation as a relevant instrument to counter that economic problem was least emphasized.

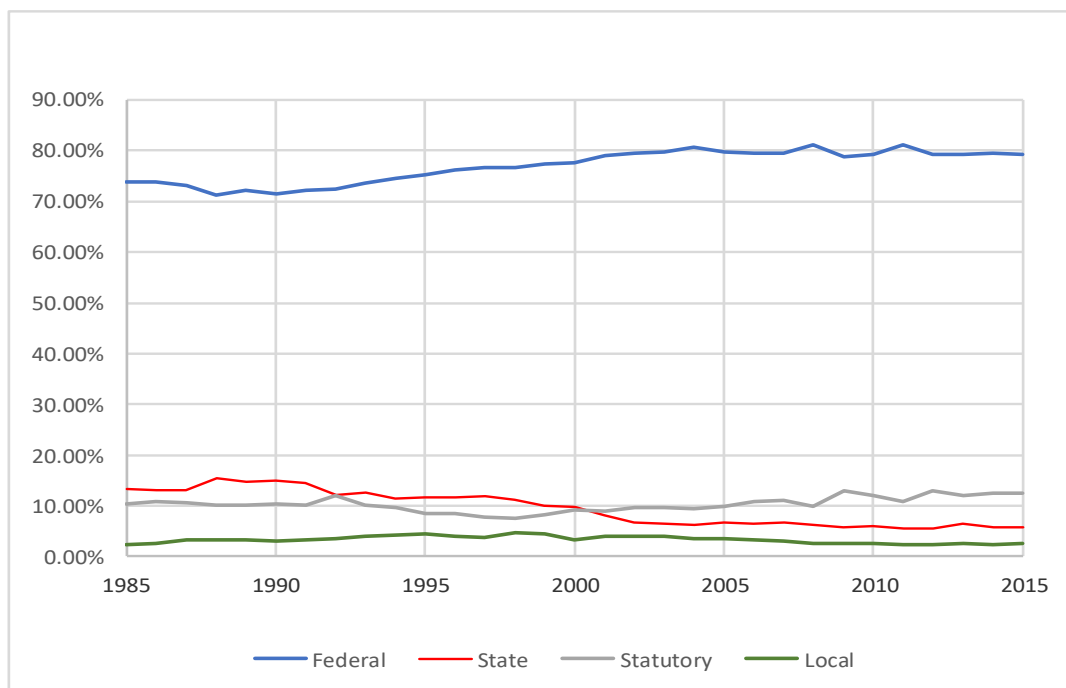
The fluctuation in the Malaysian economic growth might well be explained by institutional factors such as decentralisation. An overview of fiscal decentralisation in Malaysia is provided in Figure 4.1 and Figure 4.2 based on the federal and subnational governments' share of total revenue and spending on the public sector respectively, between 1994 and 2014. Figure 4.1 shows a declining trend in the total public sector revenue share of the states during the 1990s and 2000s. The declining trend is offset by the increase in the federal government's and statutory bodies' share of revenue during the 2000s. From 2001 onwards, federal revenue generally accounts for more than 70 percent of public sector revenue, and the revenue of the states is less than 10 percent. This evidence implies an imbalance in the federal and state finances. This trend was different in the 1990s when the revenue of the states were made up a share greater than 10 percent.

A similar imbalance can be observed in expenditure, whereby an increase in the federal share over the years is offset by the declining share of the states in the most recent decade. The decreasing trends in both the revenue and expenditure shares of the Malaysian states illustrate a reduction of fiscal decentralisation in Malaysia during the 2000s. This coincides with the moderate growth rate in the Malaysian economy during the 2000s. The impact of fiscal decentralisation on Malaysian economic growth is not discussed as well as identified in depth; thus, is worth exploring as the subject matter and is the aim of this research.



Author's calculation <sup>21</sup>

**Figure 4.1: Federal and subnational governments' shares of total public sector revenue**



Author's calculation <sup>22</sup>

**Figure 4.2: Federal and subnational governments' shares of total public sector expenditure**

<sup>21</sup> Data retrieved from Ministry of Finance Malaysia.

<sup>22</sup> Data retrieved from Ministry of Finance Malaysia.

The findings of the study should offer some important insights into the notion that fiscal decentralisation can be a significant factor for economic growth. First, this study should earn the attention of policymakers, as it could help them to review and improve current practice in the fiscal federalism of Malaysia. The second contribution of this study is to provide an empirical analysis supporting the theoretical arguments regarding the advantages of fiscal decentralisation on the economic growth. Lastly, to the best of the author's knowledge, this study is the first of its kind to consider fiscal decentralisation as a main factor in the economic growth of Malaysia. The following sections entail theories and previous empirical studies on fiscal decentralisation and economic growth respectively. The fourth section contains the data, methodology and model, while the fifth contains the findings of the study. The conclusion and policy implications are contained in the last section.

#### **4.2 Theoretical arguments for and against fiscal decentralisation**

The theoretical argument for a positive effect of fiscal decentralisation on economic growth can be explained through several channels. First, fiscal decentralisation can promote greater efficiency. Decentralisation is postulated to overcome the limitations of central control over national planning, by providing better allocative efficiency that deals effectively with the diverse needs and conditions of heterogeneous regions and groups within a country. Assuming neither mobility nor spillover effects, the 'diversification hypothesis' of Oates (1972) argues that uniform public goods provision is inefficient. The marginal benefits and costs of public service provision differ among jurisdictions, due to different demand preferences. Therefore, diversifying the levels of public goods based on local demand is necessary for Pareto efficiency, and this can be achieved through fiscal decentralisation. Local governments that work closely with the local population and are informed about local preferences are considered better at providing desirable public services in particular regions (Oates 2007; Rondinelli 1981 Oates 1972; Tiebout 1956). Supposing local people are mobile, Tiebout (1956) supports the 'diversification hypothesis' that decentralisation induces efficiency as compared to a centralised provision of public services. Population mobility encourages individuals to move to the jurisdictions that match their preferences. In order to satisfy local voters, local governments will competitively respond to the situation by providing public services based on the local preferences (Tiebout 1956).

Second, with mobility, fiscal competition among the jurisdictions leads to the need to provide public services efficiently, since local governments are forced to deliver goods and services at the minimum cost, enhancing producer efficiency, hence improving growth. Drawing on the Leviathan hypothesis of Brennan and Buchanan (1980), tax competition through fiscal decentralisation destroys monopoly taxation by the central government and excessive governmental regulation. Through decentralisation, where each jurisdiction is free to adopt a new approach, this competition may encourage innovation and enhance productivity among subnational jurisdictions (Kalirajan & Otsuka 2012 and Oates 2007). Moreover, residents can use a neighbouring jurisdiction's performance as a comparison; hence increase pressure on their local government for the adoption of better practices and policies that are more relevant. Given these benefits of fiscal decentralisation, the impact of increased efficiency and local government competition on economic growth will be discussed further to illustrate the importance of fiscal decentralisation for economic growth.

In a later study, Oates (1993) argues that based on the principle of the 'diversification hypothesis', decentralisation should have some effect on economic growth. This is because policies formulated for some instruments of economic growth, such as infrastructure and human capital, are sensitive to local conditions and geographical differences. Since central policies might be less concerned with local-specific characteristics, decentralised governments seem to have effective policies to encourage economic development. Martinez-Vazquez and McNab (2003) state that since subnational governments deliver services that match the preferences of local communities; this may increase consumer efficiency, individuals' welfare and secondary effects on work effort, savings, and private investment, which in turn have positive impacts on future economic growth. Decentralisation promotes a better-educated and healthier labour force, and faster and less costly transportation, that could boost future growth. In other words, a more efficient allocation of public resources produces better outputs for economic growth.

The view on fiscal decentralisation and its benefits for efficiency, however, is subject to some dispute in the literature. Prud'homme (1995) claims that the allocative efficiency gains obtained through decentralisation based on the idea of matched preferences of local communities are not large. The main differences between the various local jurisdictions are neither tastes nor local preferences, but other factors such as income and level of basic needs that should be a major concern of the government. Furthermore, Prud'homme (1995) supports the view that centralised government is a

more efficient provider of public services than decentralised government. It is believed that central government entails greater economies of scale and operates closer to the technical production frontier. Central bureaucracies have advantages over local bureaucracies in terms of attracting labour that is more qualified, offering greater career opportunities and having bigger capacity to invest in technology, research, development and innovation. Instead of improving efficiency, higher fiscal competition may also lead to under-provision of public services and basic infrastructure as the jurisdictions attempt to retain their tax bases (Bodman & Ford 2006). Hence, this tax competition can represent a constraint on regional or local economic activity that would ultimately delay growth. The potential efficiency gain of fiscal decentralisation for economic growth has increased the interest of the researchers in investigating whether it is beneficial or detrimental to development policy.

Another controversial issue with fiscal decentralisation in regards of economic growth is its impact on macroeconomic stability. Rodden and Wibbels (2002) explain some advantages of subnational governments over the unitary system, for macroeconomic performance. Federalism often imposes checks and balances on central policymakers, thus preventing from overspending or excessively increasing the money supply in the short term. As subnational or local governments observe the inflationary and deficit bias of central officials, it is more difficult for central policymakers to renege on their macroeconomic commitments. Besides this, subnational governments seem to be more reliable at providing policy responses if economic changes are asymmetrically distributed. The role of subnational governments is important for reducing the overburdening of the central government, since the latter alone is incapable of achieving efficient policy outcomes (Bodman, Campbell, Heaton & Hodge 2009).

According to another view, fiscal decentralisation causes macroeconomic instability, which may hinder future economic growth. Rodden and Wibbels (2002) argue that subnational governments affect the central performance and macroeconomic decisions of a nation by extracting resources from the central government for their own expenditures. Similarly, direct borrowing from the central bank has some costs. Based on the case of Argentina, the World Bank (1990) claims that the financial practices of decentralised states can cause unsustainability in public sector fiscal and quasi-fiscal deficits, and when persistent, such practices can pose challenges to national efforts to maintain price stability and sustainable economic development (cited in Prudhomme 1995). Subnational governments might have fewer incentives than central government to provide economic stabilisation. At the same time, coordination among subnational

governments may be hard to achieve if mutual decisions concerning macro or stabilisation issues are made. Furthermore, the design of fiscal decentralisation involves trade-offs between efficiency and the fair redistribution of resources and macroeconomic stability (Martinez-Vazquez & McNab, 2006). Despite these arguments, there is no conclusion on the significance or direction of the relationship between fiscal decentralisation and macroeconomic stability. If fiscal decentralisation did affect macroeconomic stability, this would have a further implication on economic growth, as previous empirical studies have found negative effects of macroeconomic instability on economic growth (Ramey & Ramey 1995; Dabušinskas, Kulikov & Randveer 2013; Lin & Kim 2014).

From the political economy perspective, fiscal decentralisation strengthens democratic forms of governance that are important factors for long-term economic growth (Thiessen 2000). Fiscal decentralisation is a mechanism to promote accountability, as well as reducing the principal-agent problem. Under the principal-agent model, the electorate acts as the principal and elected officials as agents; decentralisation induces accountability, as the performance of elected officials is easily monitored; hence, the subnational governments more transparent in sharing more information with the residents or voters (Lockwood 2005; Dabla-Norris 2006; and Gemmell, Kneller & Sanz 2013). Accountability can be a force that stimulates efficient government activity, since electorates have control over the elected official's government (Porcelli 2009). According to another view, the local bureaucracies on the governance cannot escape from corruption issue. Decentralisation is associated with corruption if there is excessive rent-seeking activity by local bureaucracies due to greater dispersion of government decision-making powers (Fisman & Gatti 2002)<sup>23</sup>. In addition, Treisman (2000) claims that federal states have higher corruption issues than unitary states. Corruption occurs, as there is competition between semi-autonomous levels of the government with the power to regulate the market, and accepting bribes at high prices, and later drive private partners out of the market. Prud'homme (1995) also argues that the chance of corruption is greater at the local level compared to the national since local officials are more accessible for the establishment of unethical relationships with local interests, due to higher frequent interactions that occur at the decentralised level.

---

<sup>23</sup> The tools of corruption in the public sector include bribery, theft, and political and bureaucratic corruption (World Bank).

