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The Impact of Government Debt on Macroeconomic Indicators: Evidence from G7 and ASEAN Countries

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From G7 and ASEAN Countries

(TITLE)

BY

Amani Ahmed ALzahrani

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Evidence from G7 and ASEAN countries

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Abstract

Government debt continues to be a critical economic policy issue, which largely affects both developed and developing countries, due to elevated level of debt. From a general viewpoint, government debt is a crucial feature of a country's financial system and a major indicator that contributes to the formation of a country's reputation in the international market.

This paper investigates the impact of government debt on certain macroeconomic and wellbeing indicators in a group of industrialized and developing countries. That is, the study seeks to examine how government debt influences GDP per capita, domestic and foreign investment, and HDI in both G7 and ASEAN nations during the period from 1995 to 2015.

While the results indicate that there is a positive relationship between government debt and macroeconomic indicators in G7 countries, the government debt of ASEAN countries has a negative impact on macroeconomic and wellbeing indicators. Some presumed causes of the different impact of the debt on G7 vs ASEAN economies is "allocation effect", "threshold effect", and "institutional quality effect."

Keywords: GDP per capita, human development and investment, FDI, national debt, G7, ASEAN.

Chapter 1

Introduction

According to the World Debt Clock, the United States' total government debt is currently, estimated at around \$21 trillion, which is more than 100% of the country's GDP. The United States, however, is not the only country that has accumulated such enormous amount of debt. Many other countries such as the G7 and ASEAN have also accrued vast levels of debts during the last 70 years. Historically, Government debts have been building up since early 1900s for both developed and developing countries, and it is still on the rise (Checherita-Westphal et al., 2010). The average levels of government debt have risen by approximately 66% throughout the 20th century compared to the preceding century (Tanzi & Schuknecht, 1997). Currently, the debt to GDP ratio averaged around 110% for developed countries and 65% for developing countries.

One of the major prerequisites for economic growth and prosperity robust fiscal foundation and a disciplined fiscal policy. This allows countries to acquire access to capital, get investment resources for both the public and private sectors, increase business and consumer confidence, and promote overall financial health and safety. It follows that governments that fail to act in the above manner is likely to not to enjoy these benefits. For instance, if the long-term fiscal drawbacks, such as high government debt and debt service, remain unsolved, the elevated cost of interest crowds out future investors, causing various businesses to drop out, which lowers consumer confidence, and the overall economy becomes prone to economic crisis.

The prominent British playwright and poet Shakespeare said in one of his plays “neither shall you be a borrower or a lender.” Although this adage discourages borrowing, it appears no country obeys it. Currently, many governments run on borrowed money to cover the shortcomings of their economy, in order to avoid increasing taxes or lowering public spending. In 2017, for example, the government debt of the US passed the \$20 trillion mark for the first time in history, while the UK owed about £1.9 trillion (or \$2.5 trillion). Japan remains one of the countries with the highest government debt in the world, as it owes 250.4% of its GDP as of 2016 (Trading Economics , n.d.).

Considering previous and current scholars’ notes, central bankers’ testimonials, and government officials’ announcements, debt often assumes to be a double-edged sword. When debt is moderately accrued and wisely utilized, it fosters economic growth and welfare. However, excessive borrowing, overreliance and imprudence can lead to disastrous outcomes. Can result in financial ruin and bankruptcy for both individuals and firms. Not only high government debt can result in financial ruin but also it impedes the ability of a government to deliver necessary services to the people. The high and increasing debt provides a valid source of concern. The major course of crisis that started years ago in U.S. and spread all over the world began with private debt, and currently public debt in the contemporary society. Finance is a key building block that spurs economic growth. Without finance and access to loans, many countries would remain poor. Borrowing enables individuals to consume even when there is no current income. Debt allows businesses to invest when revenues figures do not allow. The capacity to borrow

gives the fiscal authorities the ability to regulate the macroeconomic variables. Therefore, does government debt matter?

