THE EFFECT OF FISCAL POLICY ON ECONOMIC GROWTH IN ASEAN-5 COUNTRIES

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MASTER OF ECONOMICS

UNIVERSITI UTARA MALAYSIA
2011

The effect of fiscal policy on economic growth in ASEAN-5 countries

A thesis submitted to the College Arts and Sciences,

Universiti Utara Malaysia in partial fulfillment of the requirements

for the degree of Master of Economics,

Universiti Utara Malaysia.

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ABSTRACT

This thesis study the panel data to investigate the problem of fiscal deficit at five ASEAN countries namely Indonesia, Malaysia, Philippines, Thailand and Vietnam. Beside that, this analysis used the fiscal variable and country characteristics as the variable in this model based on GDP per capita. The variables in fiscal variable consist of total tax revenue (TTR), non tax (NT), productive expenditure (PE), total expenditure (TE), and budget deficit (BD). While for country characteristics the variable are population growth (PG), investment (I), government debt (GD) and external debt (ED). This thesis examines the standard method test for panel unit root test there is Maddala and Wu (1999). After that this thesis applies the cointegration method based on panel cointegration test by Pedroni (1999). A fully modified OLS (FMOLS) test is used to estimate the long run relationship in fiscal deficit at ASEAN-5 countries. As a result, we find out that all the variables are significant between them. This thesis recommends that policymakers should concern all of the significant variables since they give impact on fiscal deficit.

ABSTRAK

Kertas penyelidikan ini menggunakan data panel yang untuk mengkaji masalah fiskal defisit di lima buah negara ASEAN iaitu Indonesia, Malaysia, Filipina, Thailand dan Vietnam. Selain itu, analisis ini mengunakan pembolehubah fiskal dan ciri-ciri negara sebagai pembolehubah dalam model berdasarkan kepada KDNK perkapita. Pembolehubah yang terdapat dalam pembolehubah fiskal terdiri daripada jumlah penerimaan cukai (TTR), hasil bukan cukai (NT), pengeluaran produktif (PE), jumlah pengeluaran (TE) dan anggaran defisit (BD). Sementara itu, pembolehubah ciri-ciri negara yang digunakan adalah pertumbuhan penduduk (PG), pelaburan (I), hutang kerajaan (GD) dan hutang luar negara (ED). Kertas penyelidikan ini menggunakan kaedah piawai untuk mengkaji ujian *panel unit root* yang digunakan oleh Maddala dan Wu (1999). Kemudian, kertas penyelidikan ini mengaplikasikan kaedah kointegrasi menggunakan ujian *panel cointegration* oleh Pedroni (1999). Ujian *fully modified OLS* digunakan untuk menganggar hubungan jangka panjang fiskal defisit dalam negara-negara ASEAN. Hasil daripada ujian yang dijalankan mendapati kesemua pembolehubah adalah signifikan diantara mereka. Kajian ini mencadangkan pembuat polisi sepatutnya memberi perhatian tehadap semua pembolehubah yang signifikan kerana pembolehubah ini dapat memberi kesan kepada fiskal defisit.

ACKNOWLEDGEMENT

I would like to express my deep and sincere gratitude to my supervisor, Dr. Hussin Abdullah. His wide knowledge and her logical way of thinking have been of great value for me. His encouraging and personal guidance have provided a good basis for this thesis. His opinion has helped me a lot in completing this thesis. Special thanks for him for understanding of time-absorbing process required in completing this thesis.

I owe my loving thanks to my family especially my father Mohd Yunus b. Najmi for the understanding, encouragement and financial supports, which has enabled me to successfully complete my master study in UUM. Without their encouragement and understanding it would have been impossible for me to complete this work.

Special thanks to all my friends especially Surianti Mat Fiah, Haspinor Teh, Lynda Daud, Muhammad Baqir, and Salwa Hasyim who give impressive ideas and encouragement in completing this study successfully. Besides that, I also owe special thanks to all my friends especially Nur Hafizah Ramli, Nur Hazirah Mat Ludin, Nor Ermawati Hussain and Noor Aida Noh who always cheer my day up with their jokes and supports. Their assistance really means a lot to me.

Not forgetting, special thanks to the staff of Sultanah Bahiyah Library, Universiti Utara Malaysia, for their information, help and guidance during my study. Last but not least, I would like to thank everyone involved who has given inspirations and guidance whether directly or indirectly. Thank you.

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CHAPTER 1

INTRODUCTION

1.0 Introduction

Fiscal policy has received less attention by empirical researchers compared to that of monetary policy on the economic activity. Fiscal policy also plays a crucial role in economic growth of every country, hence, it is important to explain the stability in the macro environment for investment. The changed environment of liquidity constraints on external borrowing and slowdown in output growth has led to new attention being directed towards the role and contribution of fiscal policies in reviving growth in the ASEAN region (Gangopadhyay and Chatterji, 2005). Meanwhile, fiscal policy is predominantly viewed as an instrument to mitigate short run fluctuations of output and employment. By a varying government spending or taxation, fiscal policy aims at altering aggregate demand in order to move the economy closer to its potential output. Besides that, the primary goal of fiscal policy is to equilibrate the public sector's financing requirement with the private sector's demand for investment and a sustainable balance of payments.

Concern about fiscal deficits and debt has increased dramatically in recent years in virtually all over the world, and ASEAN countries are no exception. Fiscal deficit is a state of the economy which is very difficult to avoid but not always easy identifying in a countries. Fiscal policy is neither a cause of the crisis nor a critical determinant of economic growth. Nevertheless, its role in both the pre crisis and post crisis periods in five ASEAN countries (ASEAN-5) namely Indonesia, Malaysia, Philippines, Thailand, and Vietnam has been seen as crucial, primarily in terms of its contribution to economic growth. Figure 1.1 it can be seen that the ASEAN-5 countries that a problems of fiscal deficit of proceedings in the case of GDP. The data obtained on the fiscal balance has been supporting the general perception of fiscal discipline and prudent or conservative fiscal policy. The viewed from the perspective of current debate in the pre-crisis decade, policy concerns focused on the perceived overheating of ASEAN economies rather than concerns with fiscal and external sustainability.

Indonesia shows continuous improvement in managing its fiscal deficit with slight fluctuations. Indonesia had a fiscal deficit of 2.5 percent in 1999 and it came down to 0.1 percent in 2008. In the first five years from 1999 to 2003 Indonesia's average fiscal deficit stood at 1.8 percent and during in second five years it was managed a 0.7 percent.

Malaysia is an upper middle-income country with a record of strong economic performance and poverty reduction. Malaysia has a goal of transforming itself into a high income and developed nation. However the average deficit in 1999-2003 period

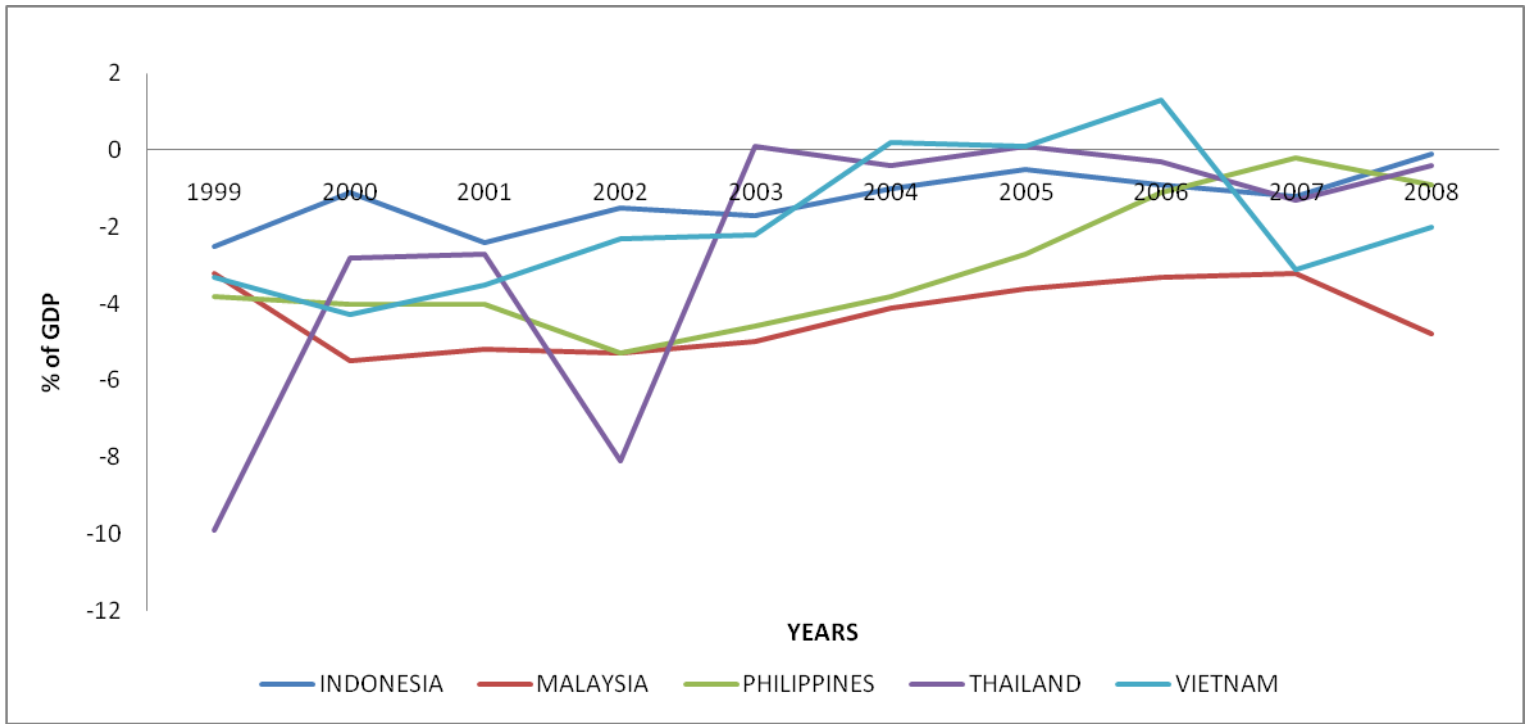
was about 4.8 percent and in the result five years it was managed at 3.8 percent. In 2008, Malaysia shows a higher fiscal deficit at 4.8 percent compared to 3.2 percent in 2007. That can be attributed to the global economic downturn.

The Philippines achieved unprecedented economic gains over the past years. The average deficit of the Philippines improved to 1.7 percent during the period of 2004 to 2008, from 4.3 percent in 1999–2003. According to Asian Development Bank (ADB), strong growth was accompanied by compassionate inflation, declining national government debt as a proportion of GDP, markedly reducing the fiscal deficit. In 2008 the global economic slowdown and financial crisis in advanced economies slowed growth of the entire world. But continued stability in the domestic finance sector and strength in the Philippines external payments position helped the economy to remain steady in 2009. (ADB, 2009)

The global financial crisis, coupled with the need to restore political stability and unity within the country presents Thailand with significant development challenges in the coming years. It can be seen after the financial crisis, Thailand had a deficit of 9.9 percent in 1999 and also, Thailand experienced a high deficit of 8.1 percent again in 2002, other than these two years with high deficits. The deficits in other years in 2003 and 2005 the total budget showed surplus are noticeable of 0.1 percent in both years. The main challenge faced by the government is to maintain economic growth in order to prevent negative impacts on society.

After the Asian financial crisis in the 1997-1999 periods Vietnam shows a steady economic recovery. In 1999 the deficit suffered by Vietnam was at 3.3 percent and it also experienced a volatile economic the next year. But in 2004 and 2006, Vietnam recorded a budget surplus at 0.2 percent and 1.3 percent respectively. The global economic crisis hit Vietnam hard in 2008, slowing the growth of exports and inflows of foreign portfolio investment. To mitigate the adverse impact of the crisis on growth, the State Bank of Vietnam, the country's central bank, loosened monetary policy significantly in late 2008.

Figure 1.1 : ASEAN-5 Economies; General Government fiscal deficit (percentages of GDP)



Source : Key Indicators for Asia and the Pacific 2009 (ADB,2009)

Nowadays, the governments of ASEAN-5 countries are to sustain economic growth to avoid negatively social and economic impacts associated with massive unemployment. Economic downturn could result of the decline of exports, foreign direct investment, or reduced expenditure of customers. But it is also reducing their foreign borrowings in order to avoid the problems associated with the increased foreign debt. Hence it is necessary emphasize investment in physical infrastructure, strengthening the domestic capital market, and improving the enabling environment for private sector investment. Accordingly, many countries are forced to either reduce their budget deficits, to see a decline in domestic investment, or to somehow increase private savings. Specific policy recommendations, from the ADB, IMF, World Bank, or the neo classical economists, are to reduce the financial deficit. This has, however, proven to be very difficult, considering the problems of the most countries' with stagnant tax collection, as well as unyielding public spending. Thus, we see that countries are unable to reduce current expenditure due to the fear of unemployment or protests against wage reduction that often reduces the public capital expenditure. This reduction has, in turn, the effect of reducing the productivity of the private sector and hence, economic growth (Feltenstein and Iwata, 2002). Global financial crisis, coupled with the need to restore political stability and unity within the country, presents ASEAN-5 countries with significant development challenges in the coming years.

1.1 Problem Statement

Fiscal positions vary significantly across countries and sub regions. Significant fiscal deficit and accumulation of public debt are relatively new phenomena for most ASEAN-5 economies. Enhance our technical understanding of how fiscal policy works for the development is of course important, but fiscal policy is more than just economic issues but also be the basis of the political development. Who gets what from the state, how public spending is financed, and who pays for it, says much about how a society is governed and the policy choices. However, expenditure growth outpaced revenue growth in many ASEAN-5 economies, leading to persistent budget deficits and high indebtedness. Weak fiscal positions have left little room for further fiscal expansion in most ASEAN-5 economies when faced by economic slowdown. Moreover, measuring fiscal policy has always posed a difficult challenge. Figure 1.1 shows the widest official measure of government fiscal deficit for ASEAN-5 economies.

1.2 Objectives of the Study

The general objective of this study is to understand the importance and the consequence of fiscal deficit in the ASEAN-5 countries. The specific objectives are:

i)To examine the relationship between fiscal variable and economic growth in ASEAN-5 countries.

ii) To examine the relationship between country characteristics and economic growth in ASEAN-5 countries.

1.3 Significance of the Study

This study would extend the literature by making some important contributions. Fiscal policy is mostly viewed as an instrument to mitigate short-run fluctuations of the output and employment. By changing government expenditure and taxation, fiscal policy aims at altering aggregate demand in order to move the economy closer to potential output. Several fiscal policy instruments are known to exhibit long-run effects. Early models of endogenous growth have introduced government expenditure categories as the engine of economic growth. Fiscal policy in the short run is considered expansionary when the government expenditure exceeds the government revenue. Based on the fiscal deficit in ASEAN-5 countries shown in Figure 1.1, the resulting deficit can be interpreted as a means to finance additional government expenditure. If this expenditure is growth enhancing, then a government deficit exhibits an indirect effect on long-run economic growth. Thus, this study attempts to analyze the impact of fiscal policy instruments on economic growth, in order to provide a synthesis of the recent literature on growth and fiscal policy. Besides that, this study uses Gross Domestic Product per Capita (GDPC) as proxy to economic growth. This study focuses on real GDP per capita with the intention of

isolating the effect of a change in population. However, growth in real GDP per capita should not be a policy goal in and of itself, it does serve as a very useful summary to measure a country's economic progress over time.