However, there is no clear evidence to support a positive impact of decentralisation on corruption. Empirical evidence on the relationship is mixed (Huther & Shah 1998; Treisman 2000; Fisman & Gatti 2000; Ivanyina & Shah 2011). The positive view of decentralisation that it works as an anti-corruption mechanism is viable as politicians are closer to their constituents and are more accountable for their actions. Less centralised monopoly power and accountability gains from decentralisation may reduce opportunities for corruption and weaken the power of interest groups, thereby reducing political tensions in the country and thus stimulating economic activity (Thiessen 2000; Martinez-Vazquez & McNab 2003; and Thiessen 2003).

Several studies also attempt to modify various theoretical economic growth models to show some direct relationship between fiscal decentralisation and economic growth. Davoodi and Zou (1998) use Barro's (1990) endogenous growth model with the production function consisting of private and public inputs. They group public spending into three different levels of government (federal, state and local) and derive long-run growth as a function of the tax rate and the shares of spending of these three levels of government. Though decentralisation is observed to have a direct relationship to growth, this theoretical model does not reveal whether a more decentralised country fosters faster economic growth. Samimi, Petanlar, Haddad and Alizadeh (2010) use the framework of Davoodi and Zou (1998), but group the levels of government into two (federal and provincial) instead of three to show a nonlinear relationship between fiscal decentralisation and growth. Martinez-Vazquez and McNab (2006) choose a different approach. They extend the work of Mankiw, Romer and Weil (1992) based on Solow's (1956) neoclassical growth model. They model the direct effect of fiscal decentralisation, and its secondary effect through physical inputs and macroeconomic stability, on the aggregate production function and economic growth.

Meanwhile, Brueckner (1999) fills the gap by improving Diamond's (1965) Overlapping Generation model (OLG) to explain the connection between federalism, capital accumulation and growth. The model implies the trade-off between fiscal federalism and unitary systems affects savings and growth. However, the switch to federalism does not have any influence on long-run growth except in its transitional impact on economic growth<sup>24</sup>. Later, using the OLG framework of Yakita (2003), Brueckner (2006) provides a better understanding of why decentralisation affects permanent economic growth through savings and investment in human capital.

---

<sup>24</sup> The demand differential between young and old in public good would determine the direction of the effect on the saving (Brueckner, 1999, page 208).

Nishimura (2006) applies the concept of human fallibility, of Sah and Stiglitz (1991), in the OLG setting, to model the impact of the complementarity degree between centralised and decentralised government on growth. The study finds that fiscal decentralisation leads to a lower volatility of GDP growth and is more desirable than fiscal centralisation for the promotion of economic growth. Akai, Nishimura and Sakata (2007) extend the theoretical model of Nishimura (2006), and obtain similar results to that work.

Previous studies have also developed a model to explain the importance to growth, of the competition in fiscal decentralisation. Rauscher (2007) combines a static capital allocation model with a dynamic model of accumulation of ‘technological’ knowledge to study the impact of tax competition on innovation and growth. However, the study only focuses on the public sector and neglects private capital accumulation. The model shows that tax competition through decentralisation leads to less political innovation and lower economic growth, with the assumption of constant private capital. Neglecting innovation factors, Rauscher (2005) develops a model of the effect of tax competition on economic growth, which demonstrates that increased competition for mobile factors might either enhance or decelerate growth, depending on Leviathan’s elasticity of intertemporal substitution. Based on the above discussion, both arguments regarding the impact of fiscal decentralisation on economic growth have strong points. Evidence of the benefits and detriments of fiscal decentralisation can also be observed from the previous empirical literature. Hence, the following section discusses the empirical literature on fiscal decentralisation and economic growth.

### **4.3 Empirical evidence on fiscal decentralisation and economic growth**

Recently, there has been increasing interest from researchers in examining the relationship between fiscal decentralisation and economic growth. In the pioneering study of Oates (1985), central government’s share of both total public expenditure and revenue in a subsample of 18 industrialised countries was found to be less than in a subsample of 25 developing countries<sup>25</sup>. Besides this, Bahl and Linn (1992) report local governments’ average share of public expenditure during the late 1980s to the early 1990s was higher for industrialised countries than for developing countries. Writing

---

<sup>25</sup> The average central share of total public spending among the industrialised countries was about 65 percent, compared to 89 percent for the developing nations. The central governments’ average share of public revenue in the developing countries was more than 90 percent. The data used by Oates (1985) is based on data published by the International Monetary Fund (1982).



more than 60 years ago, Martin and Lewis (1956) argue that one of the most striking features of under-developed countries is the deficiency of the local government in comparison to the central government (cited in Oates 1993). Ebel and Yilmaz (2002) acknowledge that high-income Organisation for Economic Co-operation and Development (OECD) countries tend to be more decentralised than others, as proxied by subnational shares of revenues and expenditures indicators. Though centralisation remains the highest authority in many developing countries, the growing interest from the central government in transferring their responsibilities to local governments has been realised in various forms. Given the higher degree of decentralisation in developed countries, the implication that higher decentralisation has contributed towards higher development to these countries. Various empirical studies have come forward to give a better understanding of the relationship between decentralisation and economic growth. This study reviews the previous empirical works on the potential relationship between fiscal decentralisation and economic growth in the following paragraphs.

Economists and researchers have attempted to examine the role of fiscal decentralisation on economic growth, focusing on different types of economies. Most documented are the empirical findings for the developed countries of the United States, Australia and some European countries (Bodman, Campbell, Heaton & Hodge 2009; Bodman, Heaton & Hodge 2009; Akai & Sakata 2002; Behnisch, Buettner & Stegarescu 2002; Xie, Zou & Davoodi 1999). In the context of the United States, Akai and Sakata (2002) provide evidence supporting the contribution of fiscal decentralisation to economic growth. The study analyses a sample consisting of 50 states of the United States between 1992 and 1996. It uses revenue, production (expenditure), fiscal autonomy and production-revenue (incorporating both the revenue and expenditure shares) as the indicators of fiscal decentralisation. The study discovers that all indicators except fiscal autonomy have a significant positive effect on growth in the United States. These findings are contrasting with a previous study by Xie, Zou and Davoodi (1999). The latter use an annual historical time series analysis of local spending shares in three level of governments in the United States from 1948 to 1994; and a negative but insignificant effect of spending decentralisation on annual growth. At the county level, Hammond and Tosun (2009) report that the growth influences the decentralisation that may differ between metropolitan and non-metropolitan counties, from 1970 to 2000. This is consistent with Stansel (2005) regarding the positive effect of revenue decentralisation on metropolitan growth. On the other hand, a negative influence on growth is shown in non-metropolitan counties. Though fiscal

decentralisation might have fewer benefits on the less demographically diverse non-metropolitan counties, its effect in stimulating growth at both local (metropolitan counties) and state levels in the United States is significant.

Meanwhile, Bodman, Campbell, Heaton and Hodge (2009) and Bodman, Heaton and Hodge (2009) attempt to examine the growth effect of fiscal decentralisation on the Australian economy by using different methodological approaches. The former analyse the impact of fiscal decentralisation at both aggregate and state levels. At the aggregate level, based on data from 1972 to 2005, the study finds that only the sub-central governments' tax revenue as a share of total public-sector revenue has a negative effect, while the remaining fifteen indicators of fiscal decentralisation have no significant effect on short-term economic growth. However, the study finds seven out of sixteen measures of fiscal decentralisation that have significant effects on the medium-term growth of the Australian economy.<sup>26</sup> Negative-growth effects are observed from the expenditure and average measures of decentralisation, while positive-growth effects come from revenue, tax autonomy, the corrected measure of revenue decentralisation, sub-central non-tax revenue share, and the local government share of total public-sector expenditure. At the state level, the results of a dynamic panel model based on Generalised Method of Moments (GMM) estimation are consistent with the results of a fixed effect model for panel data that covers the period 1990 to 2006. The study shows significant negative effects on state growth of three fiscal decentralisation measures: the local share of tax revenue, sub-central governments' share of tax revenue, and the local government's share of the sub-central government's tax revenue. In summary, there are no similar findings found for the growth impact of revenue decentralisation, between the aggregate and state-level analysis. These differences in findings imply that regional and cultural-specific characteristics also play some role in the growth of Australian states. Using the same data, Bodman, Heaton and Hodge (2009) re-examine the relationship between fiscal decentralisation and growth based on the Bayesian model averaging (BMA) technique at the aggregate level of the Australian economy. Overall, the results show that all indicators of fiscal decentralisation are significant to the economic growth. As compared with the results of the former paper, the study shows consistent results for all five indicators, except for two measures: the sub-central government's share of total revenue and the corrected measure of revenue decentralisation, which has a negative

---

<sup>26</sup> The average measure of decentralisation includes both total expenditure and revenue.

impact on the economy. These mixed results imply that no conclusion can be drawn concerning the relationship between fiscal decentralisation and growth in Australia.

There are also some previous empirical studies on the growth impact of fiscal decentralisation that focused on European countries. Reviewing the experience of Germany's federal structure from 1850 to 1997, Behnisch et al. (2002) report that decentralisation through an increase in state-level government expenditure was not an efficient way to enhance productivity growth, while centralisation or an increase in the federal-level expenditure share was more significant in stimulating economic growth through an improvement in the level of productivity. On the other hand, Feld, Kirchgässner and Schaltegger (2004) examine the effect of various indicators of fiscal federalism on economic performance across 26 Swiss cantons from 1980 to 1998. The empirical analysis of the study is based on the production function approach employed by Feld and Savioz (1997) and the neoclassical growth model of Mankiw et al. (1992). In this context, fiscal federalism represents a technological factor in the production function. The study uses revenue and spending decentralisation, grants, tax competition, fragmentation, and urbanisation as the measures of federalism. The results show that only grants and tax competition are significant in affecting the economic performance of Swiss cantons, whereby there is a negative impact of matching grants but a positive impact of tax competition on Swiss economic performance. The study claims that the negative growth effect of grants might be the result of the Swiss fiscal equalisation system or a reversed impact of GDP on the matching grants. The significance of tax competition on the economic performance of Switzerland reflects the reliability of the Leviathan hypothesis of Brennan and Buchanan (1980) regarding the advantages of decentralisation for growth.

Carrion-i-Silvestre, Espasa, and Mora (2008) study the link between fiscal decentralisation and economic growth in Spain at the aggregate level during the period from 1980 to 1998 and at the regional level for a different period of 1991 to 1996. The results show that decentralisation has contributed positively to overall Spanish growth as well as regional growth. The findings lend empirical support to Esteller-Moré and Solé-Ollé (2005), who analyse the efficiency of fiscal decentralisation in Spain during the time frame of 1977 to 1998. The latter study supports the 'Decentralization Theorem' of Oates (1972), which states that sub-central governments have done a better job than central government in responding to local needs and services among territories. This claim is based on their analysis of the response in terms of public road and educational investment, from sub-central and central governments, to the output,

number of users, environmental cost factors and political hazards of each region. The results, showing more responsive sub-central than central government in these matters, provide evidence that the former is more efficient than the latter. In more recent work, Cantarero & Gonzalez (2009) find a significant positive effect of revenue and expenditure decentralisation on economic growth, based on an analysis across 17 regions in Spain and more recent data from 1985 to 2004. The results of all three studies suggest that fiscal decentralisation has been crucial in promoting economic growth in the case of Spain.

As for the Asian region, Kim (2006) attempts to examine the relationship between local decentralisation and economic growth in South Korea by comparing results for two levels of local government, municipal and provincial, for the years 1999 to 2003. Three measures of decentralisation (tax-benefit ratio, local expenditure ratio and local autonomy) are used in the study. At both levels of local government, the study finds a positive effect of the local expenditure ratio on regional economic growth. However, local autonomy is insignificant in promoting growth at either the provincial or municipal level. More interestingly, the tax-benefit ratio is found to cause growth expansion in the municipalities but not for the larger size of government at the provincial level. The experience of South Korea in using decentralisation to stimulate economic growth could provide lessons for other middle-income countries, such as Malaysia<sup>27</sup>.

The empirical works on fiscal decentralisation and growth have also started to attract attention from researchers on developing countries. Empirical evidence based on a single developing country analysis can be found for Russia, Iran and some Asian countries including China, India, Pakistan, Nepal and Indonesia.