It is often believed that government debt is one of the key macroeconomic indicators which determines and defines a country's image in the international markets (Riberiro et al., 2012). The image of a country in the global scale is a critical factor for trade, investment, as well as many other important international interactions. It is, therefore, prudent to ascertain whether government debt is beneficial or retrogressive on macroeconomic indicators such as economic growth, poverty, investments and education as the global average debt to GDP ratio is expected to rise in the near future. This deduction is key in enabling both developed and developing governments to make appropriate and informed policy decisions in relation to public debt. The goal of this paper is to analyze the impact of government debt on Macroeconomic indicators in G7 and ASEAN countries. In addition, it aims to study the effect of control variables that play an essential function to determine economic growth. The reminder of this paper is organized as follows: Chapter 2 shows literature review. Chapter 3 covers the theoretical part. Chapter 4 covers the data and the Methodology that I used it in this study. Chapter 5 presents the relationship between the variables. Chapter 6 presents the results along with a discussion and explanation. Chapter 7 concludes.

Chapter 2

Literature Review

A good number of panel studies by different researchers have supported the premise that there is a non-linear correlation between GDP and the government debt. The relationship between government debt and GDP has been characterized by an inverse U-shaped relationship whereby the country experiences a positive economic growth impact due to government debt until the debt to GDP ratio exceeds a threshold level and a negative impact is experienced. Even though, there are several discrepancies about the purported relationship despite the consensus among a majority of researchers. For instance, there is no clarity about the specific threshold where the government debt to GDP ratio starts to exhibit negative influences on the country's economic growth, and the extent of the negative impact on economic growth.

There is not yet a total agreement among all researchers regarding the non-linear relationship between government debt and economic growth rates. Some of the researchers seem to object to the outright conclusion. Schclarek (2004) reports that some panel studies failed to find a significant relationship between a government debts and economic growth in both developed and developing countries. However, a relationship was discovered between external debt and economic growth for developing countries, which was characterized as negative linear relationship.

Even though majority of studies are in agreement about the existing relationship between government debt and economic growth, there are still concerns about the channels through which the different researchers used in the establishment of the relationship. Calderon and Fuentes conducted a panel study for over 40 years across 22 Latin American countries. This study suggested that some specific structural aspects, the development of financial markets, the quality of institutions, and the levels of GDP per capita might improve or worsen the resultant effect that government debt will have on the country's economic growth rate.

Checherita (2012) investigated several specific channels through which government debt influenced the growth rates in the European countries and found public investments, private savings, and total factor productivity to be the most significant channels. However, Schclarek (2004) objected to the proposition that total factor productivity had significance in either developed or developing countries and instead argued that capital accumulation was the sole significant channel.

According to Spilioti (2015), government debt has an impact of lowering the level of Gross Domestic Product and thus economic growth. In the same vein, an examination of the impacts of the economic decline in the Euro area between 2007 and 2011 is a testimony that "the gross government debt and deficit ratios have been increased rapidly causing a negative effect in the long-term fiscal sustainability" (Spilioti, 2015). However, this has raised the question of whether the reverse relationship between government debt and GDP is only valid for certain economies as well as a given level of government debt. In the opinion of Adam and Bevan

(2015), at a threshold of 1.5% of the GDP, fiscal deficit affects the level of economic growth in developing countries.

The impact of government debt also spreads to HDI (Human Development Index). Usually, the HDI is used to measure the economic development and welfare of a country, and it examines the income levels, life expectancy, and education. For that reason, it gives an overall economic development index. Government debt affects HDI and FDI (Foreign Direct Investment) because it influences all aspects of investment. In particular, it reduces public investment. As government debt increases, the government spends more of its budgets on interest costs, and such a move crowds out public investment by affecting local and foreign investors. In the US, for example, the CBO estimated in 2017 that the interest costs of government debt is likely to reach \$5.2 trillion. In other words, the interest charges will triple the current program used by the government to run the national economic needs.

Additionally, most researchers agree that there is a significant relationship between investment and debt. Investments can also be classified into domestic and foreign, and both types of investments are critical to a country. Foreign lending expands a country's resources, which lead to an increased output. Domestic lending tends to distribute the resources within the country with lower susceptibility to debt crisis. Consequently, a country's debt level is a key indicator to potential investors who are interested in the knowledge about the country's future ability to repay its debts. High debt levels, especially in low-income countries, tend to affect the investors' confidence, which directly affects both domestic and foreign investment

in a country. As a result, a decrease in investment leads to a corresponding decrease of economic growth of a country.

According to Hossein and Samin (2014) there is a strong correlation between the Rwandese GDP per capita and foreign direct investments (FDI) affirmed by the positive impact on the economic growth. The FDI inflows in Rwanda have been growing over the recent years, which have led to a corresponding increase in GDP per capita. These economic events are subject to the Rwandese government reforms put in place to stabilize the macroeconomic and political environment to create a conducive environment for investments.