1.4 Scope of Study

This study focuses on the state of the ASEAN-5 countries namely Indonesia, Malaysia, the Philippines, Thailand, and Vietnam. Data collected for this study are from 1999 to 2008. The data covers of real GDP per capita, component of fiscal deficit views as ratios to GDP. The research done is related to the experiences faced by in ASEAN-5 countries in fiscal policy, especially in addressing the fiscal deficit for only one decade. The choice of the countries is basically due to three considerations. Firstly, the poor data availability for countries likes Brunei, Myanmar and other ASEAN countries. Secondly, this study attempts to look at the countries that have experienced fiscal deficit. Lastly, this study only considers the ASEAN countries with similar economics condition.

1.5 Structure of the Study

This study is presented in five main chapters. The first chapter is an introduction chapter, explains the background of the study, problem statement, research objectives, significant of study, scope of the study and the structure of the report. Chapter two discusses the issues of the literature review that was derived from a

variety of journals and books. The issues papers reviewed cover on economic growth, the distribution of income among ranging people and the real interest rate charged by banks during the period of budget deficit. Chapter three discusses the methodology used in this study. This chapter also discusses about the theoretical framework, specification of the model used, and estimation techniques the process of data collecting and methods used to analyze this data in the form of econometrics. Chapter four presents the empirical results of the analysis and the interpretation of the results. Lastly chapter five is the conclusions of the study and the related recommendations to solve the fiscal deficit in the countries involved.

CHAPTER 2

LITERATURE REVIEW

2.0 Introduction

The impact of budget deficits on economic activity has been one of the subjects of a long-standing debate in macroeconomics. Three distinct views emerge from the literature, revealing the complex relationship that exists between budget deficits and macroeconomic variables. There is no agreement among economists either on analytical grounds or on the basis of empirical results whether financing government expenditure by incurring a fiscal deficit is good, bad, or neutral in terms of its real effects, particularly on investment and growth. Among the mainstream analytical perspectives, the neo-classical view considers fiscal deficits detrimental to investment and growth, while in the Keynesian paradigm, it constitutes a key policy prescription. Theorists persuaded by Ricardian equivalence assert that fiscal deficits do not really matter except for smoothing the adjustment to expenditure or revenue shocks. While the neo-classical and Ricardian schools focus on the long run, the Keynesian view emphasises the short run effects.

2.1 Theoretical Frameworks

From neo classical view, the constituent of revenue deficit in fiscal deficits refer to reduce government saving or an increase government dissaving. In perspective neoclassical (*see*, Bernheim, 1989), examine that detrimental effect on growth will happen if the decline in government saving is not completely compensate by an increase in private saving, and then resulting overall saving rate fall. Apart from that, it giving the effect interest rate and indirectly influence in growth. In addition the neo classical economists assume when markets staying in state, it indicate that full employment of resources achievable. Besides, fiscal deficit also resulted occurrences of raise in lifetime consumption to future generations by shifting taxes that imposed by government. However, if all economic resources fully employed it will cause occurrences of increased in consumption which indirectly also given effect to declined savings in closed economy. While in open economy, interest rate and investment are not affected but decrease in national saving it causes by increase in external borrowing accompanied by improvement in domestic currency and decrease in export. If in this case, when national saving decrease and consumption increase it causes investment and export fall. Other than that, the neo-classical paradigms consider that the consumption by each individual has been determined, but it is only a temporary solution for this problem where both borrowing and lending are allowed in market interest rate.

In Keynesian view (*see*, Eisner, 1989), in the there were some unemployed resources, it can be concluded that in increase autonomous government expenditure,

whether from investment or consumption that are financed by borrowing which in turn to cause output to expand through the multiplier process. While in traditional Keynesian framework they did not distinguish whether alternative consumption in fiscal deficit as government consumption or investment expenditure, likewise they also did not distinguish alternative sources of financing in fiscal deficit within monetisation or external or internal borrowing. Furthermore, the Keynesian paradigm consider about prediction of the expansion in multiplier based on output will growing demand for money, but if money supply is constant and deficit is financed by bond, interest rates will increase incompletely compensate the effect of multiplier. However, the Keynesians argue that increased in aggregate demand will cause effectiveness expansion in private investment and also leads to increase investment in every interest rate that given. Other than that, the impact of rising interest rate could be neutralized by the effect of an increase in investment profit. Keynesian view that deficit may encourage saving and investment smoothly if interest rate rise, mainly, because the employment is not used until now, meanwhile at full employment, deficit will result crowding out. Keynesian in their analysis says that "if everyone thinks that a budget deficit makes them wealthier, it would raise the output and employment, and thereby actually make people wealthier".

Further, Keynesian provides some confidence that have positive effect in deficit at least in the short run, where it happen fluctuates in the some circles. It also argued that fiscal consolidation may lead to expansion that can pointed through cutting in government expenditure which means occurrence the reduction in taxes. In other word, if the government decides to reduce expenditure, then the tax payer would be

minimised tax payment in future, but then they will increase consumption and investment at the present after they realized it. If the increasing in consumption and investment are greater than decreasing government spending, then it will be the improvement in living standard and incomes.

In perspective of Ricardian equivalence (Barro 1989), they observe that fiscal deficit does not deeply affected to the growth. They also views that deficit at any current period is closely similar with present value of future taxation that entailment to pay off the increment debt that cause by deficit. Fiscal deficit could be use as the variable to find out the result of shock effect and consuming to expenses but financing through the tax would be dispersed over a time period. However, fiscal deficit will not give effect to aggregate demand if the household spending decisions based on their incomes present value that included in their present value account in future tax liabilities. Alternatively, a reduction in government saving during the fiscal deficit is caused by condition which may be accompanied by increase off setting in private saving, it makes reduction in national saving but investment does not change. Then it also has no impact in interest rates as well.

For one thing Ricardian equivalence also requires that "the assumption that individuals in the economy are foresighted, they have discount rates that are equal to governments' discount rates on spending and they have extremely long time horizons for evaluating the present value of future taxes." In particular, they are saving to concern of tax liabilities for future generation. In addition, in Ricardian approach

state that total budget deficit caused by the government include the current expenditure value. However, even if it seen when the current value is given, tax restructuring due by the budget deficit has no impact on the economy. In conclusion every school or an individual has a different idea and perception a few things. Lastly, concluded that neo classical view fiscal deficit as detrimental, while Ricardian approach fiscal deficit as irrelevant and Keynesian argued that fiscal deficit are beneficial.

2.2 Empirical Frameworks

Grossman (1982) examines the understanding and to evaluate recently expressed popular concern about fiscal deficits. At first this paper will discuss the problems that involved in while estimation the fiscal deficit. In conclusion, its point out that the federal fiscal deficit has increased substantially over the past years and likely to increase in the future. Then this paper will analyze the possible connections between fiscal deficits and inflation, economic growth, and fluctuations in the level and composition of economic activity. The main conclusion stand that in monetary policy, inflation, and aggregate economic activity is independent to fiscal deficit, but the fiscal deficit have the effects on the dissection of output between consumption and investment. In addition the effects of taxation on consumption and investment demands and the relations between real and financial developments are analyzed. This paper also indicated that rising in interest rate may create pressure for federal government to decrease government expenditure. They also denote that separating

between monetary and fiscal on inflation is difficult because the fiscal deficit may have an impact on monetary policy. This paper also stands, reducing in investment can causes the less growth and innovation on capital stock and then it makes the fiscal deficit become more worsen in economics. Although fiscal deficit also affect on interest rate and capital size that used by government, but it indirectly also give effect on monetary policy because it can steady inflationary impact that due to deficit. Apart from that also end up, if larger interest rate from monetary policy, change in tax seriously necessary. In short, even though reduces in interest rate affect on the recovery or recession in economics and reduction in fiscal deficit, it does not mean decline production or increase of tax will cause economic activity recovered.

Based on analysis of Diamond (1965) and extension in open economy by Buiter (1981), they found that if the economy staying in the efficient, while deficit financed with tax deduction to current young generation will increase their welfare on future generation welfare expenditure and the reduction in size distribution intergenerational. In a small open economy that deduction in tax does not influence in domestic real interest rate or domestic capital stock, so that the burden are sustained increase in government debt is only difference between the interest rate and growth rate whether or not there is a source taxation on capital income. Yet, deduction in tax that accompanied by an increase in government debt could bring benefit to current young generation on all future generation expenditure, where there is no internal change real wage before tax from each generation of employee, but after tax wage it resulted in an increase for the current generation and decrease in future generation.

Diamond (1965) on this paper studies the effects of budget deficits in the perspective of such models. Diamond view the change is remains increases in the rate of domestically that held debt by the national income depresses capital labour ratio at steady state. Apart from that found that at original interest rate, consumers are refused to hold onto the original volume of physical capital and bonds, likewise new bonds. While, increasing in interest rates simulative expansion in saving and decrease investment until re-establish capital market equilibrium, so, government deficits continuously crowd out private capital accumulation. Diamond in their analysis focus on changes frequently in deficits, and does not take into account on effects in temporary changes.

Feldstein and Horioka (1980) and Feldstein (1983) believed that the fact if the OECD countries have the higher savings rates they also have higher investment rates, this will proves that the international capital market are still far from perfect, while in analysis of the impact on capital income taxation can be perform, if every country are in a particularly close in international lending and borrowing. Obstfeld (1986), using the life cycle model of a small open economy that developed by Buiter (1981) and Persson (1985), indicated that how cross-country differences in growth rates can make correlation of cross country to become positive between saving and investment rates although a completely integrated at international capital market.

While Burgess D.F (1996) state that welfare effect also give on government deficit in simple life cycle economy, in which it allows us borrowing at interest rates and

import price have been determined although it cannot be exploited or enter in export market. Although there is a perfect integration of capital market, the deficit is financed by tax deduction would result in an increase in the real exchange rate, increase after tax wage rate in excess of tax deduction and finally lowering the domestic rate of return assets. Furthermore, the deficit became more worsen when the value of real exchange rate not in a stability state and occurrence of after tax wages decline that greater than tax increase entailment. As conclusion, conclude that at small open economy, government debt has not affected by domestic interest in long run but government debt will increase in short run, which is finance by temporary tax deduction from young generation, but it causes to accept exchange rate. Even though, the welfare effect from temporary fiscal deficit are preferred and complicated in almost at small open economy. Finally exchange rate attains lower at steady state, while temporary fiscal deficit lead to adjustment the trade balance and current account compare to adjustment the period after deficit occurs in small open economy.

Adam and David (2001) observe the relation between fiscal deficits and growth for developing countries. Based on his studies of the government budget constraint, it finds the indication of a threshold effect at a level of the deficit of GDP. Other than that, they also find the interaction effects between deficits and debt stocks, with high debt stocks it can causes high deficits. They also examine that possible non-linearity in the relation between growth and the fiscal deficit for developing countries. This possibility showing to be consistent with our simple growth model in two types of

non-linearity, there is size of the deficit and the other interactions between the deficit and the public debt stock. Furthermore, econometrics analysis in this paper also identifies that existence interaction of stock flow and threshold effect in deficits. In addition, they also finds that thresholds involve not only a adjust of slope but also a change of sign in the relation at any rate of the budget, indicated that for economics not in steady state growth there are various financing deficit where possible increase growth. In short, the authors review the possible impact of a variety of fiscal magnitudes on the growth on developing countries by using the simple overlapping generation model (OLS). Accordingly previous analysis, the relation between deficit and growth is linear but in this paper the result indicate that the impact on the budget deficit on growth is significant non linearity.

In model that addresses by the Barro (1989) shows the relationship between possible money and the deficit is extension. In that model, Barro states that the government gives priority to the real values of the deficit. Therefore, this will cause the government will increase the nominal deficit to offset inflation rate. However, inflation is one of the variables as a consequence of excessive money growth. Inflation, however, it is primarily the result of excessive money growth. Therefore, it is right to assume that increased in money growth, due to the increase in inflation will cause estimate deficit to be higher.

Jha, R. (2001) studies the macroeconomics effects to fiscal policy, mostly in deficit at developing countries. In this paper, he believes that the existence of differences

related to experience with fiscal deficits in the group of developing countries. Although there is a clear distinction between the categories of middle-income countries with low-income countries, but this mid-income countries are classified in the category of low-income countries. So there is significant variation between countries in the group of developing countries with respect to the options available to the public and in the case of loans on a large fiscal deficit. Hence, this paper considers some aspect that affect the fiscal policy on macroeconomics adjustment in developing countries.

Buiter (1985, 1993) have gone further ahead and argued that even with regularly adjusted and inflation adjusted measure of the deficit is not accurate indicators of the real deficit. This will show when, the capitals gain or losses on government assets and liabilities are not integrated in conventional flow of funds accounts. Other than that it also includes changes in relative prices and changes in the real value of debt over the basic measure of inflation episodes.

Auerbach and Kotlikoff (1987) in their analysis emphasizes that the direct impact of a temporary budget deficit might be very small, and also temporary deficit might encourage saving in the short run. To start with, economic lives are that long enough, so the impact of an additional for lifetime of wealth is small in current consumption. Apart from that, if a holding government spending constant, later it makes temporary deficits reflect to tax reductions and implies the marginal tax rates become lower. After that, reduce taxation of capital of income levels is directly stimulate savings by

increasing the tax rate after payment capital income tax rates stimulate saving directly by raising the after tax rate of return. Temporarily lower labour income taxes rates motive inter temporal replacement, increasing in current income, and as such saving. For reasonable restriction values, these effects may turn into the direct effect on wealth. Thereby, the Neo-classical paradigm argued that temporary deficits must be comprised influence that very small or gives an adverse impact on economic variables in the short run. Auerbach and Kotlikoff consider that wealth effects increase over time, indirectly temporary deficits could eventually avoid in the private capital formation happen.

Cashell (2005) explains a public expression of relative preference for present against future consumption. For now, however, the public sectors also have main effects on the pool of savings. Whether it been improved in budget surplus or deficit, which makes budget to clear out all consequences for the economy. In addition at short run, whether the budget in surplus, it makes a few differences in economic performance. In the short run also, changes in surplus or deficit which can influence economic growth rate. Furthermore, reduction in deficit would be inclined contracted, while an increase in deficit will be likely to be simulative. However, all those effect shown to be happen in the short period.

Meanwhile in long run, a change from a budget surplus to deficit represents a decreasing in national saving. In addition, less saving means a change from future consumption to present consumption. In other word, consume more in current time it resulting in decreasing an investment at the present time and also makes decreasing in level of goods and services in future and also caused less in future and otherwise.

Moreover the investment is financed is funded by importing capital from other countries, and some of higher production was due to foreigners. Despite a budget deficit, the federal debt may still reduce based on GDP, but it also depends on the size of the deficit, and the payment of interest on unpaid debt. Lastly, if the ratio of debt to GDP increase this will lead to risk of inflation happen.

According to Sargent and Wallace (1981), an established theory in macroeconomics is the government running a deficit on an ongoing basis, either fast or slow to fund the deficit and the incidence of money resulting inflation in the economy. Although this theory does not reflect on the importance of other mechanisms which may trigger inflation and fiscal imbalances cause the centre of most models. The fiscal economic observers notice that inflation has been prominent in developing countries, and has long said that the lack of efficient tax collection, political instability, and more limited access to external borrowing tends to lower the relative costs and increasing reliance on seigniorage tax inflation.

Antonini (2004) described and introduced the overlapping generation model of endogenous growth. Public investment is the most important variables in addition to increase the growth of labour productivity growth. Besides, they also discuss about the sustainability of the situation deficit financing of public investment and the effect of the obligation of restrictions the size of fiscal deficits. It was found that in the context of exogenous growth is the same as the previous. However, studied using this model has found that in certain situations, it will not reduce the primary deficit at least for a while without falling public investment.