Recently, Yushkov (2015) has examined the relationship between fiscal decentralisation and economic growth in 78 Russian regions during the period of 2005 to 2012. The study adopts the model by Davoodi and Zou (1998). It shows a negative relationship between expenditure decentralisation and economic growth but a positive association between federal transfers and growth. This result implies that Russian local government has excessive expenditure decentralisation, which has negatively affected regional growth. Given insufficient revenues of their own, the local authorities in Russia

---

<sup>27</sup> Based on Figure 1.1 in Chapter 1, Malaysia and South Korea experienced similar levels of per capita GDP from the starting year 1985 onwards. Since then, Malaysian GDP per capita has lagged behind that of South Korea. South Korea is among the Asian countries that have made the transition from middle to high-income status.

are unable to spend the budget efficiently. However, federal transfers are significant to reduce excessive expenditure decentralisation and reduce the regional financial burden, which is conducive to growth. Earlier, Desai, Freinkman and Goldberg (2005) revealed a positive effect of fiscal autonomy on the economic growth of 80 Russian regions, covering the period of 1996 to 1999. Their study uses tax retention as a measure of fiscal autonomy. The results, based on both single equation and simultaneous equation models, report a positive effect of tax retention on growth. In this context, a higher tax retention rate in a region could provide incentives for private business and promote greater regional reform and investment. The findings of Yushkov (2015) and Desai et al. (2005) imply that benefits of fiscal decentralisation for economic growth in the Russian Federation have been realised in the case of revenue decentralisation but not in the case of expenditure decentralisation.

Several studies have focused on fiscal decentralisation and growth in China (Zhang and Zou, 1998; Lin and Liu, 2000; Jin and Zou, 2005; Ding, 2007 and Chu and Zheng, 2013). Zhang and Zou (1998) analyse panel data for 28 provinces of China between 1980 and 1992 and find that spending decentralisation has a negative influence on provincial economic growth. In a more up-to-date analysis, Lin and Liu (2000) control for the effects of other reforms of the Household Responsibility System and use the marginal retention rate of revenue as a decentralisation indicator that covers 28 provinces in China for the period from 1970 to 1993. Their study finds that fiscal decentralisation measured by the marginal retention rate of revenue does promote economic growth through efficiency. It is found that with fiscal decentralisation, a bigger portion of revenue of the local governments revenues goes to high-productivity areas. Meanwhile, Jin and Zou (2005) compare the fiscal reforms of 30 provinces in China during two phases, relating to the fiscal contract system (1979–1993) and the tax assignment system (1994–1999). In the first phase, the study shows results consistent with the previous findings of Zhang and Zou (1998) and Lin and Liu (2000), with a negative impact of expenditure decentralisation and a positive influence of revenue decentralisation on economic growth. In contrast, a significant growth effect of expenditure decentralisation was not identified, but a negative significant impact of revenue decentralisation on economic growth during the phase of the tax arrangement system. Although China experienced more centralisation in collecting revenue from the year 1994 onwards, the results show that the coefficient of central transfer was not significant. The reason is that a ‘tax refund’ introduced by the central government was

used to compromise some provinces, which had obtained lower revenue of their own during the period before the tax reform.

Ding (2007) also attempts to examine the effects of fiscal reforms on growth in China. The study involves a sample of 30 provinces during a longer period, from 1994 to 2002. Interestingly, it finds both expenditure and revenue decentralisation important to the promotion of economic growth. This finding is contradicted by Jin and Zou (2005), who support the role of centralisation following the fiscal reforms in China. Furthermore, the findings present different effects of fiscal decentralisation on economic growth in the three regional areas of Eastern, Central and Western China. Economic growth is positively affected by expenditure decentralisation in all three areas, but revenue decentralisation positively affects economic growth only in the Central area. Based on a sample of 31 Chinese provinces during 1996 to 2005, Chu and Zheng (2013) use a two-stage least squares estimation technique to analyse the significance of fiscal decentralisation to economic growth. The findings support significant indirect effects of fiscal decentralisation on economic growth, through physical capital stock, the labour force and human capital. It is found that local governments' expenditures on physical infrastructure and education in China rely on local tax rates and the degree of fiscal decentralisation. These expenditures would in turn influence the levels of local physical capital stocks and human capital, respectively, thereby affecting economic growth.

For the case of India, Mohanty and Patra (2017) evaluate panel data on seventeen subnational governments for the 2000-2001 and 2014-2015 periods, using a vector autoregression framework. The study proposes a measure of fiscal decentralisation based on the geometric mean of the measures of fiscal autonomy and the fiscal importance index. The impulse response function shows that a positive shock in fiscal decentralisation has increased economic growth in the subnational governments, with a reverse effect also noticed. The growth impact of fiscal decentralisation has also been compared between India and China (Zhang & Zou 2001 and Martinez-Vazquez & Rider 2006). Zhang and Zou (2001) analyse the impact of fiscal decentralisation and various types of expenditure (administration, development, defence, urban maintenance and human capital) on growth in 29 provinces of China, over the period 1987 to 1993. Meanwhile, for India, the study uses development, non-development, social services, administration, economic services, health, and education expenditure, and two measures of decentralisation (expenditure and revenue) to study the growth impact of decentralisation on the sixteen major states in India from 1970 to

1994. The study claims that the use of revenue to measure fiscal decentralisation in China is inappropriate as the central government levies most tax revenues. The results indicate that fiscal decentralisation does promote economic growth in India but it is damaged in China. This is shown by the negative and significant effect of provincial spending on administration, and the insignificant effect of other provincial spending, on growth in China. The results also reveal a significant positive influence of central spending on growth. In the case of India, the study argues that an increase in the central share of spending in the areas of development, non-development and social services, accompanied by a reduction in central spending on all other areas (administration, economic services, health and education) could enhance the economic growth of the states. The estimated coefficients of both revenue and expenditure decentralisation indicate positive and statistically significant values.

Meanwhile, Martinez-Vazquez and Rider (2006) compare the institutional setups of fiscal decentralisation in the two countries and observe the features of the two decentralisation systems that may have an impact on economic growth. There are a few similar issues in the fiscal systems of the two countries in terms of unclear expenditure assignments, a high dependency on intergovernmental transfers, low revenue autonomy, and soft budget constraints. However, India seems to have better accountability than China, as there is a lack of democratic elections in China, with local officials appointed by the central authority. Consequently, instead of looking at the preferences and needs of local residents, these local officials are more likely to make decisions biased on favour of their superiors in the government hierarchy so that they will be promoted. This fact may constrain the efficiency of decentralisation and could be an explanation for the negative growth impact of decentralisation in China found by the previous studies of Zhang and Zou (1998, 2001), and Jin and Zou (2005). Though India has a more democratic element at the local level, the local officials are constrained by their lack of power to control their own budgets, since the states have the final say on all expenditure and revenue decisions at the local level.

Malik, Hassan and Hussain (2006) concentrate on Pakistan, aiming to understand the impact of fiscal decentralisation on its growth. The analysis involves all four regions during the period 1971 to 2005. The study uses a first difference operator and a first moving average process. It provides evidence that fiscal decentralisation is important to the acceleration of economic growth, based on positive and significant estimates of the coefficients of the revenue decentralisation measures. Though the estimates of the coefficients of expenditure decentralisation, however, are also positive,

their values are not statistically significant. This result is supported by a later study by Iqbal, Din and Ghani (2012), which applies the GMM and covers the period 1972 to 2010. That study reports a positive and significant impact of revenue decentralisation on growth in Pakistan. On the other hand, expenditure decentralisation is found to adversely affect the growth of provinces in Pakistan.

In Nepal, though the process of decentralisation began in the early 1960s, a more operational form of decentralisation was only realised after the enactment of the Local Self Governance Act (LSGA) in 1999 (Devkota, 2014). The LSGA was adopted to replace separate acts that were previously enacted for the village, municipality and district levels, incorporating some of their provisions. Under the LSGA, the local bodies gained greater political, administrative and financial power, as well as more authority to manage the development of local affairs. Devkota (2014) tests the impact of the LSGA's enactment and both expenditure and revenue decentralisation on the growth of 75 districts, for the period from 1996 to 2001. The findings are consistent with the growth theory of fiscal decentralisation, as all three fiscal decentralisation indicators (LSGA, expenditure and revenue) show a significant positive effect on economic growth. The results imply that fiscal decentralisation does matter to the economic growth of Nepal. Similarly, Samimi et al. (2010) show support for fiscal decentralisation having a positive effect on economic growth in the case of 30 provinces in Iran. However, their study reveals that the relationship is nonlinear over the period from 2001 to 2007.

Jumadi, Pudiharjo, Maski and Khusaini (2013) study the growth impact of fiscal decentralisation in East Java in Indonesia. The study analyses panel data for 29 districts and nine cities during the period from 2007 to 2010. It uses structural equation modelling to investigate both the direct and indirect impacts of fiscal decentralisation on growth. The results do not support any direct influence of fiscal decentralisation on growth. However, the fiscal decentralisation has accelerated economic growth through its impact on the quality of human development and infrastructure in East Java. Fadli (2014) attempts to study the impact of fiscal decentralisation on regional growth in Eastern and Western Indonesia based on several balanced funds, namely the General Allocation Fund (DAU), the Special Allocation Fund (DAK), the Revenue Sharing Fund (DBH) and local revenue (PAD). The findings indicate that fiscal decentralisation through an increase in the DAU and PAD balanced funds would promote the economic growth of Eastern Indonesia; while an increase in the DBH and PAD balanced funds would stimulate the economic growth of Western Indonesia. Digdowiseiso (2016)



examines whether the growth rate in Indonesia is cointegrated with its explanatory variables, which include governance and fiscal decentralisation. The study conducts national-level analysis for the period 1984 to 2014. It finds a cointegrating relation among the growth rate and the following variables: quality of governance, level of fiscal decentralisation (expenditure indicator), investment, human capital, trade, population growth and initial level of GDP per capita. Based on a vector error correction model, the study shows that governance and the level of fiscal decentralisation have a significant positive effect on economic growth. Besides this, the Granger causality test implies that there is unilateral causality between fiscal decentralisation and growth and quality of governance. The significant coefficient of the interactive term (between governance and fiscal decentralisation) suggests that good governance along with better operation of fiscal decentralisation will improve economic growth over the long run.

In cross-country analyses, some studies have focused on the impact of fiscal decentralisation on economic growth in OECD countries. Thiessen (2003) analyses the relationship between fiscal decentralisation and the components of growth, namely per capita economic growth, capital formation and total factor productivity. The study involves all high-income countries, and focuses on cross-sectional analyses using the average of annual data over the period from 1973 to 1998. Interestingly, the results show a hump-shaped impact of fiscal decentralisation on growth. At a low degree of fiscal decentralisation (either expenditure decentralisation or simple average of subnational share of both total consolidated expenditure and total consolidated revenue), an increase in the degree of decentralisation may encourage growth. Past a certain point, though, any further rise in the degree of fiscal decentralisation could hinder economic growth, productivity and the investment ratio. On the other hand, Thornton (2007) includes 19 high-income OECD countries and uses average data from 1980 to 2000 to study the cross-sectional association between fiscal decentralisation and growth. The sample includes all high-income countries except Mexico. The study finds contradictory result that revenue decentralisation based on subnational own-sourced revenue is not a significant factor in economic growth.

Baskaran and Feld (2013) evaluate the effect of fiscal decentralisation on the economic growth of 23 high-income OECD countries during the period from 1975 to 2008 by comparing two proxies of fiscal decentralisation, the traditional measure of Government Finance Statistics and a new measure that considers the degree of subnational tax autonomy. Based on fixed effect analysis, the study finds a negative but insignificant impact of the degree of fiscal decentralisation based on the traditional

measure, while the new measure of subnational tax autonomy indicates a statistically significant negative impact on growth. Gemmell, Kneller and Sanz (2013) use the different, pooled-mean group techniques to analyse the impact of fiscal decentralisation on the growth of 23 high-income OECD countries over the period of 1972 to 2005. The findings indicate that expenditure decentralisation tends to deteriorate economic growth, while revenue decentralisation is significant in promoting economic growth. The findings of Baskaran and Feld (2013) and Gimmell, Kneller and Sanz (2013) are inconsistent with those of Thiessen (2003) for the high-income OECD countries.