Moreover, if Federal borrowing does not compete with the funds available in the capital markets that will reduce the interest rates and raise the investments in structures and equipment. As a result, entrepreneurs (private) investors have to deal with low capital costs, potentially increasing innovation and increasing the opportunities for new breakthroughs that can boost the overall health of the economy. In some cases, both the domestic and foreign investors start to cast doubts on the government's readiness and ability to pay off the government debt. They also begin to feel that the government is ready to raise the interest rates on investments to get more money to pay off debts or run the economy if it is in a state that hampers borrowing.

Chapter 3

Theoretical Background

3.1. Does Government Debt Matter?

The bankruptcy of the Lehman Brothers in 2007, which has led to the global financial crisis, has also been accompanied with government debt crisis since several countries had growing fiscal imbalances. The phenomenon started in Greece, spreading out to peripheral countries in Europe such as Italy, Ireland, Portugal, and Spain. Although the policymakers and economists based their argument on the main macroeconomics question, the real source of the inherent problem in policy and economic discussions has not been defined to date. Even with numerous attempts by governments to curb the problem, poor economic performance has persisted and costs have increased for societies (Afonso & Alves 2015).

Buchanan (1996) refers to the discussions around government debt as murky battleground while pointing out some critical points faced by politicians and social scientists. The effect of government liability accumulation on the financial markets, the impact of debt on real economic performance, and fiscal sustainability have been high contentious issues owing to the massive government debt build-up. Poor economic performance is a reflection of low productivity and growth, which lowers the capacity of a country to repay its debt thus aggravating the fiscal sustainability problem.

According to the National Debt Clocks.Org (n.d), the government debt of Germany and Italy, as a percentage of their GDP, is 65.4% and 137.31%, respectively. Japan remains one of the countries with the highest government debts in the world, as it owes 250.4% of its GDP as of 2016 (Trading Economics , n.d.). In March 2017, the general gross debt of the UK was 86.7% of the GDP, which was 26.7% points higher than the 60% reference value set out by the Protocol on the Excessive Deficit Procedure (Office for National Statistics , n.d.). By the end of 2017, the US national debt was \$23.26 trillion, which was about 103% of the GDP (USgovernmentspending.com, n.d.) Figure 1 and 2 show the highest government debt in G7 countries during this period of study.

Just like the G7 nations, the ASEAN countries have national debts. According to Malaysian Digest (2017), Malaysian government debt was 50. 9% of the GDP (RM685 billion) in June 2017 (Malaysian Digest , 2017). Singapore's government debt increased from 496028 SGD Million (Q32017) to 502021.90 SGD Million (Q42017). Thailand is one of the countries with a national debt lower than 50% of the GDP. By the end of 2016, it had a national debt of Bt5.92 trillion (or 41.76% of the GDP (The Nation , 2018). In 2017, Corr (2017) quoted the Philippine Secretary of Management and Budget, Diokno Benjamin, stating the government planned to spend \$167 billion US on infrastructure. If that planned went through, the country's national debt would increase by more than 50% from \$123 billion to \$290 billion.

Corr (2017) predicted that the high rates that Philippines most likely lender, China, could impose on the new debts are likely to increase it beyond \$1 trillion in

the next decade. According to Corr's analysis, a 10% interest rate on the new debt could see Philippine's national debt reach \$452 billion, in which case the national debt to GDP ratio will be 197%. At the end of 2017, the government debt of Indonesia reached \$294 billion. Although the value was higher in the 2016 standings, Indonesia recorded one of the world's lowest government debt to GDP ratios, with a 29.2% (Indonesia Investment , 2018).

Another dimension of analyzing the effects of government debts on the GDP of the country considers the use to which the accrued government debt is put. A study conducted by Aschauer (2000) in the United States between 1970 and 1990 concluded that whenever government debt is used to finance development programs (as a productive capital), it leads to an economic growth. However, this growth is also limited to a certain level of threshold. From the foregoing, and as justified by the analysis done on the United States as a sample of a developed nation, it can be concluded that the direct association between the level of government debt and economic development is attributable to the use to which the accrued debt is put into. From this analysis, it is clear that developed countries use the accrued government debt as productive capital, unlike the developing countries. As such, public debts in the developed countries result in GDP growth, unlike in the less developed world.