Kihaule A.M (2006) in their paper result that fiscal adjustment policies emphasized that an increase in tax revenue and deduction in public spending should be corrects the fiscal deficit in country. Nevertheless, there some restricted the impact of fiscal policies to correcting the fiscal deficit, because it may be cause decrease in GDP growth and pointed the tax base. In other word, when government use fiscal adjustment policies, it makes lead low GDP growth and changes in tax structures in way to reducing the fiscal deficit. To response this policies, government need to have alternative tax base that could compensate for declining in GDP growth. As a conclusion, the economic policy that restructuring by government cause the primary change in economy with implication for macroeconomic and fiscal policies in the country. In addition, the fiscal adjustment policies are less effective to use in several countries as the way to correct or solve the fiscal deficit.

In Tyszler (2008) experimental study view that political economy literature features model in which the deficit is a strategic variable used to tie for future incumbent with different political goals than the current government. While in paper that study by Persson and Syensson(1989), Alesina and Tabellini (1990) and Tabellini and Alesina (1990) examine a simplified two period model is esed to study the strategic use of deficit, having as essential variables the probability of reelection and the degree of polarization in the electrorate. In empirical literature test shows the differing results in these model (Sutter,2003). At single countries that study by Pettersdon-Lidbom (2001) prove that the evidence support that model, while the cross country that study by Franzese (2001) do not support. As a result, it seems need to indicate empirical study based on panel data that combine with main characteristics of cross section and

time series. Lambertini (2003) observe the collecting such data in the field, there are no clear result because the limited data availability.

While Sutter (2003) use an experimental method to study the strategic use of fiscal deficit. Sutter also designs to provide both analysis between single country and between cross country and makes empirical fields results in this model. In summary, some economists present theoretical models as the strategic use of deficit and Sutter (2003) use simplified model to test the single country and cross country by using field data. In this paper Marcelo Tyszler (2008) extend the Sutter (2003) design but use panel data techniques and remarkably result are significant as same as the model are provided.

2.3 Conclusion

In previous study in the literature review above show that budget deficit is difficult to define because sometimes the problems will involve while estimation the budget deficit. In previous study it also show possible connection between budget deficit and tax, debt, saving, investment, consumption and interest rate. In next chapter this study will discuss the research methodology, expected relationship between fiscal variable and country characteristics with GDP per capita and also explain the econometric procedure in order to find the relationship between the variables.

CHAPTER 3

METHODOLOGY

3.0 Introduction

This chapter will focus on the model specification based on the theoretical arguments in the literature. This study explains about the method and procedure been used to analyze the fiscal deficit at the five ASEAN countries. In this section we will also discuss about the dependent variables in which the fiscal variables refer to GDP per capita (GDPC), total tax revenue (TTR), non tax (NT), productive expenditure (PE), total expenditure (TE) and budget deficit (BD). Meanwhile, countries characteristic refer to GDPC, population growth (PG), investment (I), government debt (GD) and external debt (ED). In section 3.1, we will discuss about the empirical specification for our analysis. Furthermore in the section 3.3, we will discuss about the measurement of variable based from section 3.2. After that, in section 3.4 we will discuss about the techniques and procedures of the econometric analysis. Finally, in section 3.5 we will discuss about the sources of data. A brief description of data employed in the study is given at the end of the chapter.

3.1 Specification of the Model

In this section, the discussion is focused on the specification of the model and then divided the data for fiscal variables or country characteristics. This study employed the panel unit root test methodology to determine the direction of causality between GDPC growth and total tax revenue, non tax, productive expenditure, total expenditure, budget deficit, population growth, investment, government debt and external debt. To verify the variables, Maddala and Wu based on the well-known Dickey-Fuller procedure been used. The Augmented Dickey-Fuller (ADF) Unit Root Tests was employed to test the integration level and the possible relationship among the variables. This econometric test is foregoing with the stationarity and cointegration test on the variables employed in the study.

A simple functional model is presented thus:

a) Fiscal variable

$$GDPC = f (TTR, NT, PE, TE, BD) \quad (3.1)$$

b) Country characteristics

$$GDPC = f (PG, I, GD, ED) \quad (3.2)$$

In an econometric format:

$$\ln GDPC_{it} = \beta_0 + \beta_1 \ln TTR_{it} + \beta_2 \ln NT_{it} + \beta_3 \ln PE_{it} + \beta_4 \ln TE_{it} + \beta_5 \ln BD_{it} + \varepsilon_t \quad (3.3)$$

$$\ln GDPC_{it} = \alpha_0 + \alpha_1 \ln PG_{it} + \alpha_2 \ln I_{it} + \alpha_3 \ln GD_{it} + \alpha_4 \ln ED_{it} + \varepsilon_t \quad (3.4)$$

Equation (3.3) show the fiscal variable although Equation (3.4) shows the country characteristics where, $GDPC$ is a GDP per capita, TTR represents total tax revenue, NT is a non tax, PE is a productive expenditure, TE is a total expenditure and BD are budget deficit, while PG is a population growth, I is a investment, GD is a government debt and ED is a external debt, i is a cross-section data for countries referred to, and t is a time series data, ε_{it} is an error term. The constant is denoted for β_0 both equations while $\beta_1 - \beta_6$ for Equation (3.3) and for $\beta_1 - \beta_5$ Equation (3.2) are the coefficients showing how much a one unit increase in each individual variable will affect the GDPC.

From the equation (3.3), the expected coefficient α_1 are negative or positive. The expected coefficients are positive for α_2 and α_3. The expected coefficient used for α_4 and α_5 is negative. Beside that from the equation (3.4), the expected coefficient α_1 are negative or positive. The expected coefficients are positive for α_2 and α_4. The expected coefficient is summarized in the Table 3.1 and Table 3.2.

Table 3.1: Fiscal Variable

Specific Variable	Expected Sign
Total Expenditure	Negative
Productive Expenditure	Positive
Non tax	Positive
Total Tax Revenue	Positive or negative
Budget Deficit	Negative

Table 3.2: Country Characteristics

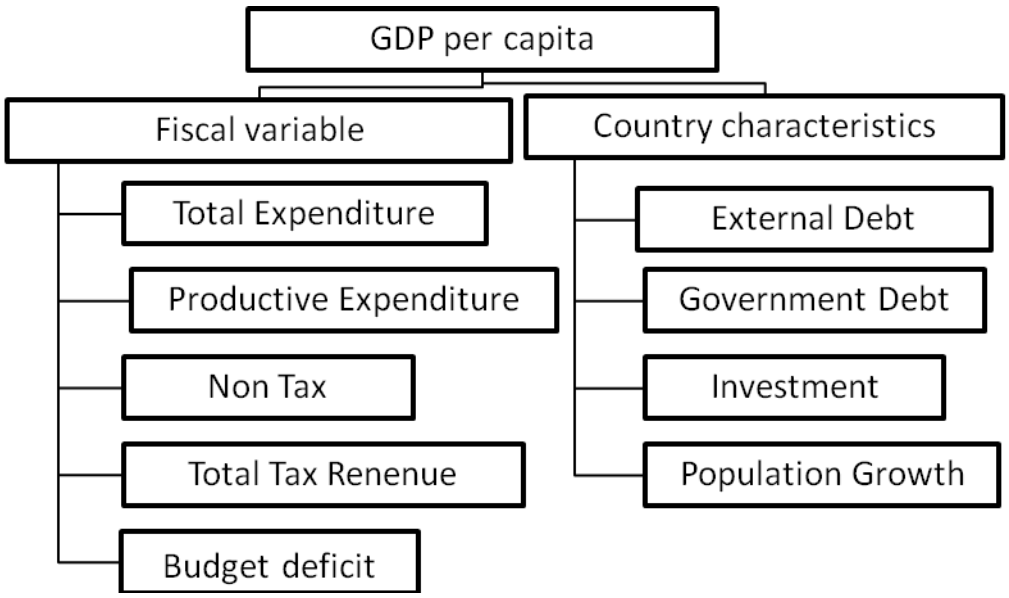
Specific Variable	Expected Sign
External Debt	Positive
Government Debt	Positive
Investment	Positive
Population Growth	Positive or negative

From the Table 3.1 and Table 3.2, we can state that as per theories of non tax, productive expenditure, investment, government debt and external debt direct impact to GDP per capita. Otherwise total expenditure and budget deficit have negative correlated with GDP per capita. Meanwhile total tax revenue and population growth is undecided.

3.2 Measurement of Variables

In this section, we discuss a detailed description and measurement of the variable in our econometric models at equation (3.1) and (3.2). It will divide into two, which are fiscal variable and country characteristics:-

Figure 3.1: Measurement of Variables



The detail about Figure 3.1 above will be in the following discussion.

a) Gross domestic product per capita (GDPC)

GDP per capita could be viewed as a rough indicator of a nation's prosperity. Nevertheless, GDP per capita are commonly used to compare the economic performance of different countries. Then we also examine the impact of factors such as total tax revenue, non tax, productive expenditure, total expenditure, budget

deficit, population growth, investment, government debt and external debt, in affecting GDP per capita.

b) Total expenditure

Total expenditure is proportional to the size of the economy production. Therefore total expenditure has impacts on GDP per capita. Devarajan, et al. (1996) examined the relationship between the share of total government expenditure in GDP and the growth in per capita real GDP, and they found negative and significant relationship between those two variables. Hence there are expected negative coefficient between total expenditures and GDP per capita.

c) Productive expenditure

Productive government is important to determine the economic. Productive expenditure is the expenditure for the purpose of making subsequent sales. Besides that, productive expenditures it made by business firms in buying capital goods of all descriptions and in paying wages. Other than that, productive expenditure could be described as a component of public expenditure, so productive expenditure is expectedly positive in terms of its relationship with GDP per capita. It is because rise in productive expenditure also increase the output of countries.

d) Non tax

There are certain non-tax economic policies that could have a significant impact on the economy. These non-tax economic policies could have substantial effects on revenue collection. Apart from that non-tax, economics will indeed be growth inducing. This variable have positive expected value coefficient to GDP per capita.

e) Total tax revenue

Total tax revenue is associated with the size of the public sector that could have an effect on GDP per capita but in the sense that they can be positively or negatively associated with GDP per capita. It is attributed by the tax structure to the GDP per capita, with different tax policy or rate having different effects to economic policies. Thus the amount of tax revenues available will determine the level of government spending. The expected value of the coefficient of total tax revenue is uncertain, which could be positive or negative effects on the GDP per capita.

f) Budget deficit

A **budget deficit** is a common economic phenomenon, generally taking place on governmental levels. Budget deficit occurs when the spending of a government exceeds its financial savings. In fact, budget deficit normally happens when the government does not plan its expenses, after taking into account its entire savings. Therefore the budget deficit will lead recession of the economy. More generally, aid shortfalls widen the budget deficit with its expected negative effects on GDP per capita.

g) External debt

External debt is one of the sources of financing capital formation in any economy. On the other hand, external debt acts as a major constraint to capital formation in developing nations. External debt to GDP ratio provides some potential indication to serve the external debt by switching resources from production of domestic goods to the production of exports so we acknowledged that the expected correlation between external debt and GDP per capita is a positive sign.

h) Government debt

Government debt is a key indicator of the government sector's financial position. In develop countries (ASEAN), all governments debt have positive debt. It is because in many cases, debt is sizable relative to GDP per capita. Therefore the expected sign for government debt has positive coefficient in this study.

i) Investment

Investment is one of the revenue received by any countries. It also contributed significantly in calculation of the GDP per capita. An investment is expected to have positive relationship to GDP per capita.

j) Population growth

Population growth is one of the main variables that would impacts the GDP per capita. The expected value of the coefficient of population growth is uncertain, which it could be positive or negative effects on the GDP per capita. In Malthus theory, there are positive relationship between population growth rate and GDP per capita. While in Solow model, there is negative relationship between population growth rate and GDP per capita.

3.3 Estimation Procedure

The objective of this section is to explain the relevant econometric procedures in testing time series data and panel data. The most appropriate estimation procedure will be discussed under various conditions so as to allow us to achieve the specific

objective that is to examine the relationship between fiscal variables and country characteristics to economic growth in ASEAN-5 countries.

3.3.1 Panel Unit Root Tests

In order to investigate the possibility of panel cointegration, it is first necessary to determine whether real GDP per capita and the independent variables evolve as unit root processes. There are several unit root tests specifically for panel data which have been introduced in past decades. Among them are Quah (1992, 1994), Levin and Lin (1992, 1993), Maddala and Wu (1999), Hadri (2000), Levin, Lin and Chu (2002), and Im, Pesaran and Shin (1997, 2003). This panel unit root test is a continuation of the univariate unit root test identified earlier but which has low power like the augmented Dickey-Fuller test (Said and Dickey, 1984). The panel unit root test as above has the specification for a null hypothesis and an alternative and methodology to identify problems such as heterokedasticity and different correlations. Each panel unit root test data has its own benefits and limitations and for this study we have chosen the Maddala and Wu (1999) which are based on the well-known Dickey-Fuller procedure.

3.3.1.1 Maddala and Wu (MW; 1999)

Maddala and Wu (1999) denoted as MW developed a test based in the probability values of all root unit individual tests. An alternative approach to panel unit root tests

uses Fisher's (1932) results to derive tests that combine the *p*-values from individual unit root tests. This idea has been proposed by Maddala and Wu (1999). If we define π_i as the *p*-value from any individual unit root test for cross-section *i*, then under the null of unit root of all *N* cross–sections, we have the asymptotic result:

$$-2\sum_{i=1}^{N}\log(\pi_i) \rightarrow \chi^2_{2N} \tag{3.5}$$

The asymptotic χ^2 and standard normal statistics using ADF and the null and alternative hypotheses are the same as for the IPS. When the Fisher test is based on ADF test statistics, we must specify the number of lags used in each cross-section ADF regression. Maddala and Wu (1999) are showed that it is more powerful than the t-bar in IPS test. Its disadvantage is that the significance levels have to be derived by means of Monte Carlo simulations. Maddala and Wu (1999) argue that while the Im *et a*l (1997) test relaxes the assumption of homogeneity of the root across units, several difficulties still remain. Specifically, this test assumes that T is the same for all the cross-section units, and hence requires a balanced or complete panel (i.e. where the units are observed over the whole sample period). Also, it only allows for a limited amount of cross-correlation across units through common time effects.

3.4 Cointegration Tests

Conventional cointegration tests tend to suffer from unacceptably low power especially when applied to a series of moderate length. Therefore, we used panel data methodology to address this issue by making available more information by pooling data across individual countries. Panel cointegration test allows for selective pooling of information regarding common long-run relationships from across the panel while allowing the associated short run dynamics and fixed effects to be heterogenous across different members of the panel (Kumari, 2004).

3.4.1 Panel Cointegration Tests

The next step is to test for the existence of a long-run relationship among real per capita GDP growth rates and the independent variables. For panel cointegration, the tests suggested by Pedroni (1999, 2004) are employed. We will make use of seven panel cointegrations by Pedroni (1999, 2004), since he determines the appropriateness of the tests to be applied to estimated residuals from a cointegration regression after normalizing the panel statistics with correction terms.

Pedroni (1999, 2004) extends the Engle and Granger (1987) two step strategies to panels and rely on ADF and PP principles. First, the cointegration equation is estimated separately for each panel member. Second, the residuals are examined with respect to the unit root feature. If the null hypothesis is rejected, the long-run

equilibrium exists, but the cointegration vector may be different for each cross section. In addition, deterministic components are allowed to be individual specific. The residuals are pooled either along the within or between dimension of the panel, giving rise to the panel and group mean statistics (Pedroni, 1999). In the case of the panel statistics the first order autoregressive parameter is restricted to be the same for all cross sections. If the null is rejected, the parameter is smaller than 1 in absolute value, and the variables in question are cointegrated for all panel members. In the group statistics, the autoregressive parameter is allowed to vary over the cross section, as the statistics amount to the average of individual statistics. If the null is rejected, cointegration holds at least for one individual. Hence, group tests offer an additional source of heterogeneity among the panel members (Dreger and Reimers, 2005). To a certain limit, the statistics are distributed as standard normal with a left hand side rejection area, except for the variance ratio test, which is right sided. Standardization factors arise from the moments of Brownian motion functional. The factors depend on the number of regressors and whether or not constants or trends are included in the cointegration relationships.