Davoodi and Zou (1998) also examine the association between fiscal decentralisation and economic growth based on the cross-country perspective. They compare results for 19 developed and 27 developing countries, from 1970 to 1989. They find no significant effect of fiscal decentralisation (measured by expenditure) on the growth of developed countries but a significantly negative growth impact for the developing countries. When the two subsamples are combined, the study again finds a negative effect of fiscal decentralisation on economic growth. In the case of developing countries, this finding challenges the result of Woller and Phillips (1998), who report no significant association between fiscal decentralisation and economic growth rates, across a sample of 23 less developed countries from 1974 to 1991. According to Davoodi and Zou (1998), there are some possible explanations for a negative effect of fiscal decentralisation on economic growth in developing countries. First, the composition of government spending may influence growth. The conventional belief is that there are positive effects from capital and infrastructure spending but adverse effects from current spending on growth. In this study, the measurement of decentralisation based on total subnational expenditure does not distinguish between the different types of expenditure. The negative growth effects of decentralisation may be the result of excessive spending on the wrong expenditure items. However, concerning the composition of expenditure, the earlier results by Devarajan, Swaroop and Zou (1996), using a sample of 43 developing countries over 20 years from 1970 to 1990, challenge the conventional wisdom. That study reports a positive effect of an increase in the current share of expenditure but a negative effect of capital expenditure on economic growth. This result suggests that an excessive use of capital expenditure in developing countries has resulted in an unproductive outcome. Hence, developing countries must reallocate public expenditure between capital and current expenditure to promote better productivity in the public sector.

Second, mistakes when assigning revenue responsibilities among the various levels of government could explain the significant negative effect of fiscal decentralisation on growth. Third, fiscal decentralisation in developing countries might be constrained by central government decisions, which have limited the local government's ability to obtain efficiency gains from decentralisation. Fourth, local officials may not make decisions based on the preferences and needs of the local jurisdiction. This will often happen if the local citizens are poor and do not have the power to vote for elected officials. More recently than the above works, Tarigan (2003) has filled the gap of study by analysing a pooled data set of 34 countries comprising developed and developing countries during the period from 1979 to 1999. The study reveals that fiscal decentralisation as measured by subnational expenditure share is insignificant in affecting economic growth, although a negative relationship was found. This result lends empirical support to Woller and Phillips (1998), who focus on the less developed countries but contradicts with Davoodi and Zou (1998) who used a sample of developed and developing countries.

Based on a national-level analysis, Rodríguez-Pose and Krøijer (2009) study the same relationship across panel data for sixteen Central and Eastern European countries, over the period from 1990 to 2004. All the countries except one saw subnational taxes make up more than a 30% share of total subnational revenue. The findings show that expenditure at subnational tiers of government and intergovernmental transfers are negatively correlated with economic growth. Meanwhile, the share of subnational taxes is positively associated with the national growth rate. The findings support the view that revenue decentralisation has promoted greater economic efficiency in the subnational governments of Central and Eastern European countries. Overall, the empirical studies on the relationship between fiscal decentralisation and economic growth have reported mixed results. Furthermore, to the best of the author's knowledge, no previous work has focused on the Malaysian perspective. The next subsection discusses the data and methodology that have been used in this study.

## **4.4 Methodology**

### **4.4.1 Data, variables and sources of data**

The study chooses per capita GDP as an indicator of economic growth. Following previous empirical studies, the study uses the subnational (state and local) and federal governments' shares of both total public-sector revenue and development expenditure,

to measure the degree of fiscal decentralisation in the country. Other economic indicators involved are the labour force and net exports. The data used in the study are obtained from various sources. The data for GDP, total population, exports and imports are acquired from the Economic Planning Unit Prime Minister's Department, while the data on subnational (state and local) and federal governments' total revenue and development expenditure are obtained from the yearly Economic Report published by the Ministry of Finance. Data on the labour force are retrieved from the World Bank database. In this study, the data are annual time series from 1985 to 2015. The variables of government revenue and spending are deflated using the consumer price index of 2010 as the base year to obtain their values in real price terms. GDP is also deflated to constant 2010 prices.

#### 4.4.2 Model and specifications

The study adopts Davoodi and Zou's (1998) and Barro's (1990) frameworks to explain the relationship between fiscal decentralisation and economic growth. Barro (1990) incorporates the public sector,  $g$ , as an input into the production function, together with private capital  $k$ . Private inputs  $k$ , and public inputs  $g$ , are not close substitutes, whereby the inclusion of  $g$  in the production function is justified. Within Barro's (1990) model, Davoodi and Zou (1998) assume that  $g$  is divided into three levels of spending, federal, state and local. A higher share of spending in the subnational government (state and local) will imply a higher degree of fiscal decentralisation. Following Davoodi and Zou's (1998) framework, the regression model estimated in this study is as follows:

$$\ln GDP_t = \alpha_0 + \alpha_1 Decentralization_t + \sum \beta_i X_{i,t} + \varepsilon_t \quad (1)$$

where  $\ln GDP$  is the log per capita real GDP, as the proxy for economic growth, and  $X$  represents a vector of other explanatory variables in the regression.  $\varepsilon$  is the statistical error term while the subscript  $t$  denotes time in yearly basis. The study includes the three levels of government (federal, state and local)'s shares of total public sector revenue and development expenditure, as measures of fiscal decentralisation. In this regard, the study divides the analysis into two cases: revenue and expenditure decentralisation. Vector  $X$  consists of the control variables of labour force ( $\ln$  Labour),

measured by log of the size of the labour force, and net exports (Nexp), measured by the ratio of total net exports to GDP. Labour is included to examine the relationship between labour and output, as described in the neoclassical growth model. Net exports are included to examine the export-led growth theory in the Malaysian context. The theory argues that expansion of exports may attract greater investment, hence promoting better productivity and greater output (Beckerman, 1962). In this regard, the specify estimated regression equations as follows:

1) Revenue decentralisation :

$$\ln GDP_t = \alpha_0 + \alpha_1 FedRev_t + \alpha_2 StateRev_t + \alpha_3 LocRev_t + \beta_1 \ln Labour_t + Nexp_t + \varepsilon_t$$

2) Expenditure decentralisation :

$$\ln GDP_t = \alpha_0 + \alpha_1 FedSpend_t + \alpha_2 StateSpend_t + \alpha_3 LocSpend_t + \beta_1 \ln Labour_t + Nexp_t + \varepsilon_t$$

where FedRev, StateRev and LocRev refer to the federal, state and local government's share of total public-sector revenue, and FedSpend, StateSpend and LocSpend represent the federal, state and local government's share of total public-sector development expenditure, respectively.

Based on the nature of the data, the study adopts an Autoregressive Distributive Lag (ARDL) model in examining the effect of fiscal decentralisation on Malaysian economic growth. The ARDL framework is applicable as the variables included in this study are mixed of I(0) and I(1). In this context, it is useful for examining the long-run relationship between the fiscal decentralisation indicators (FedRev, StateRev, LocRev/ FedSpend, StateSpend, LocSpend), labour force (ln Labour) and net exports (Nexp), and economic growth (ln GDP). The empirical analysis in the study involves several steps. First, the study overviews the data of each variable and tests for the presence of unit roots in the series. The study chooses the ARDL model as the most fitting regression estimation framework. Next, the study selects the best ARDL model based on lag selection criteria followed by long-run and bound cointegration tests. Later, the

study applies diagnostic tests that include normality, autocorrelation and stability tests. In this study, the cointegration regression of the ARDL model is as follows<sup>28</sup>:

$$\begin{aligned} \Delta \ln GDP_t = & \alpha_0 + \alpha_1 \ln GDP_{t-1} + \alpha_2 FedRev_{t-1} + \alpha_3 StateRev_{t-1} \\ & + \alpha_4 LocRev_{t-1} + \beta_1 \ln Labour_{t-1} + \beta_2 Nexp_{t-1} \\ & + \sum_{i=1}^n \alpha_{GDP} \Delta \ln GDP_{t-i} + \sum_{j=1}^p \alpha_{FedRev} \Delta FedRev_{t-i} \\ & + \sum_{j=1}^p \alpha_{StateRev} \Delta StateRev_{t-i} + \sum_{i=1}^p \alpha_{LocRev} \Delta LocRev_{t-1} \\ & + \sum_{k=1}^q \beta_{\ln Labour} \Delta \ln Labour_{t-i} + \sum_{k=1}^q \beta_{Nexp} \Delta Nexp_{t-i} + \mu_t \end{aligned}$$

#### 4.5 Findings and discussion

Table 4.1 reports descriptive statistics on all the variables of the study. Based on the Jarque-Bera test, all the variables except for the federal revenue as a share of total public-sector revenue are normally distributed. The standard deviation also indicates that the dispersion of each variable from its mean is small, with the highest value about 0.31, for  $\ln GDP$ . The statistics display that the local government's shares of both total public revenue and of spending are about the same in Malaysia, at an average value of 3 percent. The mean values of the federal shares of both total public revenue and spending are above 70 percent from 1985 to 2015. Meanwhile, the state governments' share of total public sector revenue and spending is nearly 10 percent. These statistics reveal that there is a low degree of fiscal decentralisation in Malaysia, and that the federal government has been the major participant in the public sector of the economy.

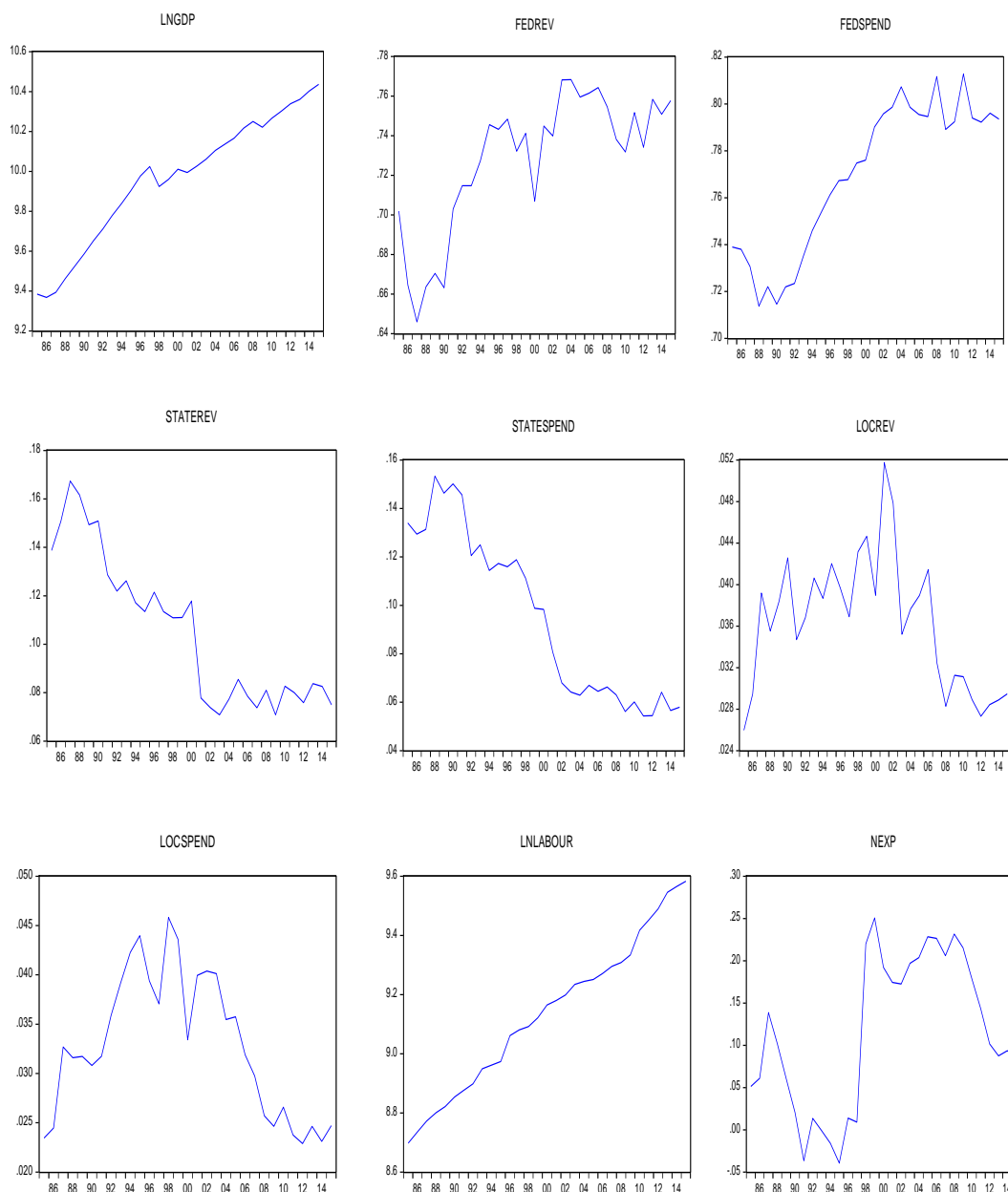
---

<sup>28</sup> FedRev, StateRev, LocRev in the ARDL model are replaced with FedSpend, StateSpend and LocSpend respectively in order to examine the impact of expenditure decentralisation on economic growth.