In short, the negative correlation between GDP and government debts in the less developed countries is attributable to high government debt to GDP ratio and the uses to which they put the debts. On the other hand, the developed countries realize a positive relationship between government debt and growth of the economy because the funds are used as productive capital. For instance, lead to the creation of

employment or the provision of basic public services like healthcare, which in turn contribute to economic growth. Figure 1 and 2 indicate to government debt in G7. In addition, figure 3 show the government debt in ASEAN countries.

3.2. Good governance key to economic recovery

The studies have also shown that there has been a positive relationship existing between good governance of a country and GDP per capita which is the measure of a country's total output where the gross domestic product is divided by the total number of residents in the country. This is seen during comparison showing performance in these countries (Jones and Wren, 2016). As noted by Kaufman and Kraay (2002), the relationship between these two variables has also been considered to be rigorous as well as complicated by several authors (Kaufman and Kraay, 2002). A significant positive casual effect is noted to exist between good governance and high per capita income in that direction. However, when acting from per capita income to leadership, the bad casual effect is weaker.

The question about the effects of average governance and the size of a government on GDP per capita has been longstanding. This debate has had input both from proponents and opponents of government debt and has been propagated by the ambiguity in the economic theory (Awaworyi, Ugur & Yew, 2015). On the one hand, the size of governments due to the crowding-out effects on the existing private investments can lead to poor economic growth. Additionally, government size also means an increase in taxes and increased inefficiencies, which reduces the level of growth. On the other hand, governance plays an important role in ensuring the

provision of public goods and services, maintaining economic confidence, and ensuring there is rule of law (Awaworyi, Ugur & Yew, 2015).

On this same note, Terasawa and Gates (1998) concluded that the bureaucracy of the Japanese government has contributed to the constant economic growth of the country. Notably, governance led Japan out of the crisis that the country faced after WWII. Conversely, UNDP (2015) as cited by Azam and Emirullah (2014), alleges that corruption remains one of the major impediments to economic growth in most of the developing countries. Based on statistics from most of the Asian-Pacific nations (that include the ASEAN countries), Azam and Emirullah (2014) found out that “39, 71, and 71 percent of respondents thought that the level of corruption had increased in Malaysia, Indonesia and India, respectively.” Similarly, Philippines, Indonesia, and Thailand were found to be amongst the most corrupt countries from a study by Lim (2003) as cited by Azam and Emirullah (2014).

Moreover, governments pass policies that influence businesses either directly or indirectly. Policies such as the minimum wage, subsidies for investments create a conducive environment for investments by ensuring political stability, government expenditure, business regulations, and interest rates critically influence the choices of investment destinations (Williams, 2002). Also, governance play a critical role in ensuring the provision of goods and services and ensuring there is rule of law as aforementioned (Awaworyi, Ugur & Yew, 2015). For instance, in France, the government is committed to supporting investments, whether foreign or local. Moreover, the country’s membership to the European Union further facilitates the movements of people across the borders of the country further facilitating

investments (Fanto, 1995). In the United States, it has been shown that the institutional governance has been very vital in boosting the level of investments in the country as noted by Fanto (1995). However, vices such as corruption, political instability, and high taxation negatively affect businesses.

Corruption has been indicated as a hindrance to investments in the countries. As Azam and Emirullah (2014) asserted, Indonesia, Thailand, and the Philippines have been considered to be the most corrupt hence hindering investments. Similarly, a study on the influence of political instability and GDP in Malaysia also found that it would take a long time for investments to move back to its equilibrium position following the political instability in the country (Nazeer and Masih, 2017). Further, as documented by Euromonitor International (2018), the political coup in 2006 in Thailand has had adverse effects in all of the ASEAN countries. For instance, this greatly affected consumer spending, tourism, and the confidence of the investors across the region (Euromonitor International, 2018). Therefore, whereas governance positively contributes to investments in the countries, poor governance partly discourages investors from countries.

3.3. Government expenditure in macroeconomic

For decades, the issue of the relationship between government expenditure and economic growth has been a sustained interest. One dominant perspective in this view is Wagner's law, which ties the economic growth of a country to the level of government expenditure (Azam and Emirullah, 2014). On the other hand, supporters of the Keynesian model assert that economic growth, which results from increased

government expenditure, is premised on how these expenditures affect the decisions made by the private sector and their long-run equilibrium (Azam and Emirullah, 2014, p. 126). As such, if the government expenditure is such that it encourages private sector investment, then it will lead to increase in GDP per capita.