The procedures proposed by Pedroni make use of estimated residual from the hypothesized long-run regression of the following form (Pedroni, 1999):

$$y_{i,t} = \alpha_i + \delta_i t + \beta_{1i} x_{1i,t} + \beta_{2i} x_{2i,t} + \ldots + \beta_{Mi} x_{Mi,t} + e_{i,t} \qquad (3.6)$$

for $t = 1,.....,T;\ i = 1,....,N;\ m = 1,\ ...., M,$

where *T* is the number of observations over time, *N* number of cross-sectional units in the panel, and *M* number of regressors. In this set up, α_i is the member specific intercept or fixed effects parameter which varies across individual cross-sectional units. The same is true of the slope coefficients and member specific time effects, $\delta_i t$. The tests for the null of no cointegration are based on testing whether the error process e_{it} is stationary. This is achieved by testing whether $\rho_i = 1$ in:

$$\hat{e}_{it} = \rho_i \hat{e}_{it-1} + v_{it} \tag{3.7}$$

Pedroni (1999) has proposed seven tests which can be divided into two groups of panel cointegration statistics designed to test the null hypothesis of cointegration between the variables in Equation (3.6) against the alternative hypothesis of cointegration. Gutierrez (2003) states that the first category of four statistics we consider is what Pedroni labels as within-dimension statistic or Panel *t*-statistic which includes a variance ratio statistic, a non-parametric Philips and Perron type for *ρ*-statistic, a non-parametric Phillips and Perron type *t*-statistic and a Dickey-Fuller type *t*-statistic. The second category of three panel cointegration statistics is defined as a between-dimension statistic or group *t*-statistic including a Phillips and Perron type *ρ*-statistic, a non-parametric Phillips and Perron type *t*-statistic and finally an Augmented Dickey-Fuller type *t*-statistic.

The first category of test uses the following specification of null and alternative hypothesis,

$$H_0 : \rho = 1, \qquad H_1 : \rho < 1. \tag{3.8}$$

While the second category of tests uses

$$H_0 : \rho_i = 1, \qquad H_1 : \rho_i < 1 \text{ for all } i. \tag{3.9}$$

Pedroni (1999) proposes the heterogeneous panel and heterogeneous group mean panel test statistics to test for panel cointegration as follows:

1. Panel *v*-statistic:

$$T^2 N^{3/2} Z_{\hat{v},N,T} = T^2 N^{3/2} \left(\sum_{i=1}^{N} \sum_{t=1}^{T} \hat{L}_{11i}^{-2} \hat{e}_{i,t-1}^2 \right)^{-1} \tag{3.10}$$

2. Panel ρ-Statistic:

$$T\sqrt{N} Z_{\hat{\rho}N,T-1} = T\sqrt{N} \left(\sum_{i=1}^{N} \sum_{t=1}^{T} \hat{L}_{11i}^{-2} \hat{e}_{i,t-1}^2 \right)^{-1} \sum_{i=1}^{N} \sum_{t=1}^{T} \hat{L}_{11i}^{-2} \left(\hat{e}_{i,t-1} \Delta \hat{e}_{i,t} - \hat{\lambda}_i \right) \tag{3.11}$$

3. Panel *t*-Statistic (non-parametric):

$$Z_{tN,T} = \left(\tilde{\sigma}_{N,T}^2 \sum_{I=1}^{N} \sum_{T=1}^{T} \hat{L}_{11i}^{-2} \hat{e}_{i,t-1}^2 \right)^{-1/2} \sum_{i=1}^{N} \sum_{t=1}^{T} \hat{L}_{11i}^{-2} \hat{e}_{i,t-1}^2 \left(\hat{e}_{i,t-1} \Delta \hat{e}_{i,t} - \hat{\lambda}_i \right) \tag{3.12}$$

4. Panel t-Statistic (parametric):

$$Z^{*}_{tN,T} = \left(\tilde{s}^{2}_{N,T} \sum_{i=1}^{N} \sum_{t=1}^{T} \hat{L}^{-2}_{11i} \hat{e}^{*2}_{i,t-1} \right)^{-1/2} \sum_{i=1}^{N} \sum_{t=1}^{T} \hat{L}^{-2}_{11i} \hat{e}^{*}_{i,t-1} \Delta \hat{e}^{*}_{i,t} \tag{3.13}$$

5. Group ρ-Statistic:

$$TN^{-1/2} \tilde{Z}_{\hat{\rho}N,T^{-1}} = TN^{-1/2} \sum_{i=1}^{N} \left(\sum_{t=1}^{T} \hat{e}^{2}_{i,t-1} \right)^{-1} \sum_{t=1}^{T} \left(\hat{e}_{i,t-1} \Delta \hat{e}_{i,t} - \hat{\lambda}_{i} \right) \tag{3.14}$$

6. Group *t*-Statistic (non-parametric);

$$N^{-1/2} \tilde{Z}_{tN,T^{-1}} = N^{-1/2} \sum_{i=1}^{N} \left(\sum_{t=1}^{T} \hat{e}^{2}_{i,t-1} \right)^{-1/2} \sum_{t=1}^{T} \left(\hat{e}_{i,t-1} \Delta \hat{e}_{i,t} - \hat{\lambda}_{i} \right) \tag{3.15}$$

7. Group t-Statistic (parametric):

$$N^{-1/2} \tilde{Z}^{*}_{tN,T} = N^{-1/2} \sum_{i=1}^{N} \left(\sum_{t=1}^{T} \hat{s}^{*2}_{i} \hat{e}^{*2}_{i,t-1} \right)^{-1/2} \sum_{t=1}^{T} \hat{e}^{*}_{i,t-1} \Delta \hat{e}^{*}_{i,t} \tag{3.16}$$

where

$$\hat{\lambda}_{i} = \frac{1}{T} \sum_{s=1}^{k_i} \left(1 - \frac{s}{k_i + 1} \right) \sum_{t=s+1}^{T} \hat{\mu}_{i,t} \hat{\mu}_{i,t-s}, \tag{3.17}$$

$$\hat{s}^{2}_{i} = \frac{1}{T} \sum_{t=1}^{T} \hat{\mu}^{2}_{i,t}, \;\; \hat{\sigma}^{2}_{i} = \hat{s}^{2}_{i} + 2\hat{\lambda}_{i}, \tag{3.18}$$

$$\tilde{\sigma}^{2}_{NT} = \frac{1}{T} \sum_{t=1}^{T} \hat{L}^{2}_{11i} \hat{\sigma}^{2}_{i}, \quad \hat{s}^{*2}_{i} = \frac{1}{T} \sum_{t=1}^{T} \hat{\mu}^{*2}_{i,t} \tag{3.19}$$

$$\tilde{s}_{N,T}^{*2} = \frac{1}{N}\sum_{i=1}^{N}\hat{s}_i^{*2} \tag{3.20}$$

and

$$\hat{L}_{11i}^{2} = \frac{1}{T}\sum_{t=1}^{k_i}\hat{\eta}_{i,t}^{2} + \frac{2}{T}\sum_{T=1}^{T}\left(1-\frac{s}{k_i+1}\right)\sum_{t=s+1}^{T}\hat{\eta}_{i,t}\hat{\eta}_{i,t-s} \tag{3.21}$$

and where the residuals $\hat{\mu}_{i,t}$, $\hat{\mu}_{i,t}^{*}$, and $\hat{\eta}_{i,t}$ are obtained from the following regressions:

$$\hat{e}_{i,t} = \hat{\gamma}_i \hat{e}_{i,t-1} + \hat{\mu}_{i,t} \tag{3.22}$$

$$\hat{e}_{i,t} = \hat{\gamma}_i \hat{e}_{i,t-1} + \sum_{k=1}^{K_i}\hat{\gamma}_{i,k}\Delta\hat{e}_{i,t-k} + \hat{\mu}_{i,t}^{*} \tag{3.23}$$

And

$$\Delta y_{i,t} = \sum_{m=1}^{M}\hat{b}_{mi}\Delta x_{mi,t} + \hat{\eta}_{i,t} \tag{3.24}$$

Δ is the first difference operator. Pedroni suggests some adjustments for each of all test statistics (both for panel unit root tests and panel cointegration tests) described above that produces standard normal distributions (Hatemi and Irandoust, 2005). According to Pedroni, those seven test statistics can be rescaled so that they are distributed as standard normal.

The standardization of the cointegration statistics can be expressed as

$$\frac{K_{NT} - \mu\sqrt{N}}{\sqrt{v}} \Rightarrow N(0,1) \qquad (3.25)$$

Where K_{NT} is the standardized form of the test statistic with respect to N and T. The value of the mean (μ) and the variance (ν) are tabulated in Pedroni (1999). The values of the normalized statistics are to be compared to the critical values implied by a one-tailed standard normal distribution. Consequently for the panel variance test the right tail of the standard normal distribution (large positive value) is used to reject the null of no cointegration and for the other six tests the left tail is used (large negative value imply rejection of the null).

Harris and Sollis (2003) argue that in practice it is possible for different tests to give contradicting conclusions. Choosing which test is more appropriate is not easy. The groups mean tests particular strength is that they are less restrictive. Regarding the best way to correct for autocorrelation, non parametric tests are likely to be more robust to outliers but have poor size properties and tend to over-reject the null when it is true. The ADF-type tests have better power if the errors follow an autoregressive process. Therefore, we followed from the other researcher that we report the adjusted values so that in all cases the reported test values can be compared to the standard normal distribution. This is the case for both the cointegration and unit root tests.

3.4.2 Fully Modified Ordinary Least Squares (FMOLS) Estimation

In this section we adopt FMOLS procedure from Christopoulos and Tsionas (2003, 2004). In order to obtain asymptotically efficient consistent estimates in panel series, non-exogeneity and serial correlation problems are tackled by employing fully modified OLS (FMOLS) introduced by Pedroni (1996). Since the explanatory variables are cointegrated with a time trend, and thus a long-run equilibrium relationship exists among these variables through the panel unit root test and panel cointegration test, we proceed to estimate the Equation (3.3) and Equation (3.4) by the method or fully modified OLS (FMOLS) for heterogenous cointegrated panels (Pedroni, 1996, 2000). This methodology allows consistent and efficient estimation of cointegration vector and also addresses the problem of non-stationary regressors, as well as the problem of simultaneity biases. It is well known that OLS estimation yields biased results because the regressors are endogenously determined in the *I*(1) case. The starting point OLS as in the following cointegrated system for panel data:

$$y_{it} = \alpha_i + x'_{it}\beta + e_{it} \tag{3.26}$$

$$x_{it} = x_{i,t-1} + \varepsilon_{it}$$

where $\xi_{it} = [e_{it}, \varepsilon'_{it}]$ is the stationary with covariance matrix Ω_i. The estimator β will be consistent when the error process $\omega_{it} + [e_{it}, \varepsilon'_{it}]'$ satisfies the assumption of cointegration between y_{it} and x_{it}. The limiting distribution of OLS estimator depends upon nuisance parameters. Following Phillips and Hansen (1990) a semi-parametric

correction can be made to the OLS estimator that eliminates the second order bias caused by the fact that the regressors are endogenous. Pedroni (1996, 2000) follows the same principle in the panel data context, and allows for the heterogeneity in the short run dynamics and the fixed effects. FMOLS Pedroni's estimator is constructed as follow:

$$\hat{\beta}_{FM} - \beta = \left(\sum_{i=1}^{N} \hat{\Omega}_{22i}^{-2} \sum_{t=1}^{T} (x_{it} - \hat{x}_t)^2 \right)^{-1} \sum_{i=1}^{N} \hat{\Omega}_{11i}^{-1} \hat{\Omega}_{22i}^{-1} \left(\sum_{t=1}^{T} (x_{it} - \bar{x}_t) e_{it}^* - T\hat{\gamma}_i \right) \qquad (3.27)$$

$$\hat{e}_{it}^* = e_{it} - \hat{\Omega}_{22i}^{-1} \hat{\Omega}_{21i}, \qquad \hat{\gamma}_i = \hat{\Gamma}_{21i} + \hat{\Omega}_{21i}^0 - \hat{\Omega}_{22i}^{-1} \hat{\Omega}_{21i} \left(\hat{\Gamma}_{22i} + \hat{\Omega}_{22i}^0 \right)$$

where the covariance matrix can be decomposed as $\Omega_i = \Omega_i^0 + \Gamma_i + \Gamma_i$ where Ω_i^0 is the contemporaneous covariance matrix, and Γ_i is a weighted sum of autocovariances. Also, $\hat{\Omega}_i^0$ denotes an appropriate estimator of Ω_i^0.

In this study, we employed both the within-dimension and between-dimension panel FMOLS test from Pedroni (1996, 2000). An important advantage of the between-dimension estimators is that the form in which the data is pooled allows for greater flexibility in the presence of heterogeneity of the cointegrating vectors. Specifically, whereas test statistics constructed from the within-dimension estimators are designed to test the null hypothesis $H_0 : \beta_i = \beta_0$ for all *I* against the alternative hypothesis $H_A : \beta_i = \beta_A \neq \beta_0$ where the value β_A is the same for all *i*, test statistics constructed from the between-dimension estimators are designed to test the null hypothesis $H_0 : \beta_i = \beta_0$ for all *i* against the alternative hypothesis $H_A : \beta_i \neq \beta_0$, so that the

values for β_i are not constrained to be the same under the alternative hypothesis. Clearly, this is an important advantage for applications such as the present one, because there is no reason to believe that, if the cointegrating slopes are not equal to one, which they necessarily take on some other arbitrary common value.

Another advantage of the between-dimension estimators is that the point estimates have a more useful interpretation in the event that the true cointegrating vectors are heterogeneous. Specifically, point estimates for the between-dimension estimator can be interpreted as the mean value for the cointegrating vectors. This is not true for the within-dimension estimators (Pedroni, 2001).

3.5 Data

The data used in this study is annually time series data from 1999 – 2008 .The period has been chosen based on availability of the annually data collected from Asian Development Bank (ADB) report 2009 and World Bank report. This study uses annually data total tax revenue, non-tax, productive expenditure, total expenditure, budget deficit, population growth, investment, government debt and external debt is measured by GDP per capita growth. After estimate the variable in real term, all variables are expressed by natural logarithms.

3.6 Conclusion

As the conclusion, in this study econometric procedure in this chapter was explained step by step in order to search out the relationship between fiscal variable and country characteristics on economic growth and the relationship between country and the independent variables. While in chapter 4, it will discuss the result and analysis to achieve the objective in this study.

CHAPTER 4

RESULTS AND ANALYSIS

4.0 Introduction

In this chapter, data collected for the study were analyzed. This chapter also examined whether all the fiscal variables and country characteristics are related to GDP per capita from 1999 to 2008. In addition, this chapter presents the results of the panel unit root tests, panel cointegration tests, and fully modified OLS tests (FMOLS). Finally, this chapter discusses the interpretation of the results based on the information in Chapter 3.

4.1 Results for Unit Root Tests

Maddala and Wu (1999) tests are based on the Fisher-Type test using ADF. The tests reject the null hypothesis of non-stationarity of data at the 5 percent significance level for all variables, fiscal or country characteristics variables. The null and alternative hypotheses are as follows:

H_0: variable is non stationary

H_0: variable is stationary

4.1.1 ADF - Fisher Chi-square Results for Fiscal Variable

Table 4.1 shows the ADF - Fisher Chi-square results for the fiscal variables. The results of the panel unit root tests in Table 4.1 determines whether the variables in the fiscal variable model reject or not reject the null hypothesis (H_0). The results indicate that all fiscal variables are non stationary at level value, therefore do not reject $H_{0.}$ This means that all the fiscal variables have unit roots at the level value. Subsequently, all the variables are tested further at first difference to determine whether they are stationary. When all the variables are tested at first difference using the ADF – Fisher Chi-square method, the results show the entire variables, GDPC, TTR, NT, PE, TE and BD reject the null hypothesis, $H_{0.}$ This means that all the fiscal variables are stationary at first difference and do not have unit roots.