**Table 4.1: Descriptive statistics of variables**

Variables	Ln GDP	Ln Labour	Nexp	Fed-Rev	State-Rev	Loc-Rev	Fed-Spend	State-Spend	Loc-Spend
Mean	9.9606	9.1365	0.1156	0.7281	0.1055	0.0363	0.7693	0.0952	0.0328
Median	10.0109	9.1649	0.102	0.7398	0.1109	0.0369	0.776	0.0983	0.0319
Maximum	10.4365	9.5831	0.2505	0.7683	0.1674	0.0517	0.8128	0.1534	0.0458
Minimum	9.368	8.6979	-0.0393	0.6459	0.0708	0.026	0.7137	0.0544	0.0229
Std. Dev.	0.3196	0.259	0.0912	0.0349	0.0304	0.0064	0.0321	0.0345	0.0071
Skewness	-0.4534	0.0402	-0.1778	-0.9741	0.5036	0.2781	-0.4196	0.2354	0.1301
Kurtosis	2.1353	1.9691	1.6643	2.8194	1.9561	2.4861	1.7123	1.502	1.7805
Jarque-Bera	2.028	1.3812	2.4676	4.9451	2.718	0.7405	3.0516	3.1849	2.0083
Probability	0.3628	0.5013	0.2911	0.0844	0.2569	0.6906	0.2174	0.2034	0.3663

Next, the study overviews the data of each variable as shown in Figure 4.3. Each graph except LocRev, LocSpend and Nexp exhibits some trend from 1985 to 2015. Even though there is no specific method to select an appropriate model to fit the data, based on the nature of the data in general, it would have better fit when a trend term is included.



**Figure 4.3: Data of variables from 1985 to 2015**

The study proceeds with the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests with trend and intercept for the unit root analysis and the results are presented in Table 4.2. Both tests imply the presence of a unit root in the level series for all variables except for the variable LocRev for which the level series is stationary at the 10% significance level. The unit root tests indicate that the other variables are stationary at  $I(1)$ . The mix of  $I(0)$  and  $I(1)$  series satisfies the condition for ARDL bounds testing of cointegration to be appropriate, and so it is chosen in this study. This means that the ARDL bounds testing is sufficient to examine the long-run relationship between economic growth (ln GDP) and the fiscal decentralisation indicators (FedRev, StateRev,



LocRev/ FedSpend, StateSpend, LocSpend) as well as the labour force (lnLabour) and net exports (Nexp) in Malaysia.

**Table 4.2: Unit root tests (trend and intercept)**

Variables	ADF test statistic		PP test statistic	
	Level	1st Diff	Level	1st Diff
ln GDP	-1.4981	-5.0871***	-1.5273	-5.0089***
ln Labour	-3.1998	-5.4549***	-2.3073	-5.4722***
Net Export (Nexp)	-1.4818	-4.7200***	-1.4818	-4.6780***
Federal government's share of total government revenue (FedRev)	-2.4219	-7.2603***	-2.6439	-7.5213***
Federal government's share of total government spending (FedSpend)	-0.9790	-4.2136***	-1.9783	-6.1882***
Revenue Decentralisation Indicators: -				
State government's share of total government revenue (StateRev)	-2.3453	-5.8386***	-2.4693	-6.0699***
Local government's share of total government revenue (LocRev)	-3.2312*	-7.4539***	-3.1728*	-7.9418***
Expenditure Decentralisation Indicators: -				
State government's share of total government spending (StateSpend)	-2.0347	-5.6165***	-2.2481	-5.6118***
Local government's share of total government spending (LocSpend)	-2.3065	-5.9646***	-2.2539	-6.6459***

Notes: \*\*\*, \*\* and \* denote significance at the 1, 5 and 10% levels respectively

Next, the study performs lag selection based on the Akaike Information Criteria (AIC). The best model is selected based on the lowest AIC value. Figures 4.4 and 4.5 present the top 20 ARDL models for revenue and expenditure decentralisation respectively. At the lowest AIC value of -7.0768, ARDL (4, 2, 2, 1, 3, 3) was chosen as the best model for the case of revenue decentralisation. Meanwhile, ARDL (2, 1, 1, 2, 0, 1) was found to be the best model for expenditure decentralisation, with an AIC value of -5.6186. The numbers in brackets represent economic growth (ln GDP), the relevant fiscal decentralisation indicators (either FedRev, StateRev and LocRev or FedSpend, StateSpend and LocSpend), labour force (ln Labour) and net exports (Nexp).

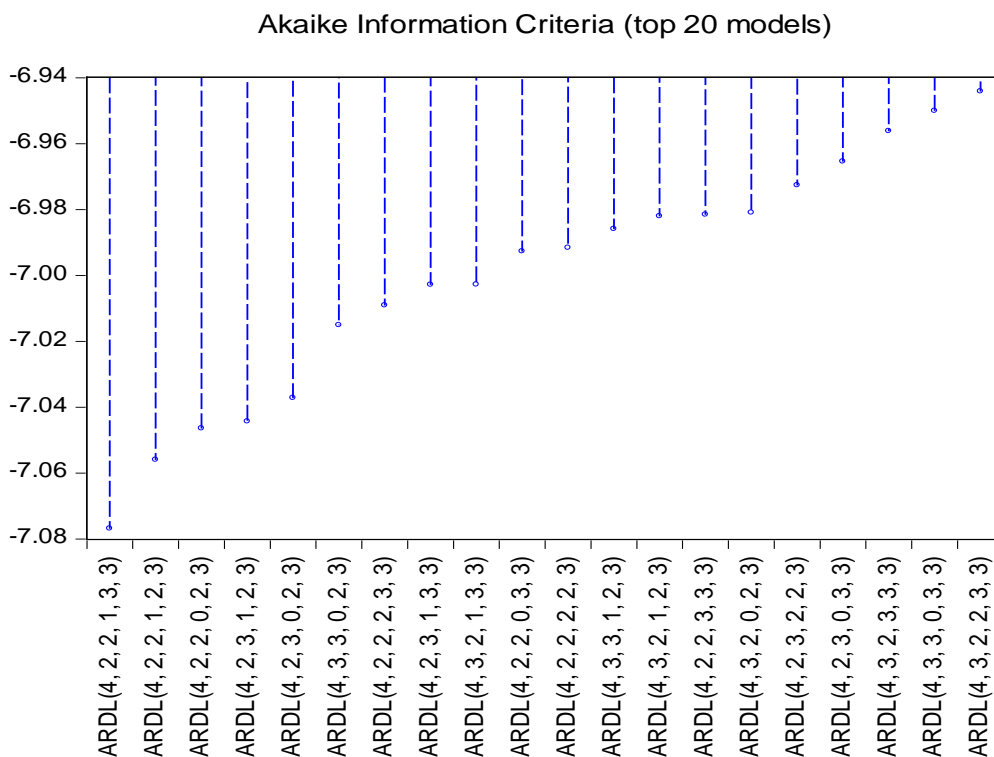


Figure 4.4: Lag selection model: revenue decentralisation

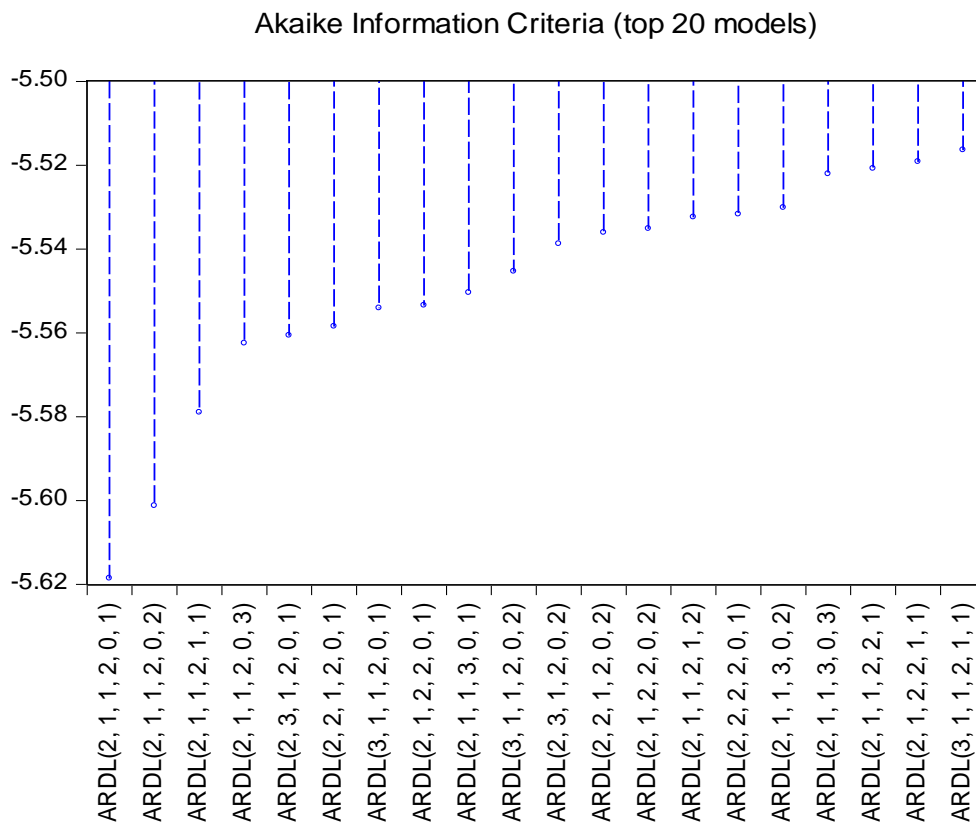


Figure 4.5: Lag selection model: expenditure decentralisation

Next, the study examines the relationship between the variables in levels based on the bounds testing of the cointegration. The statistical procedure is to compare the computed Wald or F-statistic with Pesaran, Shin and Smith's (2001) critical bounds. The null hypothesis of no relationship between the levels of the dependent variable and the regressors is rejected if the F-statistic falls above the upper bound, while the reverse conclusion is made if the F-statistic is below the lower bound. However, the test will be inconclusive if the F-statistic falls within the bounds. Table 4.3 reveals the results of the bounds test, showing that the null hypothesis of no relationship in the levels of the variables is rejected, in both the revenue and the expenditure decentralisation case. With a calculated F-statistic of 9.7291, greater than the upper bound, the result implies there is cointegration among GDP, revenue decentralisation, labour and net exports at a 1% significance value. A similar implication can be made about the relationship between GDP and the other variables in the expenditure decentralisation case, with an estimated F-statistic of 8.5564. These results suggest a long-run relationship between the variables involved in the study.

**Table 4.3: Bounds testing: ARDL F-bounds test (unrestricted constant and restrictive trend)**

Revenue decentralisation			Expenditure decentralisation		
Variables	F-statistic	Cointegration/No cointegration	Variables	F-statistic	Cointegration/No cointegration
F (FedRed, StateRev, LocRev, lnLabour, Nexp)	9.7291	Cointegration	F (FedSpend, StateSpend, LocSpend, lnLabour, Nexp)	8.5564	Cointegration
Critical Value		I (0) lower bound		I (1) upper bound	
1%		3.50		4.63	
2.50%		3.11		4.13	
5%		2.81		3.76	
10%		2.49		3.38	

Tables 4.4 and 4.5 confirm the long-run relationship between economic growth and the other regressors. It is found that both fiscal decentralisation indicators of revenue and expenditure are important factors of economic growth in Malaysia. Based on Table 4.4, revenue decentralisation at the state level has a significant positive impact on Malaysian GDP, where a one-unit increase in the state's revenue as a share of total public-sector revenue would result in an approximately 0.0312 unit increase in

economic growth. However, looking at decentralised revenue at the local level seems to suggest a different result. An increase of one-unit in the local revenue as a share of total public-sector revenue would have insignificant impact on the growth in the economy. These results suggest that an increase in the state government's power to increase revenue would favour economic growth but further decentralising revenue-raising powers to a lower level of local government would seem to be ineffective in supporting the growth of the Malaysian economy. On the other hand, the opposite results were found in the case of expenditure decentralisation. Table 4.5 shows that decentralised expenditure at the state level is insignificant to affect economic growth, but decentralised expenditure at a lower level of local government assists economic growth. Statistically, a one-unit increase in the degree of decentralisation of public expenditure at the local government level would increase economic growth by a magnitude of 0.084 units. Although the result is insignificant, the negative sign of StateSpend's coefficient indicates that an increase in the degree of decentralisation of public expenditure at the state level by one unit would dampen economic growth. These results imply that shifting more responsibility for development expenditure to local government but not state government is crucial in promoting economic growth in Malaysia.

**Table 4.4: Long-run relationships and error correction term (ECM): revenue decentralisation**

Variable	Coefficient	Std. Error	t-statistic
FedRev	0.0509***	0.0058	8.7183
StateRev	0.0312***	0.0059	5.1939
LocRev	-0.0049	0.0181	-0.2683
ln Labour	-0.4314	0.3329	-1.2958
Nexp	-0.0059**	0.0019	-3.2042
Trend	0.0381**	0.0119	3.1821
ECM <sub>t-1</sub>	-0.7826***	0.0639	-12.2405

Notes: \*\*\*, \*\* and \* denote significance at the 1, 5 and 10% levels respectively

**Table 4.5: Long-run relationships and error correction term (ECM): expenditure decentralisation**

Variable	Coefficient	Std. Error	t-statistic
FedSpend	-0.0368	0.0255	-1.4458
StateSpend	-0.0500	0.0303	-1.6538
LocSpend	0.0840***	0.0208	4.0419
ln Labour	-0.7168*	0.3628	-1.9757
Nexp	-0.0126**	0.0033	-3.8126
Trend	0.0497***	0.0123	4.0338
ECM <sub>t-1</sub>	-0.3291***	0.0359	-9.1571

Notes: \*\*\*, \*\* and \* denote significance at the 1, 5 and 10% levels respectively

The contribution of the federal government to economic growth is undeniable. This study shows that participation of the federal government in the public sector has a positive effect on economic growth, the impact of which is seen in the revenue decentralisation case. The larger coefficient for federal compared to state government participation does not imply that the position of state governments in fiscal policy should be negligible. In other words, an increase in federal government power to raise revenue should not be accompanied by a decrease in the power of state governments to collect their own revenue. Evidence to support this in the Malaysian case can be seen in Figures 4.1 and 4.2. While there was an increase in federal and statutory bodies' revenue share, the state revenue share of total public sector revenue declined in the 2000s compared to the 1990s. At the same time, the growth rate in the Malaysian economy during the 2000s was slower than in the 1990s. The findings of this study show the importance of the state governments in stimulating Malaysian economic growth. Although there is no significant growth impact from the federal government as shown in the expenditure analyses, the negative coefficient supports the irrelevance of the federal government contribution in dealing with expenditure matters.

Overall, these findings lend empirical support to the view that decentralisation has a positive effect on growth, either directly or indirectly, as previously discussed in the theoretical section on decentralisation. However, the benefits of decentralisation are realised differently at different levels of government. The results indicate that revenue collection is accomplished at the higher levels of federal and state governments, but responsibility for development expenditure is accomplished at local government level, for the stimulation of economic growth in Malaysia. Despite these findings, the position of local governments in Malaysia are based on the Federal Constitution and limited by state authority. Besides this, as there have been no local government elections since the

Indonesia-Malaysia confrontation in 1964, the local councillors have been appointed by state governments. These conditions have constrained the local governments in Malaysia from pursuing their socio-economic development portfolios effectively. The idea of having local elections in Malaysia should be reconsidered in the Malaysian Constitution, so that locally elected officials can be chosen by the local population, from those who work closely with the community and are better informed about local preferences. Furthermore, though this study does not attempt to measure the optimal degree of decentralisation, it can serve as a guideline for future studies, so that excessive imbalance between the federal and subnational governments can be avoided in the context of Malaysian public finance.

As for other determinants, the study reveals a negative effect of the labour force, as measured by log labour, and a negative effect of net exports, on the economic growth of Malaysia. The result of a significant negative effect of the labour force on growth is consistent with the previous studies of Romer (1990) and Raleva (2014), but contradicts with Paudel and Perera (2009), Ramli, Hashim and Marikan (2016) and Jebran, Iqbal, Rao and Ali (2018). According to Romer (1990), given that the production of final goods labour is a better substitute for physical capital than it is for human capital, the rise in the labour force can reduce the rate of technological change under assumption that there are possibilities for a movement of human capital from research into production of final goods. This will lead to a fall in the long-run growth.

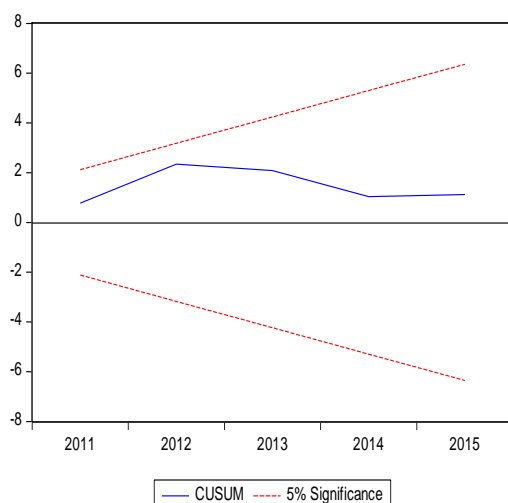
Meanwhile, the negative growth effect of net exports contradicts the export-led growth theory. This result does lend empirical support to Dodaro (1993) for the case of developing countries but is inconsistent with Hashim and Masih (2014), who find a positive growth effect of exports in the Malaysian case. The negative coefficient for net exports is explained by its driving factors. Bhagwati (1979) claims that a rise in exports due to inward foreign direct investment (FDI) would result in various distortions that could lead to a reduction in output growth (cited in Lee and Huang, 2002). Furthermore, Tan and Ariff (1999) explain three factors that may cause the insignificant contribution of exports to Malaysian economic growth. First is the adverse effect of FDI, such as the high repatriation of profits and outflows of income. Second, exports might be ineffective at promoting economic growth as there is additional growth contributed by the value-added of manufactured exports is minimum. Last but not least, high costs of insurance and freight might dampen the domestic economy, rendering ineffective exports' contribution to overall economic growth.

Based on Table 4.4 and Table 4.5, the t-statistics of the error correction term in both cases, revenue and expenditure decentralisation, are significant at 1 percent significance level. The significantly negative error correction term validates the long-run relationship between the underlying variables, the fiscal decentralisation indicators (FedRev, StateRev, LocRev/ FedSpend, StateSpend, LocSpend), the labour force (ln Labour) and net exports (Nexp), and economic growth (ln GDP). The speed of adjustment in the revenue case is higher compared to the expenditure case. The coefficients of the error term indicate that approximately 78 percent and 33 percent disequilibrium is adjusted in one year for the revenue and expenditure decentralisation cases, respectively. The diagnostic tests, as presented in Table 4.6 shows that both ARDL models have a normal distribution and are free from the problems of serial correlation and heteroscedasticity.

**Table 4.6: Diagnostic tests**

	Null hypothesis	F-statistic, J-B statistic, and P-value
<b>Breusch-Godfrey LM Test</b>		
Revenue decentralisation	No serial correlation	F-statistic: 0.9180 (0.4886)
Expenditure decentralisation	No serial correlation	F-statistic: 1.7057 (0.2199)
<b>Breusch-Pagan-Godfrey Test</b>		
Revenue decentralisation	Homoskedasticity	F-statistic: 0.9082 (0.6107)
Expenditure decentralisation	Homoskedasticity	F-statistic: 1.2379 (0.3428)
<b>Jarque-Bera Normality Test</b>		
Revenue decentralisation	Normal distribution	J-B Statistic: 0.0253 (0.79875)
Expenditure decentralisation	Normal distribution	J-B Statistic: 0.5752 (0.7501)

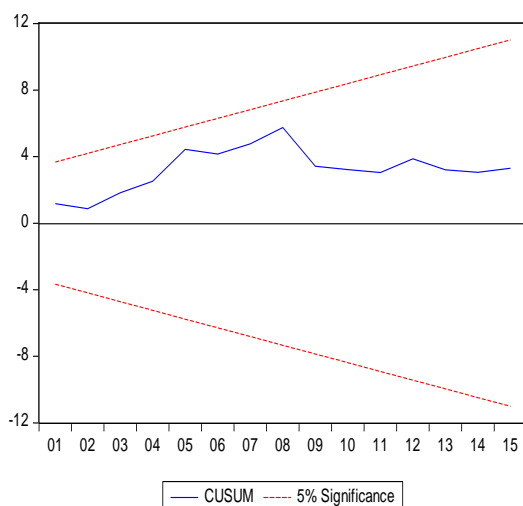
The study applies the cumulative sum (CUSUM) and cumulative sum of square (CUSUMQ) tests to check the stability of the ARDL short-run and long-run models. Figures 4.6 and 4.7 show the CUSUM and CUSUM square for revenue decentralisation while Figures 4.8 and 4.9 show the CUSUM and CUSUM square for the expenditure decentralisation case. Both tests indicate that the band lies under the 5 percent significance level, which means that the ARDL short-run and long-run models in this study are stable and fit.



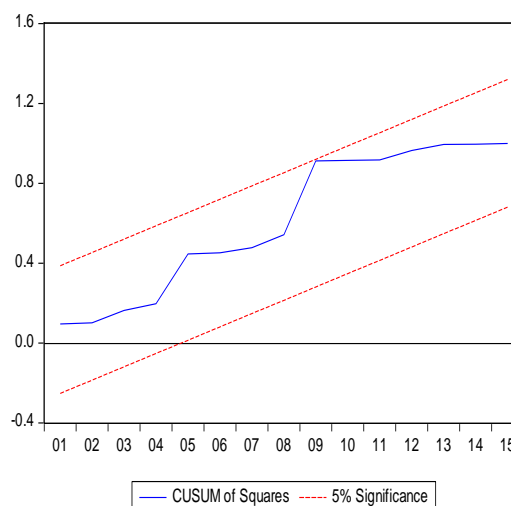
**Figure 4.6: CUSUM test (revenue)**



**Figure 4.7: CUSUMQ test (revenue)**



**Figure 4.8: CUSUM test (expenditure)**



**Figure 4.9: CUSUMQ test (expenditure)**

## 4.6 Conclusion and policy implications

This study has examined the effect of fiscal decentralisation on Malaysian economic growth during the period from 1985 to 2015. The study used the ARDL framework to examine the long-run relationship between fiscal decentralisation indicators (FedRev, StateRev, LocRev/ FedSpend, StateSpend, LocSpend), the labour force (ln Labour), and net exports (Nexp), and economic growth (ln GDP). Both revenue and expenditure decentralisation indicators were found to have a significant impact on the economic growth of Malaysia in the long run. The study finds a positive impact of revenue decentralisation at the state level. However, a further decentralisation of revenue to the local governments would have insignificant effect on growth. The study reports the



opposite results in the case of expenditure decentralisation. There is a negative insignificant impact of decentralised expenditure at the state level but a positive significant impact at the local government level. Overall, the findings of the study suggest that revenue gathering should be allocated to the higher-level authorities of federal and state governments, while responsibilities for development expenditure should be distributed to local government levels to stimulate economic growth in Malaysia.

Though the role of the federal government in the economy is highly significant, the involvement of state and local governments in socio-economic decisions should be reconsidered. As the position of state and local governments is significant, the current imbalance between federal and subnational governments' (state and local) finances is one of the issues challenging the performance of the Malaysian economy. Besides this, it is recommended that future studies quantify the optimal degree of decentralisation so that excessive imbalances between federal and subnational government finances can be avoided. The results also reveal a negative effect of the labour force and net exports on economic growth. As deterioration in net exports would enhance the economic growth of Malaysia, trade liberalisation and economic policies concerning the components of trades, whether exports or imports, should be reviewed more precisely. Lastly, this study provides some evidence on the role of institutional factors such as fiscal decentralisation in promoting the economic growth of Malaysia.

## References

Akai, N & Sakata, M 2002, 'Fiscal decentralization contributes to economic growth: evidence from state-level cross-section data for the United States', *Journal of Urban Economics*, vol. 52, no. 1, pp. 93-108.

Akai, N, Nishimura, Y & Sakata, M 2004, 'Fiscal decentralization, economic growth and economic volatility—theory and evidence from state-level cross-section data for the United State', The Centre for International Trade Studies Discussion Paper Series, no. 3.

Akai, N, Nishimura, Y & Sakata, M 2007, 'Complementarity, fiscal decentralization and economic growth', *Economics of Governance*, vol. 8, no.4, pp. 339-362.