Table 4.1: ADF - Fisher Chi-square Results for Fiscal Variables

Variable	LEVEL		1st DIFERRENCE	
	Individual intercept	Individual trend & intercept	Individual intercept	Individual trend & intercept
GDPC	4.99320 (0.8916)	1.85340 (0.9852)	26.1852 (0.0035)**	23.3735 (0.0029)**
TTR	5.41958 (0.8614)	7.90513 (0.6381)	28.7465 (0.0014)**	23.3952 (0.0094)**
NT	14.7397 (0.1418)	12.6746 (0.2424)	36.0126 (0.0001)**	35.0150 (0.0001)**
PE	0.93495 (0.9986)	4.93273 (0.7647)	15.8747 (0.0442)**	39.3744 (0.0000)**
TE	11.9121 (0.2910)	13.8487 (0.1800)	21.6664 (0.0169)**	17.3538 (0.0669)**
BD	13.5630 (0.1939)	15.1918 (0.1252)	23.5375 (0.0089)**	20.5306 (0.0246)**

Note: ** indicates the rejection of null hypothesis of non – stationary at 5% significant level, ( ) indicates the probability value

4.1.2 ADF - Fisher Chi-square Results for Country Characteristics

Table 4.2 shows the ADF - Fisher Chi-square results for county characteristics. The results of the panel unit root tests in Table 4.2 show whether the variables in the country characteristics model reject or do not reject the null hypothesis (H_0). The results indicate that all country characteristics variables are non stationary at level,

therefore the null hypothesis, H_0 is not rejected. This means that all the country characteristics variables have unit roots problem. Consequently, all the variables are tested for stationarity at first difference. When the variables are tested at first difference using the ADF – Fisher Chi-square method, the results show that the entire variables, GDPC, PG, I, GD and ED reject H_0. This means that all the country characteristics variables do not have unit roots at first difference.

Table 4.2: ADF - Fisher Chi-square Results for Country Characteristics

Variable	LEVEL		1st DIFERRENCE	
	Individual intercept	**Individual trend & intercept**	**Individual intercept**	**Individual trend & intercept**
GDPC	4.99320 (0.8916)	1.85340 (0.9852)	26.1852 (0.0035)**	23.3735 (0.0029)**
PG	14.0980 (0.1686)	9.27762 (0.5060)	28.6085 (0.0014)**	32.3599 (0.0003)**
I	5.60996 (0.8469)	1.21267 (0.9763)	14.6025 (0.0236)**	14.5490 (0.0241)**
GD	1.54341 (0.9988)	3.23202 (0.9754)	16.6932 (0.0814)**	17.7765 (0.0589)**
ED	2.49796 (0.9909)	1.19444 (0.8790)	9.23881 (0.0554)**	8.25096 (0.0828)**

Note: ** indicates the rejection of null hypothesis of non – stationary at 5% significant level, ( ) indicates the probability value

4.2 Results for Panel Cointegration Tests

In these tests, if the variables are integrated of order one, the panel cointegration using Pedroni (1999) test allows for heterogeneity in the intercepts and slopes of the cointegration equation. One group of the tests is panel tests for within dimension while the other group of tests are called between dimension test which stands for group test.

4.2.1 Results for Fiscal Variable and Country Characteristics

After determining the occurrence of unit roots in the variables, we proceed to the panel cointegration test to see the correlation among all the fiscal variables and among all the country characteristics variables. They are three test statistics that show the least evidence of rejecting the null hypothesis of no cointegration are the panel v-statistic and the panel and group rho-statistics. According to Pedroni (1999), the rho-statistics tend to under reject the null of no cointegration in small samples. Table 4.3 and 4.4 show the results from the Pedroni (1999) tests method, where there are seven test statistics under the null hypothesis of no cointegration. In these tests, the critical value at the 5 percent significance level is -1.645 as the residual based analysis is a one-tailed test. Therefore, large negative values or values in the left tail imply the rejection of the null hypothesis of no cointegration. One exception is the panel v-statistics that diverge to positive infinity or right tail, thus requiring large positive values or larger than 1.645 to reject the null hypothesis of no cointegration.

The critical values for the mean and variance of each statistics were obtained from Pedroni (1999). Thus it is reasonable to conclude that fiscal and country characteristics' variables are co integrated over the time period and this conclusion holds, irrespective of which variable is treated as the dependent variable.

From the tests' results in Table 4.3 and Table 4.4, we found that five out of seven variables are significant.

Table 4.3: Panel Cointegration Results for Fiscal Variable

TEST NAME	STATISTIC
Panel v-stat	-1.68300
Panel rho-stat	- 3.29002***
Panel pp-stat	-1.89054*
Panel adf-stat	-1.69050*
Group rho-stat	- 3.70695***
Group pp-stat	-6.03454***
Group adf-stat	-1.07774

Note: panel v is a non-parametric variance ratio statistic; panel p and the panel pp are analogous to the non-parametric Philips-Perron p and t-statistic, respectively panel ADF is the parametric statistic based on the Augmented Dickey-Fuller ADF statistic; group p and group pp are the non-parametric Philips-Perron p and t-statistic, and group ADF is the standard parametric ADF statistic.

Table 4.4: Panel Cointegration Results for Country Characteristics

TEST NAME	STATISTIC
Panel v-stat	3.06228
Panel rho-stat	- 3.85034***
Panel pp-stat	-4.92189***
Panel adf-stat	-5.04850***
Group rho-stat	- 3.50186***
Group pp-stat	-2.92373***
Group adf-stat	-1.26478

Note: panel v is a non-parametric variance ratio statistic; panel p and the panel pp are analogous to the non-parametric Philips-Perron p and t-statistic, respectively; panel ADF is the parametric statistic based on the Augmented Dickey-Fuller ADF statistic; group p and group pp are the non-parametric Philips-Perron p and t-statistic, and group ADF is the standard parametric ADF statistic.

4.3 Results for Fully Modified Ordinary Least Square (FMOLS)

The cointegrating equation for the country and the entire variables used in these tests are estimated by using the fully modified OLS estimation technique for heterogeneous cointegrated panels. This methodology allows for consistent and efficient estimation of cointegrating vectors. In the FMOLS tests, individual results and panel group results are defined. In individual results, we notice cointegration between independent variable and countries while in panel group we notice cointegration between independent variable, based on real GDPC as the dependent variable.

4.3.1 Individual FMOLS Results for Fiscal Variable

Table 4.5 shows the results for individual FMOLS for fiscal variables based on real GDP per capita as the dependent variable. In Thailand, total expenditure seems to be significant at the 5 percent significance level, while in Indonesia, Malaysia, the Philippines and Vietnam, total expenditure is significant at the 1 percent significance level. Furthermore, the results show that the coefficient for Indonesia is 0.21, while Malaysia, Philippines, Thailand and Vietnam have the same coefficient, 0.03. The results indicate that all ASEAN-5 countries have a positive effect in real GDP per capita (GDPC). However, the results obtained from the test do not have the expected signs as shown in Table 3.1. This occurred when the governments increase their total expenditure as a result of deliberate policy of stimulating industrialization to raise the overall level of economic activity and diversify the economy. This effect follows the Keynesian model where an increase in total expenditure, especially on infrastructures may lead to higher economic growth.

Meanwhile, Table 4.5 shows that in productive expenditure, only the Philippines show a negative effect of productive expenditure on GDPC, all other countries show positive impact of productive expenditure on GDPC. The results show that the coefficient for Indonesia is 0.03, Malaysia 0.01, the Philippines -0.03, Thailand 0.01, and Vietnam 0.01. The results also show that coefficients for the Philippines and Thailand are significant at the 5 percent confidence level while the coefficients for Indonesia, Malaysia and Vietnam are significant at the 1 percent significance level.

In Table 3.1, the expected sign for productive expenditure is positive but the results shown in Table 4.5 indicate that the Philippines show a negative relationship between productive expenditure and GDPC. The reason may be because the Philippines' economic performance is inferior compared to the other ASEAN-5 countries. One of the roles of productive expenditure is towards producing capital goods that will be used to produce other capital goods and / or consumer goods.

For non tax revenue, as shown in Table 4.5, the coefficient for Indonesia is 0.21, Malaysia 1.05, the Philippines 0.04, Thailand 0.11, and Vietnam -0.03. All results are significant at the 10 percent significance level. All countries with the exception of Vietnam exhibit positive relationship between non tax revenue and GDPC. This is because non tax revenue is an important source of government revenue. Therefore, strengthening non-tax management is essential since it improves the functions and objective of public finance. Mismanagement of government revenues will have a negative impact on the economy, as shown in the case of Vietnam.

Table 3.1 shows that the expected sign for total tax revenue is either positive or negative. From the results in Table 4.5, we can verify that only Thailand shows a negative impact of total tax revenue on GDPC, where the coefficient for the Thailand is -0.21. Meanwhile, the coefficient for Indonesia is 0.01, Malaysia 0.37, the Philippines 0.03, and lastly Vietnam 0.03. The results confirm that all these countries except for Thailand show positive relationship between total tax revenue GDPC. The results for Indonesia, the Philippines and Vietnam are significant at the 1 percent significance level while Thailand's is significant at the 5 percent level. However, the result for Malaysia is not significant at any level.

Finally, Table 4.5 shows that coefficients for budget deficit in Indonesia, Malaysia and Philippines are significant at the 1 percent significance level while Vietnam's is significant at the 5 percent significance level. However, coefficient for Thailand is not significant in determining GDPC. The results in Table 4.5 indicate that the coefficient for Malaysia is 0.15, Indonesia -0.05, the Philippines 0.07, Thailand 0.21, and Vietnam -0.20. Therefore, all countries, except for Indonesia and Vietnam show a negative relationship between budget deficit and GDPC. Riley (2006) stated that budget deficit can have positive macroeconomic effect in the long run if it is used to finance the extra capital spending that leads to an increase in the stock of national assets. For example, spending on transportation infrastructure improves the supply-side capacity of the economy. Also, increased investment in health and education can bring positive effects on productivity and employment.

Table 4.5: Individual FMOLS Results for Fiscal Variable; Dependent variable (real GDP per capita)

Country	Total Expenditure (TE)	Productive Expenditure (PE)	Non-Tax (NT)	Total Tax Revenues (TTR)	Budget Deficit (BD)
INDO	0.21*** (4.00)	0.03*** (3.61)	0.21*** (-5.26)	0.01*** (-4.45)	-0.05*** (3.54)
MAL	0.03*** (7.15)	0.01*** (6.86)	1.05*** (-6.19)	0.37 (-1.05)	0.15*** (-6.46)
PHILIP	0.03 (-1.29)	-0.03** (-2.10)	0.04*** (-6.09)	0.03*** (-4.89)	0.07*** (-6.98)
THAI	0.03** (-2.80)	0.01** (-2.53)	0.11*** (-5.97)	-0.21** (-2.71)	0.21 (-1.28)
VIET	0.03*** (11.44)	0.01*** (11.42)	-0.03*** (-5.55)	0.03*** (-9.33)	0.20***(-2.92)

Note: Figures in brackets are t-statistics. (***) ,(**) and (*) indicate statistical significant at the 1%, 5% and 10% level.

4.3.2 Panel Group FMOLS Results for Fiscal Variable

From the results of panel group for fiscal variables in Table 4.6, the coefficient for total expenditures is -0.08 and is significant at the 1 percent significance level. The result shows that total expenditures have a negative effect on GDPC. Meanwhile, the coefficient of productive expenditure is 0.04 and is significant at the 5 percent significance level. This means that productive expenditure also has a positive effect on GDPC. The non tax revenue has a positive effect on GDPC where coefficient is 0.24 at the 1 percent significance level. The coefficient of total tax revenues is 0.28 and is significant at the 1 percent significance level. Therefore, total tax revenues have positive effect on GDPC. As for budget deficit, the coefficient is 0.24 and significant at the 1 percent significance level, thus budget deficit has positive impact on GDPC. This result contradicts the expected sign shown in Table 3.1. This positive effect occurs because when there is an increase in GDPC, it does not mean the budget is in a surplus because the government still has to spend in various development projects. The government expenditure is possibly higher than the increase in GDPC, therefore, the increase in GDPC also increases the budget deficit.

Table 4.6: Panel Group FMOLS Results for Fiscal Variable; Dependentvariable (real GDP per capita)

Total Expenditure (TE)	Productive Expenditure (PE)	Non-Tax (NT)	Total Tax Revenues (TTR)	Budget Deficit (BD)
-0.08*** (-3.13)	0.04** (-2.03)	0.24***(7.34)	0.28*** (-4.21)	0.24*** (-8.04)

Note: Figures in brackets are t-statistics. (***), (**) and (*) indicate statistical significant at the 1%, 5% and 10% level

4.3.3 Individual FMOLS Results for Country Characteristics

Table 4.7 displays the results for individual FMOLS for country characteristics. The results indicate that external debt seems to be significant at the 1 percent significance level for all ASEAN-5 countries. Malaysia and the Philippines show a positive impact of external debts on GDPC with the coefficient for Malaysia is 0.04 and for the Philippines 0.01. On the other hand, external debt has a negative impact on GDPC in Indonesia, Thailand, and Vietnam, and with the coefficient for Indonesia at -0.02, Thailand -0.31, and Vietnam -0.31. In Table 3.2, the expected sign for external debt is positive. The contradictory results for Indonesia, Thailand, and Vietnam illustrate that external debt has a negative relationship with GDP per capita. Developing countries need to borrow a large sum, often at concessional interest rates. The governments expect these loans (external debt) would put their countries on a faster development path through higher investment and faster growth. However, after the ASEAN-5 faced severe financial difficulties during the financial crisis in 1997/98, their governments were forced to increase their external debt and as a result, external debt reached a very high level. For these countries, repayment of the external debt would not just constrain economic performance, but also virtually impossible.

Moreover, from the result of government debt in Table 4.7, we discover that Indonesia's result is significant at the 5 percent significance level whereas the other countries' results are significant at the 1 percent significance level. The coefficient for Indonesia is 0.05, Malaysia 0.12, the Philippines 0.04, Thailand 0.29, and

Vietnam 0.30. All the ASEAN-5 countries have a positive effect on GDPC as shown in Table 4.7 and have the same expected sign as in Table 3.2.

Next, Table 4.7 also reveals the impact of share of investment on GDPC. The coefficient for Indonesia is -0.03, Malaysia 0.22, Philippines -0.13, Thailand -0.11, and lastly Vietnam -0.08. All the ASEAN-5 countries have significant results at the 1 percent significance level except for the Philippines which has significant result at the 5 percent significance level. Moreover, the share of investment has a negative effect on GDPC in all countries except for Malaysia. After the financial crisis in 1997/98, many countries are forced to reduce their budget deficit, resulting in a decline in domestic investment, or an increase in private saving.

Finally, the results in Table 4.7 point out that population growth coefficient for Indonesia is -0.01, Malaysia 0.01, the Philippines -0.03, Thailand -0.04, and Vietnam -0.04. Therefore, all the ASEAN-5 countries have a negative effect on GDPC except for Malaysia which has a positive impact on GDPC, incidentally the same expected sign as in Table 3.2. In addition, the results for Malaysia and the Philippines are significant at the 1 percent significance level while for Indonesia and Thailand, the results are significant at the 5 percent level. However, for Vietnam, population growth is not significant on GDPC.