Bahl, RW & Linn, JF 1992, *Urban public finance in developing countries*. The World Bank.

Barro, RJ 1990, 'Government spending in a simple model of endogeneous growth', *Journal of Political Economy*, vol. 98, no. 5, Part 2, S103-S125.

Baskaran, T & Feld, LP 2013, 'Fiscal decentralization and economic growth in OECD countries: Is there a relationship?', *Public Finance Review*, vol. 41, no.4, pp. 421-445.

Bhagwati, J 1979, 'International Factor Movements and National Advantage', 9th V.K. Ramawami Memorial Lecture

Behnisch, A, Buettner, T & Stegarescu, D 2002, 'Public sector centralization and productivity growth: reviewing the German experience, ZEW Discussion Paper, no. 02-03, Mannheim

Bird, RM & Vaillancourt, F (eds) 1998, *Fiscal decentralization in developing countries*, Cambridge University Press.

Bodman, P & Ford, K 2006, 'Fiscal federalism and economic growth in the OECD', MRG@ UQ discussion paper no. 7

Bodman, P, Campbell, H, Heaton, KA & Hodge, A 2009, 'Fiscal decentralisation, macroeconomic conditions and economic growth in Australia', University of Queensland, School of Economics, MRG@ UQ Discussion Paper, no. 26.

Bodman, P, Heaton, KA & Hodge, A 2009, 'Fiscal decentralisation and economic growth: a Bayesian model averaging approach', School of Economics, University of Queensland, Australia.

Brennan, G & Buchanan, J 1980, *The power to tax: Analytical foundations of a fiscal constitution*, Cambridge: Cambridge University Press.

Brueckner, JK 1999, 'Fiscal federalism and capital accumulation', *Journal of Public Economic Theory*, vol. 1, no.2, pp. 205-224.

Brueckner, JK 2006, 'Fiscal federalism and economic growth', *Journal of Public Economics*, vol. 90, no. 10, pp. 2107-2120.

Cantarero, D & Gonzalez, PP 2009, 'Fiscal decentralization and economic growth: evidence from Spanish regions', *Public Budgeting & Finance*, vol. 29, no.4, pp. 24-44.

Carrion-i-Silvestre, JL, Espasa, M & Mora, T 2008, 'Fiscal decentralization and economic growth in Spain', *Public Finance Review*, vol. 36, no. 2, pp. 194-218.

Cherif, R & Hasanov, F 2015, 'The leap of the tiger: how Malaysia can escape the middle-income trap', *International Monetary Fund Working Paper*, no. 131.

Chu, J & Zheng, XP 2013, 'China's fiscal decentralization and regional economic growth', *The Japanese Economic Review*, vol. 64, no. 4, pp. 537-549.

Dabla-Norris, E 2006, 'The challenge of fiscal decentralisation in transition countries', *Comparative Economic Studies*, Vol. 48, no. 1, pp. 100-131

Dabušinskas, A, Kulikov, D & Randveer, M. 2013, 'The impact of volatility on economic growth', *Bank of Estonia*, no. wp2012-7.

Davoodi, H & Zou, HF 1998, 'Fiscal decentralization and economic growth: a cross-country study', *Journal of Urban Economics*, vol. 43, no. 2, pp. 244-257.

Desai, RM, Freinkman, L & Goldberg, I 2005, 'Fiscal federalism in rentier regions: evidence from Russia', *Journal of Comparative Economics*, vol. 33, no. 4, pp. 814-834.

Devkota, KL 2014, 'Impact of fiscal decentralization on economic Growth in the Districts of Nepal', *International Center for Public Policy Working Paper Series*. no. 12.

Devarajan, S, Swaroop, V & Zou, HF 1996, 'The composition of public expenditure and economic growth', *Journal of Monetary Economics*, vol. 37, no. 2, pp. 313-344.

Diamond, PA 1965, 'National debt in a neoclassical growth model', *American Economic Review*, vol. 55, pp. 1125-1150

Digdowiseiso, K 2017, 'Governance, fiscal decentralization, and growth in Indonesia', *Jurnal Sosial dan Humaniora*, vol. 1, no. 1

Ding, Y 2007, 'Fiscal decentralization and economic growth in China, 1994–2002', *Journal of Chinese Economic and Business Studies*, vol. 5, no. 3, pp. 243-260.

Dodaro, S 1993, 'Exports and growth: A reconsideration of causality', *The Journal of Developing Areas*, vol. 27, no. 2, pp. 227-244.

Ebel, RD & Yilmaz, S 2002, 'On the measurement and impact of fiscal decentralization', World Bank Policy Research Working Paper, 2809: pp. 1-26

Esteller-Moré, A & Solé-Ollé, A 2005, 'Does decentralization improve the efficiency in the allocation of public investment? Evidence from Spain', Institutd' Economia de Barcelona (IEB) Working Paper. no. 2005/5

Fadli, F 2014, 'Analysis of direct and indirect effect of fiscal decentralization and regional disparity (Case study provinces in East and West Indonesia Year 2006-2012)', *Journal of Economics and Sustainable Development*, vol. 5, no. 18

Faguet, JP 2011, 'Decentralization and governance', Economic Organisation and Public Policy Discussion Papers, EOPP 027. London: London School of Economics and Political Science

Feld, LP & Savioz, MR 1997, 'Direct democracy matters for economic performance: an empirical investigation', *Kyklos*, vol. 50, no. 4, pp. 507-538.

Feld, LP, Kirchgässner, G & Schaltegger, CA 2004, 'Fiscal federalism and economic performance: evidence from Swiss cantons', *Marburger volkswirtschaftliche Beiträge*.

Fisman, R & Gatti, R 2002, 'Decentralization and corruption: evidence across countries', *Journal of Public Economics*, vol. 83, no. 3, pp. 325-345.

Flaen, A, Ghani, SE & Mishra, S 2013, 'How to avoid middle income traps? Evidence from Malaysia', Poverty Reduction and Economic Management Network, The World Bank.

Gemmell, N, Kneller, R & Sanz, I 2013, 'Fiscal decentralization and economic growth: spending versus revenue decentralization', *Economic Inquiry*, vol. 51, no. 4, pp. 1915-1931.

Hammond GW & Mehmet, ST 2009, 'The impact of local decentralization on economic growth: evidence from US countries. Discussion Paper No. 4574 IZA Germany

Hashim, K & Masih, M 2014, 'What causes economic growth in Malaysia: exports or imports?', Munich Personal RePEc Archive Paper.

Huther, J & Shah, A 1998, 'A simple measure of good governance and its application to the debate on the appropriate level of fiscal decentralization', World Bank Working Paper Series, 1894.

International Monetary Fund 1982, *Government Finance Statistics Yearbook, Vol. VI*, Washington: International Monetary Fund.

- Itoh, M 2012, 'The middle-income trap in Asia', *NIRA Policy Review*, no. 58.
- Iqbal, N, Din, MU & Ghani, E 2012, 'Fiscal decentralisation and economic growth: role of democratic institutions', *The Pakistan Development Review*, vol. 51, no. 3, pp. 173-195.
- Ivanyna, M & Shah, A 2011, 'Decentralization and corruption: new cross-country evidence', *Environment and Planning C: Government and Policy*, vol. 29, no. 2, pp. 344-362.
- Jebran, K, Iqbal, A, Rao, ZUR & Ali, A 2018, 'Effects of terms of trade on economic growth of Pakistan', *Foreign Trade Review*, vol. 53, no. 1.
- Jin, J & Zou, HF 2005, 'Fiscal decentralization, revenue and expenditure assignments, and growth in China', *Journal of Asian Economics*, vol. 16, no. 6, pp. 1047-1064.
- Jumadi, Pudjiharjo M, Maski G & Khusaini, M 2013, 'The impact of fiscal decentralization on local economic development in East Java', *IOSR Journal of Humanities and Social Science*, vol. 13, no. 1, pp. 1-7.
- Kalirajan, K & Otsuka, K 2012, 'Fiscal decentralization and development outcomes in India: an exploratory analysis', *World Development*, vol. 40, no. 8, pp. 1511-1521.
- Kim, HA 2006, 'Local decentralization and economic growth in Korea', A Research Paper, Korea Institute of Public Finance
- Lee, CH & Huang, BN 2002, 'The relationship between exports and economic growth in east Asian countries: a multivariate threshold autoregressive approach', *Journal of Economic Development*, vol. 27, no. 2, pp. 45-68.
- Lin, JY & Liu, Z 2000, 'Fiscal decentralization and economic growth in China', *Economic Development and Cultural Change*, vol. 49, no. 1, pp. 1-21.
- Lin, SC. & Kim, DH 2014, 'The link between economic growth and growth volatility', *Empirical Economics*, vol. 46, no. 1, pp. 43-63.
- Lockwood, B 2005, 'Fiscal decentralization: a political economy perspective', *Warwick Economic Research Papers*, no. 721.
- Malik, S, Mahmood-ul-Hassan & Hussain, S 2006, 'Fiscal decentralisation and economic growth in Pakistan', *The Pakistan Development Review*, vol. 45, no. 4, pp. 845-854.
- Mankiw, NG, Romer, D & Weil, DN 1992, 'A contribution to the empirics of economic growth', *The Quarterly Journal of Economics*, vol. 107, no. 2, pp. 407-437.

Martin, A & Lewis, WA 1956, 'Patterns of public revenue and expenditure', *The Manchester School*, vol. 24, no. 3, pp. 203-244.

Martinez-Vazquez, J & McNab, RM 2003, 'Fiscal decentralization and economic growth', *World development*, vol. 31, no. 9, pp. 1597-1616

Martinez-Vazquez, J & Rider, M 2006, 'Fiscal decentralization and economic growth: a comparative study of China and India', *Indian Journal of Economics & Business, Special Issue China and India*, pp. 1-18

Mohanty, A & Patra, SK 2017, 'The nexus between fiscal decentralization and economic growth: evidence from sub-national governments in India', *International Journal of Research and Innovation in Applied Science (IJRIAS)*, vol. 2, no. 1.

Nishimura, Y 2006, 'Human fallibility, complementarity, and fiscal decentralization', *Journal of Public Economic Theory*, vol. 8, no. 3, pp. 487-501.

Oates, W 1972, *Fiscal federalism*, New York Harcourt Brace Jovanovich, Inc

Oates, WE 1985, 'Searching for Leviathan: an empirical study', *The American Economic Review*, vol. 75, no. 4, pp. 748-757.

Oates, WE 1993, 'Fiscal decentralization and economic development', *National Tax Journal*, vol. 46, no. 2, pp. 237-243.

Oates, WE 2007, 'On the theory and practice of fiscal decentralization', Working Papers 0701, CREI Università degli Studi Roma Tre

OECD 2015, *The Future of Productivity*, OECD Publishing, Paris

Paudel, R & Perera, N 2009, 'Foreign debt, trade openness, labor force and economic growth: evidence from Sri Lanka', *The ICAFI Journal of Applied Economics*, vol. 8, no. 1, pp. 57-64

Pesaran, MH, Shin, Y & Smith, RJ 2001, 'Bounds testing approaches to the analysis of level relationships', *Journal of Applied Economics*, vol. 16, pp. 289 – 326 .

Porcelli, F 2009, 'Fiscal decentralisation and efficiency of government. A brief literature review', Department of Economics. University of Warwick (UK).

Prud'Homme, R 1995, 'The dangers of decentralization. *The World Bank Research Observer*, vol. 10, no. 2, pp. 201-220.

Raleva, S 2014, 'Impact of labour on economic growth in Bulgaria (1991-2013). *Economic Alternatives*, vol. 3, pp. 5-14.

Ramli, NR, Hashim, E & Marikan, DAA 2016, 'Relationship between education expenditure, capital, labor force and economic growth in Malaysia', *International*

*Journal of Academic Research in Business and Social Sciences*, vol. 6, no. 12, pp. 459-468.

Ramey, G & Ramey, VA 1995, 'Cross-country evidence on the link between volatility and growth', *American Economic Review*, vol. 85, no.5, pp. 1138–1151

Rauscher, M 2005, 'Economic growth and tax-competing Leviathans', *International Tax and Public Finance*, vol. 12, no. 4, pp. 457–474.

Rauscher, M 2007, 'Tax competition, capital mobility and innovation in the public sector', *German Economic Review*, vol. 8, no. 1, pp. 28-40.

Rodríguez-Pose, A & Gill, N 2003, 'The global trend towards devolution and its implications', *Environment and planning C: Government and Policy*, vol. 21, no, 3, pp. 333-351.