Table 4.7: Individual FMOLS Results for Country Characteristics; Dependent variable (real GDP per capita)

Country	External Debt (ED)	Government Debt (GD)	Investment (I)	Population Growth (PG)
INDO	-0.02*** (-7.18)	0.05** (-2.07)	-0.03*** (-3.74)	-0.01**(-2.49)
MAL	0.04*** (-6.64)	0.12*** (-5.86)	0.22*** (-5.38)	0.01*** (-6.96)
PHILIP	0.01*** (-3.57)	0.04*** (4.64)	-0.13** (-2.15)	-0.03*** (-3.00)
THAI	-0.31*** (-5.35)	0.29*** (-3.79)	-0.11*** (-5.66)	-0.04** (-2.73)
VIET	-0.31*** (-4.36)	0.30*** (-3.84)	-0.08*** (-4.11)	-0.04 (-1.75)

Note: Figures in brackets are t-statistics. (***) ,(**) and (*) indicate statistical significant at the 1%, 5% and 10% level.

4.3.4 Panel Group FMOLS Results for Country Characteristics

The panel group for country characteristics results in Table 4.8 show that external debt has a -0.21coefficient and is significant at the 1 percent significance level. From the results in Table 4.8, we find that external debt has a negative effect on GDPC which is contrary to the expected sign in Table 3.2 where external debt should have a positive effect on GDPC. The explanation behind this result is even though an increase in GDPC causes a rise in income, the governments do not have a large amount of money to pay the overall external debt. Meanwhile, government debt's coefficient is 0.14 and is significant at the 1 percent significance level. Therefore, it has a positive relationship with GDPC. Furthermore, share of investment has a positive effect on GDPC with the coefficient at 0.27 and is significant at the 1 percent significance level. Lastly, the coefficient of population growth is 0.01 which

shows population growth has a positive effect on GDPC. However, population growth is not significant for GDPC.

Table 4.8: Panel Group FMOLS Results for Country Characteristics; Dependent variable (real GDP per capita)

External Debt (ED)	Government Debt (GD)	Investment (I)	Population Growth (PG)
-0.21*** (-3.15)	0.14*** (-5.71)	0.27*** (-6.71)	0.01 (-1.63)

Note: Figures in brackets are t-statistics. (***), (**) and (*) indicate statistical significant at the 1%, 5% and 10% level.

4.4 Conclusion

The results of the Maddala & Wu (1999) tests show the characteristics of the data used in the tests. Meanwhile, in order to show the long run relationship among all variables, the Pedroni (1999) tests are used. Finally, to examine the cointegration between the ASEAN-5 countries and all variables, FMOLS are used. The results show that every variable is significant in all tests.

CHAPTER 5

CONCLUSION AND POLICIES IMPLICATION

5.0 Conclusion

As a conclusion, in this study we used ten variables where GDPC became as dependent variables to determine fiscal deficit in ASEAN-5 countries. Then the other variables that we used became independent variables which divided by two categories; i.e. fiscal variable and country characteristics. For fiscal variable, we include total tax revenue (TTR), non tax (NT), productive expenditure (PE), total expenditure (TE) and budget deficit (BD). Whereas for country characteristics, we consider population growth (PG), investment (I), government debt (GD) and external debt (ED) as the variables in this model.

In Maddala and Wu (1999), model based on ADF Fisher Chi Square test results find that all variables are not significant at level then it became significant at first difference or non stationary when it was observed. This indicates that in this test, it does not have unit root test, and all variables have interaction to each other. The results are as proved by Table 4.1 and Table 4.2.

Furthermore, in Peddroni (1999), test also proved that all variables are significant and it showed by Table 4.3 and Table 4.4. It explains that there are cointegration relations between the variables.

Meanwhile the result of FMOLS test in Table 4.5 and 4.7 figures that there were interaction between dependent variable and independent variables. In addition, for the result of FMOLS test in Table 4.6 and Table 4.8, they also highlighted the relationship between ASEAN -5 countries and the variables that we used in this test.

Lastly, all of the independent variables should be given an equal attention, perhaps, it would have an effect on the fiscal deficit in the ASEAN-5 countries for the purpose to recognize and implement the best policy that can be adapted by government based on this significant analysis.

As conclusion, we prove that the objectives that we had stated before regarding the relationship between country characteristic and economic growth and also between fiscal variable and economic growth in ASEAN-5 countries was achieved, it can be shown by analysis that has been done in chapter four.

5.1 Policy Implications

Fiscal deficit is one of the problems that faced by all countries including ASEAN countries. Fiscal deficit that could be faced by any countries would trigger significant problem in the countries, it worsen the budget of that countries. When deficit occurred, it causes constraints in development and reduction in expenditure, and leading to a decreasing total expenditure. There are many ways that could be suggested to solve the deficit problem, either by using the tools of fiscal or monetary policies.

Fiscal policy is the combination of the practices of government with respect to revenue, expenditures and also debt management. In this policy, it also provides the guidance for public in the planning of expenditure, revenues and funding management for the public services. Besides that, it provides a framework within which budget, tax and fee decisions should be made by government. For example, through changes in taxes rates, it is possible for the government to properly increase the demand and the level of economic activity, also the distribution of income and the resources. Besides that, fiscal policy also refers to the effects of the outcome of a budget on the activities of the economy. As a result, when government is in budget deficit, they will use fiscal contractionary, where, the level of taxation is greater than government spending. It can be done by increasing taxation and leaving spending at the same time or reducing the spending. As the result, it may lead to a surplus of government budget.

Besides the increasing of taxation, government also can implement the seigniorage policy, which refer to the action of government that printing money, and also other policy such as borrowing the money from the population to generate development and investment. When the deficit must be financed through fiscal policy, it is usually done through the issuance of bonds, bills and securities. It is because the payment from the interest rate that been charged allow the government to collect money for fixed period to pay for the deficit. But, if in the case when government borrows money and could not afford to paid, there would be foreign loans in the country.

Other than that, when monetary financing high fiscal deficit and government borrowing at the below market, it caused interest rate to affect the function of monetary policy and lead inflationary pressure on the economy. If the economy is in high inflation, government will used contractionary monetary policy[1] by increasing the interest rate. When deficit happened, the expansionary policy may be applied by government to reduce the interest rate and to off-set the high unemployment rate. Meanwhile, for monetary policy, the open market operation was the most often used tool by government. In open market operation, government able to organize the money supply of the country for buying and selling treasury bills, foreign currencies and company bonds.

[1] Contractionary monetary policy is a government policy of raising interest rates that change by the \ central bank to keep inflation on track.

Finally, without central bank and monetary policy, there is no approach that can be employed to manage deficit and then it could lead economy to turn into depression and caused inflation to out of control. Meanwhile, fiscal policy is very important to help country to get out from recession and also help the country to continue operating even at deficit point. As conclusion, when fiscal policies are combined with monetary policies, it keeps the country's economy to keep moving forward and beneficial for everyone.

5.2 Recommendation for Future Studies

For the future research we would like to recommend to including other countries for the study and also if necessary, additional period of study also can be stretched, so we can obtain a better result. Other than that, it is recommended to include more suitable variables to be added into the model such as on welfare, import and export, interest rate and savings.

The welfare variable can be used in this research because it can be used as the country's economic index and also as the indicator in economy. This is true because if the country's shows a high welfare standard or ability, it indicates that the country's economy is at a deficit level. The government has to spend a lot of its income on welfare. This will cause inflation, and lead the government to charge a high tax rate and also the price of commodity will not be at a stable state. Thus, at the end of the day, the people's welfare of the country will be decreased.

Secondly, foreign exchanges also can be used to study fiscal deficit of a nation. The exchange rate, either high or low compare with other nations will show whether the economy of the nation become stable or deteriorates. Meanwhile, the increase in export and import also plays an important role in the changes of budget deficit, because it can determines the level of income of the country.

Similarly, the interest rates set by banks also can be used as one of the determinant to determine the fiscal deficit. If banks set high interest rate, more customers will save their money, this will cause more money cannot be utilized for economic development. Customers also are reluctant to withdraw their money and fewer customers will ask for bank loan. These factors will caused less money for investment and can lead to economic deficit in the country.

Lastly, variable savings can also affect the country's economy. The value of high saving in a country could lead to less projects and investments by the government. This indicates that government needed to slow their development program and, finally, the outcomes could be seen in terms of the fiscal deficit of the country.

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APPENDIX

APPENDIX 1

ASEAN-5 Economies; General Government fiscal deficit

COUNTRY / YEARS	INDONESIA	MALAYSIA	PHILIPPINES	THAILAND	VIETNAM
1999	-2.5	-3.2	-3.8	-9.9	-3.3
2000	-1.1	-5.5	-4.0	-2.8	-4.3
2001	-2.4	-5.2	-4.0	-2.7	-3.5
2002	-1.5	-5.3	-5.3	-8.1	-2.3
2003	-1.7	-5.0	-4.6	0.1	-2.2
2004	-1.0	-4.1	-3.8	-0.4	0.2
2005	-0.5	-3.6	-2.7	0.1	-1.1
2006	-0.9	-3.3	-1.1	-0.3	1.3
2007	-1.2	-3.2	-0.2	-1.3	-3.1
2008	-0.1	-4.8	-0.9	-0.4	-2.0

Source : Key Indicators for Asia and the Pacific 2009 (ADB,2009)

APPENDIX 2

ADF – Results for Fiscal Variable (GDPC) at Level (Individual intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/26/10 Time: 22:54
Sample: 1999 2008
Series: GDPC_INDON, GDPC_MALAY, GDPC_PHILIP, GDPC_THAI, GDPC_VIET
Exogenous variables: Individual effects
User specified lags at: 0
Total (balanced) observations: 45
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	4.99320	0.8916
ADF - Choi Z-stat	1.40788	0.9204

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results GDPC?

Series	Prob.	Lag	Max Lag	Obs
GDPC_INDON	0.4088	0	1	9
GDPC_MALAY	0.3467	0	1	9
GDPC_PHILIP	0.8493	0	1	9
GDPC_THAI	0.6930	0	1	9
GDPC_VIET	0.9873	0	1	9

APPENDIX 3

ADF – Results for Fiscal Variable (TTR) at Level (Individual intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/26/10 Time: 23:00
Sample: 1999 2008
Series: TTR_INDON, TTR_MALAY, TTR_PHILIP, TTR_THAI, TTR_VIET
Exogenous variables: Individual effects
User specified lags at: 0
Total (balanced) observations: 45
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	5.41958	0.8614
ADF - Choi Z-stat	1.99529	0.9770

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results TTR?

Series	Prob.	Lag	Max Lag	Obs
TTR_INDON	0.9366	0	1	9
TTR_MALAY	0.8924	0	1	9
TTR_PHILIP	0.9971	0	1	9
TTR_THAI	0.1817	0	1	9
TTR_VIET	0.4395	0	1	9

APPENDIX 4

ADF – Results for Fiscal Variable (NT) at Level (Individual intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/26/10 Time: 23:01
Sample: 1999 2008
Series: NT_INDON, NT_MALAY, NT_PHILIP, NT_THAI, NT_VIET
Exogenous variables: Individual effects
User specified lags at: 0
Total (balanced) observations: 45
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	14.7397	0.1418
ADF - Choi Z-stat	0.06814	0.5272

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results NT?

Series	Prob.	Lag	Max Lag	Obs
NT_INDON	0.9741	0	1	9
NT_MALAY	0.8245	0	1	9
NT_PHILIP	0.2497	0	1	9
NT_THAI	0.0044	0	1	9
NT_VIET	0.7160	0	1	9

APPENDIX 5

ADF – Results for Fiscal Variable (PE) at Level (Individual intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/26/10 Time: 23:02
Sample: 1999 2008
Series: PE_INDON, PE_MALAY, PE_PHILIP, PE_THAI, PE_VIET
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic selection of lags based on AIC: 0
Total (balanced) observations: 36
Cross-sections included: 4 (1 dropped)

Method	Statistic	Prob.**
ADF - Fisher Chi-square	0.93495	0.9986
ADF - Choi Z-stat	3.71054	0.9999

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results PE?

Series	Prob.	Lag	Max Lag	Obs
PE_INDON	0.6872	0	1	9
PE_MALAY	0.9806	0	1	9
PE_PHILIP	0.9997	0	1	9
PE_THAI	0.9301	0	1	9
PE_VIET	Dropped from Test			

APPENDIX 6

ADF – Results for Fiscal Variable (TE) at Level (Individual intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/26/10 Time: 23:03
Sample: 1999 2008
Series: TE_INDON, TE_MALAY, TE_PHILIP, TE_THAI, TE_VIET
Exogenous variables: Individual effects
User specified lags at: 1
Total (balanced) observations: 40
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	11.9121	0.2910
ADF - Choi Z-stat	-0.12299	0.4511

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results TE?

Series	Prob.	Lag	Max Lag	Obs
TE_INDON	0.2066	1	1	8
TE_MALAY	0.0379	1	1	8
TE_PHILIP	0.5582	1	1	8
TE_THAI	0.6111	1	1	8
TE_VIET	0.9707	1	1	8

APPENDIX 7

ADF – Results for Fiscal Variable (BD) at Level (Individual intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/26/10 Time: 23:04
Sample: 1999 2008
Series: BD_INDON, BD_MALAY, BD_PHILIP, BD_THAI, BD_VIET
Exogenous variables: Individual effects
User specified lags at: 0
Total (balanced) observations: 45
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	13.5630	0.1939
ADF - Choi Z-stat	-0.99101	0.1608

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results BD?

Series	Prob.	Lag	Max Lag	Obs
BD_INDON	0.6982	0	1	9
BD_MALAY	0.2671	0	1	9
BD_PHILIP	0.6816	0	1	9
BD_THAI	0.0558	0	1	9
BD_VIET	0.1600	0	1	9

APPENDIX 8

ADF – Results for Fiscal Variable (GDPC) at Level (Individual trend & intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/27/10 Time: 00:21
Sample: 1999 2008
Series: GDPC_INDON, GDPC_MALAY, GDPC_PHILIP, GDPC_THAI, GDPC_VIET
Exogenous variables: Individual effects, individual linear trends
User specified lags at: 0
Total (balanced) observations: 36
Cross-sections included: 4 (1 dropped)

Method	Statistic	Prob.**
ADF - Fisher Chi-square	1.85340	0.9852
ADF - Choi Z-stat	1.87573	0.9697

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results GDPC?

Series	Prob.	Lag	Max Lag	Obs
GDPC_INDON	0.6644	0	1	9
GDPC_MALAY	0.7871	0	1	9
GDPC_PHILIP	0.7905	0	1	9
GDPC_THAI	0.9575	0	1	9
GDPC_VIET		Dropped from Test		

APPENDIX 9

ADF – Results for Fiscal Variable (TTR) at Level (Individual trend & intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/27/10 Time: 00:22
Sample: 1999 2008
Series: TTR_INDON, TTR_MALAY, TTR_PHILIP, TTR_THAI, TTR_VIET
Exogenous variables: Individual effects, individual linear trends
User specified lags at: 0
Total (balanced) observations: 45
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	7.90513	0.6381
ADF - Choi Z-stat	0.64322	0.7400

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results TTR?

Series	Prob.	Lag	Max Lag	Obs
TTR_INDON	0.1834	0	1	9
TTR_MALAY	0.3628	0	1	9
TTR_PHILIP	0.8128	0	1	9
TTR_THAI	0.3606	0	1	9
TTR_VIET	0.9846	0	1	9

APPENDIX 10

ADF – Results for Fiscal Variable (NT) at Level (Individual trend & intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/27/10 Time: 00:23
Sample: 1999 2008
Series: NT_INDON, NT_MALAY, NT_PHILIP, NT_THAI, NT_VIET
Exogenous variables: Individual effects, individual linear trends
User specified lags at: 0
Total (balanced) observations: 45
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	12.6746	0.2424
ADF - Choi Z-stat	-0.08070	0.4678

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results NT?