Rodriguez-Pose A & Krøijer, A 2009, 'Fiscal decentralization and economic growth in Central and Eastern Europe', *Growth and Change*, vol. 40, no. 3, pp. 387-417

Rodden, J & Wibbels, E 2002, 'Beyond the fiction of federalism: macroeconomic management in multitiered systems', *World Politics*, vol. 54, no. 4, pp. 494-531.

Romer, PM 1990, 'Capital, labor, and productivity', *Brookings papers on economic activity. Microeconomics*, pp. 337-367.

Rondinelli, DA 1981, 'Government decentralization in comparative perspective: theory and practice in developing countries', *International Review of Administrative Sciences*, vol. 47, no. 2, pp. 133-145.

Sah, RK & Stiglitz JE 1991, 'The quality of managers in centralized versus decentralized organizations', *Quarterly Journal of Economics*, vol. 106, pp. 289–295.

Samimi, AJ, Petanlar, SK, Haddad, GK & Alizadeh, M 2010, 'Fiscal decentralization and economic growth: a nonlinear model for provinces of Iran', *Iranian Economic Review*, vol. 15, no. 26, pp. 125-133.

Solow, RM 1956, 'A contribution to the theory of economic growth', *The Quarterly Journal of Economics*, vol. 70, no. 1, pp. 65-94.

Stansel, D 2005, 'Local decentralization and local economic growth: a cross-sectional examination of US metropolitan areas', *Journal of Urban Economics*, vol. 57, no. 1, pp. 55-72.

Tan, EC & Ariff, M 1999, 'External trade and economic growth: the Malaysian experience', in *International Trade Policy and the Pacific Rim*, Palgrave Macmillan, London, pp. 87-104.

Tarigan, MS, 2003, 'Fiscal decentralization and economic development: a cross-country empirical study', *Forum of International Development Studies*, vol. 24

Thiessen, U 2000, 'Fiscal federalism in Western European and selected other countries: centralization or decentralization? What is better for economic growth? (No. 224). DIW Discussion Papers.

Thiessen, U 2003, 'Fiscal decentralisation and economic growth in high-income OECD Countries', *Fiscal Studies*, vol. 24, no. 3, pp. 237-274.

Thornton, J 2007, 'Fiscal decentralization and economic growth reconsidered', *Journal of Urban Economics*, vol. 61, no. 1, pp. 64-70

Tiebout, CM 1956, 'A pure theory of local expenditures', *Journal of Political Economy*, vol. 64, no. 5, pp. 416-424.

Treisman, D 2000, 'The causes of corruption: a cross-national study', *Journal of Public Economics*, vol. 76, no. 3, pp. 399-457.

Wilson, JD 1986, 'A theory of interregional tax competition', *Journal of Urban Economics*, vol. 19, no. 3, pp. 296-315.

Woller, GM & Phillips, K 1998, 'Fiscal decentralisation and IDC economic growth: an empirical investigation', *The Journal of Development Studies*, vol. 34, no. 4, pp. 139-148.

World Bank 1990, '*Argentina: provincial government finance study*', Report 8176-AR. Washington, D.C. Processed.

Xie, D, Zou, HF & Davoodi, H 1999, 'Fiscal decentralization and economic growth in the United States', *Journal of Urban Economics*, vol. 45, no. 2, pp. 228-39

Yakita, A 2003, 'Taxation and growth with overlapping generations', *Journal of Public Economics*, vol. 87, pp. 467-487

Yushkov, A. 2015, 'Fiscal decentralization and regional economic growth: theory, empirics, and the Russian experience', *Russian Journal of Economics*, vol. 1, no. 4, pp. 404-418.

Zhang, T & Zou, HF 1998, 'Fiscal decentralization, public spending, and economic growth in China', *Journal of Public Economics*, vol. 67, no. 2, pp. 221-240.

Zhang, T & Zou, HF 2001, 'The growth impact of intersectoral and intergovernmental allocation of public expenditure: with applications to China and India', *China Economic Review*, vol. 12, no. 1, pp. 58-81.



## Chapter 5: Conclusion and implications of the study

This dissertation has some important implications for policy practice concerning Malaysian development. First, it contributes to regional development by presenting evidence of the spatial balance in socio-economic development within Malaysian states. Second, the study helps to understand the reasons on the gap between the less developed states and the developed states after many years by identifying the determinants of states' economic growth in Malaysia. Third, the study highlights the role of decentralisation of state government in fostering equitable spatial development across states through the convergence in development expenditure. Finally, this research provides a possible solution for Malaysia to escape from the middle-income trap and stagnant economic growth by providing evidence in support of the positive growth effect of decentralisation.

This dissertation consisted of three essays. In the first essay, the study examined the factors that explain variation in growth and the disparity in socio-economic development across states in Malaysia. The study adopted the three-stage least squares (3SLS) estimation method in analysing the objectives of the study. Even though the study presented evidence of a declining trend in the disparity of socio-economic development, the development gaps between less developed states and developed states have been an issue over the years. From the analysis performed, this study found that the economic sectors of agriculture and manufacturing play a crucial role in explaining variation in growth across Malaysian states. However, the findings reveal that states with a comparative advantage in manufacturing does not have any impact on the growth in the agriculture sector. Meanwhile, the growth of the agriculture sector is important in affecting the growth of the manufacturing sector positively. These findings provide guidance for policymakers that not only manufacturing, but also agriculture is important to boost the growth of the states' economies. Without too much reliance on manufacturing, the government plays a crucial role in supporting the agriculture sector through investments and research and training, so that the benefits of the sector can be utilised.

Since educational attainment is essential to explain the variations in the growth of GSDP and manufacturing across states, employers should offer learning and

development opportunities to motivate employees to continue developing their skills and knowledge. The findings also show a positive effect of population growth and state revenue on the changes in the growth of the states. The positive effect of state revenue implies that state economic growth depends on the institutional factors of commitment of both state and federal governments. The negative effect of forests on growth is worth exploring. Further research is necessary to understand the contribution of forests to growth and the factors that have undermined the significance of forests in the economy. The study also reports that the proportion of the Chinese ethnic is significant in explaining the disparity in economic growth within Malaysian states. By knowing these key determinants of growth, the potential areas to generate or maintain economic growth within Malaysian states is better understood.

The role of institutional factors in promoting a spatial balance in socio-economic development across states was further analysed in the second essay. The study analysed the pattern of development expenditure and the effect of the institutional factor of fiscal decentralisation on the changes in the fiscal behaviour of state governments. The results of fixed effect (FE) estimates reveal the presence of both unconditional and conditional convergences in development expenditure across states in Malaysia. The convergence implies that socio-economic development across states is pro-spatially equitable. However, accounting for the impact of other factors of decentralisation, initial per capita output, and state population growth has expedite the process of convergence in public finance. The findings report that states with a higher state per capita revenue or state-sourced per capita revenue or state-sourced revenue as a share of total revenue and state-sourced capacity as a share of the national average would have higher spending on development. Hence, how effective state governments are in collecting revenue and managing the distribution of resources is vital because it influences the process of development across states in Malaysia.

In addition, assistance from federal government through the transfer mechanism is important to strengthen the expenditure capacity of Malaysian states. As the performance of less developed states has been persistently below par comparative to the developed states, understanding the factors that affect the pattern of fiscal behaviour of the states might also reduce the gap in performance among the states. Therefore, the disparity in economic performance between less developed states and developed states could be reduced by maintaining less variation in the state per capita revenue, state-sourced per capita revenue, state-sourced revenue as a share of total revenue and state-sourced capacity as a share of the national average. In this regard, public finance

through the convergence in government spending should be performed effectively to attain equality in social welfare of the population. Due to non-availability of the data at the state level, the study could not examine the convergence of government spending on various types of government expenditure. However, since development expenditure includes spending on both social and economic sectors, the results of the study reveal the evidence of spatial balance in socio-economic development across states that occur through the pattern of government spending.

Lastly, the third essay of the thesis investigated the effect of fiscal decentralisation on the Malaysian economic growth. The study divided the group of government into three (federal, state and local governments) to measure the decentralised government in the economy. The Autoregressive Distributive Lag (ARDL) model was used in analysing annual time series data that covers the period from 1985 to 2015. The impact of fiscal decentralisation was examined based on two cases of revenue and expenditure decentralisation. The findings provide evidence in support of fiscal decentralisation as a key factor of economic growth. It is found that there is a positive significant effect of decentralised revenue at state government level but a negative insignificant effect at local government level on growth. In contrast, there is a negative insignificant impact of decentralised expenditure at the state level but a positive significant impact at the local level on economic growth. These results imply that state governments are more efficient in managing the revenue as compared to local governments while the situation is vice versa in the matters of expenditure. Hence, this study suggests that revenue assignments should be allocated to higher-level authorities of federal and state governments while responsibilities towards expenditure development should be distributed to local governments to stimulate economic growth of Malaysia. A mutual agreement among the three levels of governments is necessary to make this arrangement attainable.

More recently, the degree of decentralisation in the 2000s period shows a decreasing pattern. This is evidenced that a decline trend in the share of state governments in public finance is offset by an increase in the share of federal government. However, the findings indicate that the participation of state and local governments in public finance responsibilities should be fairly considered in order to promote economic growth. It is recommended for future study to quantify the optimal degree of decentralisation to avoid excessive imbalance between federal and subnational governments' finances in the context of Malaysian public finance. Another variable of labour force and the net export influence growth performance adversely.

Since decline in net export would enhance the economic growth of Malaysia, trade liberalisation and economic policies with regards to the component of trade, either export or import, should be reviewed more precisely.

## Appendix 1.1: Identification process

The identification process in the three-stage least squares (3SLS) system of simultaneous equations is based on following rules<sup>29</sup>:

1. In the right-hand side equation, determine the number of endogenous variables and label this  $m_i$ .
2. In the same equation, determine the number of exogenous variables and label this  $k_i$ .
3. In all the structural equations, determine the total number of exogenous variables plus any other variables included in an exog () or inst () selection, and label this  $K$ .
4. The system is underidentified if  $(K - k_i) < m_i$ . 3SLS estimation is not relevant on an underidentified system.

Prior to the above process, the study recognised the variables of  $\ln GSDP_{it}$ ,  $\ln Agr_{it}$ ,  $\ln Mfg_{it}$  and  $\ln Revenue_{it}$  as endogenous. Based on the financial statements of state governments, total state revenue is comprised of three components: tax revenue, non-tax revenue and non-revenue receipts. State tax revenue consists of petroleum royalties, export duties on minerals such as tin, ores, metal and other mineral oils produced in the state, excise duty on toddy shops, forests, land and mines, and entertainment. Due to this, the inclusion of natural resources in  $\ln Revenue_{it}$  is necessary. The sources of non-tax revenue are rental charges on state property, licensing fees, charges for water and Islamic religious revenue (e.g. *Zakat*, *Fitrah* and *Baitumal*). Meanwhile, non-revenue receipts consist of all refunds of expenditure and inter-department credits, federal grants and transfers. Nevertheless, the contribution of federal transfers to state revenue is insignificant at the state level. Based on the Ministry of Finance Economic Report (2008, 2014), the state governments rely on federal transfers for only 20-23 percent of their total income, having collectively generated their own revenue to a share of 77-80 percent of total state revenue over the years 2005-2014 (Hutchinson, 2015). Last but not least, political factors such as the government ruling party, the number of seats won in parliament and others are important determinants of total state revenue. In this context, this study includes the share of seats

---

<sup>29</sup> The manual for 3SLS estimation can be found at <https://www.stata.com/manuals13/rreg3.pdf>

held by Barisan Nasional (BN) in both the parliament and state legislative assembly to proxy for the political determinants of state revenue.

Next, the study proceeded with the identification process for the 3SLS estimation of the simultaneous equations based on the rules discussed earlier. The study found the system not to suffer from an underidentification problem. Table 1A summarises the identification process in four simultaneous equations  $\ln GSDP_{it}$ ,  $\ln Agr_{it}$ ,  $\ln Mfg_{it}$  and  $\ln Revenue_{it}$ .

Table 1A: Identification process in four simultaneous equations

Equation	$m_i$	$k_i$	$K$	$(K - k_i)$	$((K - k_i) < m_i)$ underidentified?
$\ln GSDP$	3	4	10	6	No
$\ln Agr$	2	4	10	6	No
$\ln Mfg$	2	3	10	7	No
$\ln Revenue$	1	2	10	8	No