Series	Prob.	Lag	Max Lag	Obs
NT_INDON	0.7308	0	1	9
NT_MALAY	0.0681	0	1	9
NT_PHILIP	0.7677	0	1	9
NT_THAI	0.0489	0	1	9
NT_VIET	0.9473	0	1	9

APPENDIX 11

ADF – Results for Fiscal Variable (PE) at Level (Individual trend & intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/27/10 Time: 00:23
Sample: 1999 2008
Series: PE_INDON, PE_MALAY, PE_PHILIP, PE_THAI, PE_VIET
Exogenous variables: Individual effects, individual linear trends
User specified lags at: 0
Total (balanced) observations: 36
Cross-sections included: 4 (1 dropped)

Method	Statistic	Prob.**
ADF - Fisher Chi-square	4.93273	0.7647
ADF - Choi Z-stat	0.57989	0.7190

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results PE?

Series	Prob.	Lag	Max Lag	Obs
PE_INDON	0.4291	0	1	9
PE_MALAY	0.7969	0	1	9
PE_PHILIP	0.8556	0	1	9
PE_THAI	0.2901	0	1	9
PE_VIET		Dropped from Test		

APPENDIX 12

ADF – Results for Fiscal Variable (TE) at Level (Individual trend & intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/27/10 Time: 00:24
Sample: 1999 2008
Series: TE_INDON, TE_MALAY, TE_PHILIP, TE_THAI, TE_VIET
Exogenous variables: Individual effects, individual linear trends
User specified lags at: 1
Total (balanced) observations: 40
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	13.8487	0.1800
ADF - Choi Z-stat	-0.55519	0.2894

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results TE?

Series	Prob.	Lag	Max Lag	Obs
TE_INDON	0.2006	1	1	8
TE_MALAY	0.0314	1	1	8
TE_PHILIP	0.2191	1	1	8
TE_THAI	0.9362	1	1	8
TE_VIET	0.7612	1	1	8

APPENDIX 13

ADF – Results for Fiscal Variable (BD) at Level (Individual trend & intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/27/10 Time: 00:25
Sample: 1999 2008
Series: BD_INDON, BD_MALAY, BD_PHILIP, BD_THAI, BD_VIET
Exogenous variables: Individual effects, individual linear trends
User specified lags at: 1
Total (balanced) observations: 40
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	15.1918	0.1252
ADF - Choi Z-stat	-0.04925	0.4804

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results BD?

Series	Prob.	Lag	Max Lag	Obs
BD_INDON	0.1871	1	1	8
BD_MALAY	0.9838	1	1	8
BD_PHILIP	0.9111	1	1	8
BD_THAI	0.3865	1	1	8
BD_VIET	0.0078	1	1	8

APPENDIX 14

ADF – Results for Fiscal Variable (GDPC) at 1st differences (Individual intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/26/10 Time: 14:06
Sample: 1999 2008
Series: GDPC_INDON, GDPC_MALAY, GDPC_PHILIP, GDPC_THAI, GDPC_VIET
Exogenous variables: None
Automatic selection of maximum lags
Automatic selection of lags based on AIC: 0 to 1
Total number of observations: 38
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	26.1852	0.0035
ADF - Choi Z-stat	-2.79325	0.0026

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(GDPC?)

Series	Prob.	Lag	Max Lag	Obs
D(GDPC_INDON)	0.0099	1	1	7
D(GDPC_MALAY)	0.0076	0	1	8
D(GDPC_PHILIP)	0.1899	0	1	8
D(GDPC_THAI)	0.3477	0	1	8
D(GDPC_VIET)	0.4130	1	1	7

APPENDIX 15

ADF – Results for Fiscal Variable (TTR) at 1st differences (Individual intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/27/10 Time: 00:30
Sample: 1999 2008
Series: TTR_INDON, TTR_MALAY, TTR_PHILIP, TTR_THAI, TTR_VIET
Exogenous variables: Individual effects
User specified lags at: 0
Total (balanced) observations: 40
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	28.7465	0.0014
ADF - Choi Z-stat	-2.76518	0.0028

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(TTR?)

Series	Prob.	Lag	Max Lag	Obs
D(TTR_INDON)	0.0067	0	1	8
D(TTR_MALAY)	0.0664	0	1	8
D(TTR_PHILIP)	0.3788	0	1	8
D(TTR_THAI)	0.0044	0	1	8
D(TTR_VIET)	0.7635	0	1	8

APPENDIX 16

ADF – Results for Fiscal Variable (NT) at 1st differences (Individual intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/27/10 Time: 00:31
Sample: 1999 2008
Series: NT_INDON, NT_MALAY, NT_PHILIP, NT_THAI, NT_VIET
Exogenous variables: Individual effects
User specified lags at: 0
Total (balanced) observations: 40
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	36.0126	0.0001
ADF - Choi Z-stat	-3.74114	0.0001

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(NT?)

Series	Prob.	Lag	Max Lag	Obs
D(NT_INDON)	0.0372	0	1	8
D(NT_MALAY)	0.0141	0	1	8
D(NT_PHILIP)	0.0708	0	1	8
D(NT_THAI)	0.0007	0	1	8
D(NT_VIET)	0.6155	0	1	8

APPENDIX 17

ADF – Results for Fiscal Variable (PE) at 1st differences (Individual intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/27/10 Time: 00:31
Sample: 1999 2008
Series: PE_INDON, PE_MALAY, PE_PHILIP, PE_THAI, PE_VIET
Exogenous variables: Individual effects
User specified lags at: 0
Total (balanced) observations: 32
Cross-sections included: 4 (1 dropped)

Method	Statistic	Prob.**
ADF - Fisher Chi-square	15.8747	0.0442
ADF - Choi Z-stat	-1.99044	0.0233

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(PE?)

Series	Prob.	Lag	Max Lag	Obs
D(PE_INDON)	0.0414	0	1	8
D(PE_MALAY)	0.2458	0	1	8
D(PE_PHILIP)	0.4394	0	1	8
D(PE_THAI)	0.0798	0	1	8
D(PE_VIET)		Dropped from Test		

APPENDIX 18

ADF – Results for Fiscal Variable (TE) at 1st differences (Individual intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/27/10 Time: 00:33
Sample: 1999 2008
Series: TE_INDON, TE_MALAY, TE_PHILIP, TE_THAI, TE_VIET
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic selection of lags based on AIC: 0 to 1
Total number of observations: 37
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	21.6664	0.0169
ADF - Choi Z-stat	-2.59647	0.0047

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(TE?)

Series	Prob.	Lag	Max Lag	Obs
D(TE_INDON)	0.0298	1	1	7
D(TE_MALAY)	0.1505	0	1	8
D(TE_PHILIP)	0.2312	1	1	7
D(TE_THAI)	0.1976	1	1	7
D(TE_VIET)	0.0964	0	1	8

APPENDIX 19

ADF – Results for Fiscal Variable (BD) at 1st differences (Individual intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/27/10 Time: 00:34
Sample: 1999 2008
Series: BD_INDON, BD_MALAY, BD_PHILIP, BD_THAI, BD_VIET
Exogenous variables: Individual effects
User specified lags at: 1
Total (balanced) observations: 35
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	23.5375	0.0089
ADF - Choi Z-stat	-1.84478	0.0325

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(BD?)

Series	Prob.	Lag	Max Lag	Obs
D(BD_INDON)	0.0904	1	1	7
D(BD_MALAY)	0.9263	1	1	7
D(BD_PHILIP)	0.5532	1	1	7
D(BD_THAI)	0.0459	1	1	7
D(BD_VIET)	0.0036	1	1	7

APPENDIX 20

ADF – Results for Fiscal Variable (GDPC) at 1st difference (Individual trend & intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/27/10 Time: 00:37
Sample: 1999 2008
Series: GDPC_INDON, GDPC_MALAY, GDPC_PHILIP, GDPC_THAI, GDPC_VIET
Exogenous variables: Individual effects, individual linear trends
User specified lags at: 2
Total (balanced) observations: 24
Cross-sections included: 4 (1 dropped)

Method	Statistic	Prob.**
ADF - Fisher Chi-square	23.3735	0.0029
ADF - Choi Z-stat	-1.55767	0.0597

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(GDPC?)

Series	Prob.	Lag	Max Lag	Obs
D(GDPC_INDON)	0.8837	2	2	6
D(GDPC_MALAY)	0.1374	2	2	6
D(GDPC_PHILIP)	0.0001	2	2	6
D(GDPC_THAI)	0.6922	2	2	6
D(GDPC_VIET)		Dropped from Test		

APPENDIX 21

ADF – Results for Fiscal Variable (TTR) at 1st difference (Individual trend & intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/27/10 Time: 00:38
Sample: 1999 2008
Series: TTR_INDON, TTR_MALAY, TTR_PHILIP, TTR_THAI, TTR_VIET
Exogenous variables: Individual effects, individual linear trends
User specified lags at: 0
Total (balanced) observations: 40
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	23.3952	0.0094
ADF - Choi Z-stat	-1.97447	0.0242

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(TTR?)

Series	Prob.	Lag	Max Lag	Obs
D(TTR_INDON)	0.0318	0	1	8
D(TTR_MALAY)	0.2214	0	1	8
D(TTR_PHILIP)	0.4733	0	1	8
D(TTR_THAI)	0.0029	0	1	8
D(TTR_VIET)	0.8481	0	1	8

APPENDIX 22

ADF – Results for Fiscal Variable (NT) at 1st difference (Individual trend & intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/27/10 Time: 00:39
Sample: 1999 2008
Series: NT_INDON, NT_MALAY, NT_PHILIP, NT_THAI, NT_VIET
Exogenous variables: Individual effects, individual linear trends
User specified lags at: 0
Total (balanced) observations: 40
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	35.0150	0.0001
ADF - Choi Z-stat	-3.71763	0.0001

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(NT?)

Series	Prob.	Lag	Max Lag	Obs
D(NT_INDON)	0.0513	0	1	8
D(NT_MALAY)	0.0714	0	1	8
D(NT_PHILIP)	0.0068	0	1	8
D(NT_THAI)	0.0018	0	1	8
D(NT_VIET)	0.5677	0	1	8

APPENDIX 23

ADF – Results for Fiscal Variable (PE) at 1st difference (Individual trend & intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/27/10 Time: 00:43
Sample: 1999 2008
Series: PE_INDON, PE_MALAY, PE_PHILIP, PE_THAI, PE_VIET
Exogenous variables: Individual effects, individual linear trends
User specified lags at: 2
Total (balanced) observations: 24
Cross-sections included: 4 (1 dropped)

Method	Statistic	Prob.**
ADF - Fisher Chi-square	39.3744	0.0000
ADF - Choi Z-stat	-4.06638	0.0000

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(PE?)

Series	Prob.	Lag	Max Lag	Obs
D(PE_INDON)	0.0164	2	2	6
D(PE_MALAY)	0.7144	2	2	6
D(PE_PHILIP)	0.0002	2	2	6
D(PE_THAI)	0.0015	2	2	6
D(PE_VIET)	Dropped from Test			

APPENDIX 24

ADF – Results for Fiscal Variable (TE) at 1st difference (Individual trend & intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/27/10 Time: 00:40
Sample: 1999 2008
Series: TE_INDON, TE_MALAY, TE_PHILIP, TE_THAI, TE_VIET
Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic selection of lags based on AIC: 0 to 1
Total number of observations: 37
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	17.3538	0.0669
ADF - Choi Z-stat	-1.73491	0.0414

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(TE?)

Series	Prob.	Lag	Max Lag	Obs
D(TE_INDON)	0.1409	1	1	7
D(TE_MALAY)	0.2826	0	1	8
D(TE_PHILIP)	0.6415	1	1	7
D(TE_THAI)	0.0256	1	1	7
D(TE_VIET)	0.2611	0	1	8

APPENDIX 25

ADF – Results for Fiscal Variable (BD) at 1st difference (Individual trend & intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/27/10 Time: 00:44
Sample: 1999 2008
Series: BD_INDON, BD_MALAY, BD_PHILIP, BD_THAI, BD_VIET
Exogenous variables: Individual effects, individual linear trends
User specified lags at: 0
Total (balanced) observations: 40
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	20.5306	0.0246
ADF - Choi Z-stat	-2.00824	0.0223

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(BD?)

Series	Prob.	Lag	Max Lag	Obs
D(BD_INDON)	0.3301	0	1	8
D(BD_MALAY)	0.6553	0	1	8
D(BD_PHILIP)	0.1956	0	1	8
D(BD_THAI)	0.0057	0	1	8
D(BD_VIET)	0.1434	0	1	8

APPENDIX 26

ADF – Results for Country Characteristics (GDPC) at Level (Individual intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/26/10 Time: 21:17
Sample: 1999 2008
Series: GDPC_INDON, GDPC_MALAY, GDPC_PHILIP, GDPC_THAI, GDPC_VIET
Exogenous variables: Individual effects
User specified lags at: 0
Total (balanced) observations: 45
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	4.99320	0.8916
ADF - Choi Z-stat	1.40788	0.9204

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results GDPC?

Series	Prob.	Lag	Max Lag	Obs
GDPC_INDON	0.4088	0	1	9
GDPC_MALAY	0.3467	0	1	9
GDPC_PHILIP	0.8493	0	1	9
GDPC_THAI	0.6930	0	1	9
GDPC_VIET	0.9873	0	1	9

APPENDIX 27

ADF – Results for Country Characteristics (PG) at Level (Individual intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/26/10 Time: 21:18
Sample: 1999 2008
Series: PG_INDON, PG_MALAY, PG_PHILIP, PG_THAI, PG_VIET
Exogenous variables: Individual effects
User specified lags at: 0
Total (balanced) observations: 45
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	14.0980	0.1686
ADF - Choi Z-stat	-1.43943	0.0750

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results PG?

Series	Prob.	Lag	Max Lag	Obs
PG_INDON	0.1144	0	1	9
PG_MALAY	0.2145	0	1	9
PG_PHILIP	0.1976	0	1	9
PG_THAI	0.4793	0	1	9
PG_VIET	0.3737	0	1	9

APPENDIX 28

ADF – Results for Country Characteristics (I) at Level (Individual intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/26/10 Time: 21:19
Sample: 1999 2008
Series: I_INDON, I_MALAY, I_PHILIP, I_THAI, I_VIET
Exogenous variables: Individual effects
User specified lags at: 0
Total (balanced) observations: 45
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	5.60996	0.8469
ADF - Choi Z-stat	1.04974	0.8531

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results I?

Series	Prob.	Lag	Max Lag	Obs
I_INDON	0.8542	0	1	9
I_MALAY	0.8358	0	1	9
I_PHILIP	0.8831	0	1	9
I_THAI	0.4960	0	1	9
I_VIET	0.1935	0	1	9

APPENDIX 29

ADF – Results for Country Characteristics (GD) at Level (Individual intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/26/10 Time: 21:21
Sample: 1999 2008
Series: GD_INDON, GD_MALAY, GD_PHILIP, GD_THAI, GD_VIET
Exogenous variables: Individual effects
User specified lags at: 0
Total (balanced) observations: 45
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	1.54341	0.9988
ADF - Choi Z-stat	2.48684	0.9936

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results GD?

Series	Prob.	Lag	Max Lag	Obs
GD_INDON	0.8171	0	1	9
GD_MALAY	0.8271	0	1	9
GD_PHILIP	0.8760	0	1	9
GD_THAI	0.8231	0	1	9
GD_VIET	0.9486	0	1	9

APPENDIX 30

ADF – Results for Country Characteristics (ED) at Level (Individual intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/26/10 Time: 21:23
Sample: 1999 2008
Series: ED_INDON, ED_MALAY, ED_PHILIP, ED_THAI, ED_VIET
Exogenous variables: Individual effects
User specified lags at: 0
Total (balanced) observations: 45
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	2.49796	0.9909
ADF - Choi Z-stat	3.54194	0.9998

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results ED?

Series	Prob.	Lag	Max Lag	Obs
ED_INDON	0.4566	0	1	9
ED_MALAY	0.6504	0	1	9
ED_PHILIP	0.9701	0	1	9
ED_THAI	0.9989	0	1	9
ED_VIET	0.9966	0	1	9

APPENDIX 31

ADF – Results for Country Characteristics (GDPC) at Level (Individual trend & intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/26/10 Time: 00:43
Sample: 1999 2008
Series: GDPC_INDON, GDPC_MALAY, GDPC_PHILIP, GDPC_THAI, GDPC_VIET
Exogenous variables: Individual effects, individual linear trends
User specified lags at: 0
Total (balanced) observations: 36
Cross-sections included: 4 (1 dropped)

Method	Statistic	Prob.**
ADF - Fisher Chi-square	1.85340	0.9852
ADF - Choi Z-stat	1.87573	0.9697

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results GDPC?

Series	Prob.	Lag	Max Lag	Obs
GDPC_INDON	0.6644	0	1	9
GDPC_MALAY	0.7871	0	1	9
GDPC_PHILIP	0.7905	0	1	9
GDPC_THAI	0.9575	0	1	9
GDPC_VIET		Dropped from Test		

APPENDIX 32

ADF – Results for Country Characteristics (PG) at Level (Individual trend & intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/26/10 Time: 00:44
Sample: 1999 2008
Series: PG_INDON, PG_MALAY, PG_PHILIP, PG_THAI, PG_VIET
Exogenous variables: Individual effects, individual linear trends
User specified lags at: 0
Total (balanced) observations: 45
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	9.27762	0.5060
ADF - Choi Z-stat	-0.08582	0.4658

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results PG?

Series	Prob.	Lag	Max Lag	Obs
PG_INDON	0.3166	0	1	9
PG_MALAY	0.6262	0	1	9
PG_PHILIP	0.1208	0	1	9
PG_THAI	0.8959	0	1	9
PG_VIET	0.4508	0	1	9

APPENDIX 33

ADF – Results for Country Characteristics (I) at Level (Individual trend & intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/26/10 Time: 00:44
Sample: 1999 2008
Series: I_INDON, I_MALAY, I_PHILIP, I_THAI, I_VIET
Exogenous variables: Individual effects, individual linear trends
User specified lags at: 0
Total (balanced) observations: 27
Cross-sections included: 3 (2 dropped)

Method	Statistic	Prob.**
ADF - Fisher Chi-square	1.21267	0.9763
ADF - Choi Z-stat	1.56976	0.9418

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results I?

Series	Prob.	Lag	Max Lag	Obs
I_INDON	0.8289	0	1	9
I_MALAY	0.8286	0	1	9
I_PHILIP	0.7940	0	1	9
I_THAI		Dropped from Test		
I_VIET		Dropped from Test		

APPENDIX 34

ADF – Results for Country Characteristics (GD) at Level (Individual trend & intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/26/10 Time: 00:45
Sample: 1999 2008
Series: GD_INDON, GD_MALAY, GD_PHILIP, GD_THAI, GD_VIET
Exogenous variables: Individual effects, individual linear trends
User specified lags at: 0
Total (balanced) observations: 45
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	3.23202	0.9754
ADF - Choi Z-stat	1.42445	0.9228

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results GD?

Series	Prob.	Lag	Max Lag	Obs
GD_INDON	0.6416	0	1	9
GD_MALAY	0.8398	0	1	9
GD_PHILIP	0.7965	0	1	9
GD_THAI	0.5987	0	1	9
GD_VIET	0.7732	0	1	9

APPENDIX 35

ADF – Results for Country Characteristics (ED) at Level (Individual trend & intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/26/10 Time: 00:43
Sample: 1999 2008
Series: ED_INDON, ED_MALAY, ED_PHILIP, ED_THAI, ED_VIET
Exogenous variables: Individual effects, individual linear trends
User specified lags at: 0
Total (balanced) observations: 18
Cross-sections included: 2 (3 dropped)

Method	Statistic	Prob.**
ADF - Fisher Chi-square	1.19444	0.8790
ADF - Choi Z-stat	0.93046	0.8239

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results ED?

Series	Prob.	Lag	Max Lag	Obs
ED_INDON	0.7840	0	1	9
ED_MALAY	0.7019	0	1	9
ED_PHILIP		Dropped from Test		
ED_THAI		Dropped from Test		
ED_VIET		Dropped from Test		

APPENDIX 36

ADF – Results for Country Characteristics (GDPC) at 1st difference (Individual intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/26/10 Time: 14:19
Sample: 1999 2008
Series: GDPC_INDON, GDPC_MALAY, GDPC_PHILIP, GDPC_THAI, GDPC_VIET
Exogenous variables: None
Automatic selection of maximum lags
Automatic selection of lags based on AIC: 0 to 1
Total number of observations: 38
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	26.1852	0.0035
ADF - Choi Z-stat	-2.79325	0.0026

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(GDPC?)

Series	Prob.	Lag	Max Lag	Obs
D(GDPC_INDON)	0.0099	1	1	7
D(GDPC_MALAY)	0.0076	0	1	8
D(GDPC_PHILIP)	0.1899	0	1	8
D(GDPC_THAI)	0.3477	0	1	8
D(GDPC_VIET)	0.4130	1	1	7

APPENDIX 37

ADF – Results for Country Characteristics (PG) at 1st difference (Individual intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/26/10 Time: 01:14
Sample: 1999 2008
Series: PG_INDON, PG_MALAY, PG_PHILIP, PG_THAI, PG_VIET
Exogenous variables: Individual effects
Automatic selection of maximum lags
Automatic selection of lags based on AIC: 0 to 1
Total number of observations: 39
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	28.6085	0.0014
ADF - Choi Z-stat	-3.10425	0.0010

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(PG?)

Series	Prob.	Lag	Max Lag	Obs
D(PG_INDON)	0.0126	0	1	8
D(PG_MALAY)	0.1098	0	1	8
D(PG_PHILIP)	0.0101	0	1	8
D(PG_THAI)	0.6260	1	1	7
D(PG_VIET)	0.0705	0	1	8

APPENDIX 38

ADF – Results for Country Characteristics (I) at 1st difference (Individual intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/26/10 Time: 01:17
Sample: 1999 2008
Series: I_INDON, I_MALAY, I_PHILIP, I_THAI, I_VIET
Exogenous variables: Individual effects
User specified lags at: 0
Total (balanced) observations: 24
Cross-sections included: 3 (2 dropped)

Method	Statistic	Prob.**
ADF - Fisher Chi-square	14.6025	0.0236
ADF - Choi Z-stat	-2.34680	0.0095

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(I?)

Series	Prob.	Lag	Max Lag	Obs
D(I_INDON)	0.0884	0	1	8
D(I_MALAY)	0.0837	0	1	8
D(I_PHILIP)	0.0911	0	1	8
D(I_THAI)		Dropped from Test		
D(I_VIET)		Dropped from Test		

APPENDIX 39

ADF – Results for Country Characteristics (GD) at 1st difference (Individual intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/26/10 Time: 01:18
Sample: 1999 2008
Series: GD_INDON, GD_MALAY, GD_PHILIP, GD_THAI, GD_VIET
Exogenous variables: Individual effects
User specified lags at: 0
Total (balanced) observations: 40
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	16.6932	0.0814
ADF - Choi Z-stat	-1.87842	0.0302

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(GD?)

Series	Prob.	Lag	Max Lag	Obs
D(GD_INDON)	0.0899	0	1	8
D(GD_MALAY)	0.3119	0	1	8
D(GD_PHILIP)	0.3320	0	1	8
D(GD_THAI)	0.0970	0	1	8
D(GD_VIET)	0.2625	0	1	8

APPENDIX 40

ADF – Results for Country Characteristics (ED) at 1st difference (Individual intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/26/10 Time: 01:19
Sample: 1999 2008
Series: ED_INDON, ED_MALAY, ED_PHILIP, ED_THAI, ED_VIET
Exogenous variables: Individual effects
User specified lags at: 0
Total (balanced) observations: 16
Cross-sections included: 2 (3 dropped)

Method	Statistic	Prob.**
ADF - Fisher Chi-square	9.23881	0.0554
ADF - Choi Z-stat	-1.81809	0.0345

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(ED?)

Series	Prob.	Lag	Max Lag	Obs
D(ED_INDON)	0.0978	0	1	8
D(ED_MALAY)	0.1008	0	1	8
D(ED_PHILIP)		Dropped from Test		
D(ED_THAI)		Dropped from Test		
D(ED_VIET)		Dropped from Test		

APPENDIX 41

ADF – Results for Country Characteristics (GDPC) at 1st difference (Individual trend & intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/26/10 Time: 01:21
Sample: 1999 2008
Series: GDPC_INDON, GDPC_MALAY, GDPC_PHILIP, GDPC_THAI, GDPC_VIET
Exogenous variables: Individual effects, individual linear trends
User specified lags at: 2
Total (balanced) observations: 24
Cross-sections included: 4 (1 dropped)

Method	Statistic	Prob.**
ADF - Fisher Chi-square	23.3735	0.0029
ADF - Choi Z-stat	-1.55767	0.0597

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(GDPC?)

Series	Prob.	Lag	Max Lag	Obs
D(GDPC_INDON)	0.8837	2	2	6
D(GDPC_MALAY)	0.1374	2	2	6
D(GDPC_PHILIP)	0.0001	2	2	6
D(GDPC_THAI)	0.6922	2	2	6
D(GDPC_VIET)	Dropped from Test			

APPENDIX 42

ADF – Results for Country Characteristics (PG) at 1st difference (Individual trend & intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/26/10 Time: 01:22
Sample: 1999 2008
Series: PG_INDON, PG_MALAY, PG_PHILIP, PG_THAI, PG_VIET
Exogenous variables: Individual effects, individual linear trends
User specified lags at: 0
Total (balanced) observations: 40
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	32.3599	0.0003
ADF - Choi Z-stat	-3.70808	0.0001

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(PG?)

Series	Prob.	Lag	Max Lag	Obs
D(PG_INDON)	0.0507	0	1	8
D(PG_MALAY)	0.0863	0	1	8
D(PG_PHILIP)	0.0454	0	1	8
D(PG_THAI)	0.0020	0	1	8
D(PG_VIET)	0.2350	0	1	8

APPENDIX 43

ADF – Results for Country Characteristics (I) at 1st difference (Individual trend & intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/26/10 Time: 01:22
Sample: 1999 2008
Series: I_INDON, I_MALAY, I_PHILIP, I_THAI, I_VIET
Exogenous variables: Individual effects, individual linear trends
User specified lags at: 0
Total (balanced) observations: 24
Cross-sections included: 3 (2 dropped)

Method	Statistic	Prob.**
ADF - Fisher Chi-square	14.5490	0.0241
ADF - Choi Z-stat	-2.33425	0.0098

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(I?)

Series	Prob.	Lag	Max Lag	Obs
D(I_INDON)	0.0806	0	1	8
D(I_MALAY)	0.0753	0	1	8
D(I_PHILIP)	0.1142	0	1	8
D(I_THAI)		Dropped from Test		
D(I_VIET)		Dropped from Test		

APPENDIX 44

ADF – Results for Country Characteristics (GD) at 1st difference (Individual trend & intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/26/10 Time: 01:23
Sample: 1999 2008
Series: GD_INDON, GD_MALAY, GD_PHILIP, GD_THAI, GD_VIET
Exogenous variables: Individual effects, individual linear trends
User specified lags at: 1
Total (balanced) observations: 35
Cross-sections included: 5

Method	Statistic	Prob.**
ADF - Fisher Chi-square	17.7765	0.0589
ADF - Choi Z-stat	-1.91629	0.0277

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(GD?)

Series	Prob.	Lag	Max Lag	Obs
D(GD_INDON)	0.3046	1	1	7
D(GD_MALAY)	0.4300	1	1	7
D(GD_PHILIP)	0.1725	1	1	7
D(GD_THAI)	0.2439	1	1	7
D(GD_VIET)	0.0250	1	1	7

APPENDIX 45

ADF – Results for Country Characteristics (ED) at 1st difference (Individual trend & intercept)

Null Hypothesis: Unit root (individual unit root process)
Date: 10/26/10 Time: 01:24
Sample: 1999 2008
Series: ED_INDON, ED_MALAY, ED_PHILIP, ED_THAI, ED_VIET
Exogenous variables: Individual effects, individual linear trends
Automatic selection of maximum lags
Automatic selection of lags based on AIC: 0 to 1
Total number of observations: 15
Cross-sections included: 2 (3 dropped)

Method	Statistic	Prob.**
ADF - Fisher Chi-square	8.25096	0.0828
ADF - Choi Z-stat	-1.53523	0.0624

** Probabilities for Fisher tests are computed using an asympotic Chi -square distribution. All other tests assume asymptotic normality.

Intermediate ADF test results D(ED?)

Series	Prob.	Lag	Max Lag	Obs
D(ED_INDON)	0.0603	1	1	7
D(ED_MALAY)	0.2681	0	1	8
D(ED_PHILIP)		Dropped from Test		
D(ED_THAI)		Dropped from Test		
D(ED_VIET)		Dropped from Test		

APPENDIX 46

Panel Co integration Result Fiscal Variable

Pedroni Residual Cointegration Test
Series: GDPC? TTR? NT? PE? TE? BD?
Date: 10/31/10 Time: 13:08
Sample: 1999 2008
Included observations: 10
Cross-sections included: 5
Null Hypothesis: No cointegration
Trend assumption: No deterministic trend
Lag selection: Automatic AIC with a max lag of 0
Newey-West bandwidth selection with Bartlett kernel

Alternative hypothesis: common AR coefs. (within-dimension)

	Statistic	Prob.	Weighted Statistic	Prob.
Panel v-Statistic	-1.683000	0.0968	-3.335655	0.0015
Panel rho-Statistic	- 3.290017	0.0018	1.727758	0.0897
Panel PP-Statistic	-1.890541	0.0668	-22.71106	0.0000
Panel ADF-Statistic	-1.690501	0.0956	-6.321578	0.0000

Alternative hypothesis: individual AR coefs. (between-dimension)

	Statistic	Prob.
Group rho-Statistic	- 3.706948	0.0004
Group PP-Statistic	-6.034540	0.0000
Group ADF-Statistic	-1.077741	0.2232

Cross section specific results

Phillips-Peron results (non-parametric)

Cross ID	AR(1)	Variance	HAC	Bandwidth	Obs
_INDON	0.246	0.000394	0.000103	6.00	9
_MALAY	0.273	0.000128	0.000128	0.00	9
_PHILIP	-0.587	2.79E-05	1.33E-05	8.00	9
_THAI	0.035	0.000328	5.84E-05	8.00	9
_VIET	-0.579	4.97E-23	6.90E-24	6.00	9

Augmented Dickey-Fuller results (parametric)

Cross ID	AR(1)	Variance	Lag	Max lag	Obs
_INDON	0.246	0.000394	0	0	9
_MALAY	0.273	0.000128	0	0	9
_PHILIP	-0.587	2.79E-05	0	0	9
_THAI	0.035	0.000328	0	0	9
_VIET	-0.579	4.97E-23	0	0	9

APPENDIX 47

Panel Cointegration Result Country Characteristics

RESULTS:

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panel v-stat = 3.06228

panel rho-stat = -3.85034

panel pp-stat = -4.92189

panel adf-stat = -5.04850

group rho-stat = -3.50186

group pp-stat = -2.92373

group adf-stat = -1.26478

Nsecs = 5 , Tperiods = 10 , no. regressors = 4

****

Currently computing panel statistics. Please wait.