A deduction of research conducted by Mohammadi and Ram (2015) on the relation between these two variables in Korea, Japan, Philippines, Malaysia, Thailand, and Singapore using the Wagner's model posited "there is no discernable pattern of relation between mean growth rates of the two variables across the six countries." However, the research further reveals that apart from Japan (a G7 country), it cannot be concluded for that an increase in government expenditure leads to a corresponding increase in the GDP per capita in the other ASEAN countries (Mohammadi and Ram, 2015). For instance, from the presented statistics, while there is a consistent growth in the GDP in all the countries, government expenditure has remained stagnant in all the other countries except Japan (Mohammadi and Ram, 2015).

More precisely, while the GDP per capita of Philippines grew over the period between 1960 and 2008, the share of the government expenditure remained constant as noted by Mohammadi and Ram (2015). Therefore, it can be stated that while an increase in government expenditure leads to an increase in GDP per capita in G7 countries. As such, government expenditure will only substantially contribute to an improvement in the HDI if the expenditure is channeled to boosting all or any of these factors (health, education, and economic growth). As aforementioned,

education expenditure by the government in both the ASEAN and G7 countries positively contribute to the efficiencies and effectiveness of the sectors (Mallick, Das, and Pradhan, 2016). Notwithstanding, the level of change varies greatly amongst the countries due to other factors such as corruption and poor governance in the ASEAN states (Prasetyo and Zuhdi, 2013).

On the other hand, government expenditure in the G7 countries leads to an improvement in the GDP of those countries as opposed to the ASEAN countries (Mohammadi and Ram, 2015). For instance, while government expenditure in Japan led to a growth in the GDP of the country as shown in from a research carried out by Mohammadi and Ram (2015). Similar research could not find the relationship between government expenditure and economic development in the Philippines. Based on this data therefore, and assuming all the other factors affecting HDI are constant, it is notable that an increase in government expenditure in G7 countries led to an improvement in the human development index of the countries while an increase in government expenditure amongst the ASEAN states did not necessarily lead to an improvement in the HDI in the countries. This can be attributed to among other factors the use of the funds, transparency, and population pressures that stretch government resources.

3.4. Foreign investor vision of the government debt

The interest rate is amongst the various determinants of FDI. In the opinion of Singhania and Akshay (2011), interest rates provide a good mechanism for measuring FDI, especially when it is adjusted for inflation. Notably, most of the

investors look for regions that provide a higher interest rate as investment destinations. As such, most countries with higher rates of return attract more foreign direct investment as opposed to those which provide lower rates of return. Thus, capital will always flow from a lower rate country to a higher rate country.

Stronger economic structure and infrastructure tend to attract foreign investors to invest directly into that particular country. Similarly, the government intervention in the economy is bound to increase in the event that the free market fails to work properly such that the market mechanism is incapable of using its facilities or developing new competitive advantages. The reduction of foreign debt burden leads to the increase in financial resource as a result of capital inflows.

However, the increase in the foreign debt blurred the foreign investors' vision while created a negative view of the future economic expectations, which significantly reduced the level of investment in a country. Additionally, the size of the government was discovered to have a negative impact on attracting foreign direct investments whereas the increased presence of the government led to lower participation of the private sector. However, GDP related positively with FDI such that increased production would lead to increased prospective consumption and investment. Ultimately, foreign direct investment is attracted. In recent years, the relationship between foreign direct investment (FDI) and institutional factors has received a great attention (Kurul and Yalta, 2017).

Trade openness has been noted to pull foreign investors. Most commonly, private investors pay close attention to the framework of the institutions of the countries where they undertake their ventures. On this note, therefore, Daude and

Stein (2007) as cited by Kurul and Yalta (2017) recorded that developing countries need to pay close attention to the quality of their institutions to attract more foreign direct investments. For example, from the empirical studies, corruption was found to be a hindrance to FDI (Kurul and Yalta, 2017). Consequently, Sim et al (2015) noted that the level of corruption in Thailand has been one of the factors leading to a sharp fluctuation in FDI. Similarly, the high corruption levels have been a hindrance to FDI in Singapore between the year 2000 and 2010 (Sim et al., 2015). Other notable governance factors that have negatively influenced FDI in the ASEAN countries include the rampant political instability, regulatory quality, and the rule of law (Kurul and Yalta, 2017).

Chapter 4

Methodology and Data

4.1. Panel techniques

In the paper, a panel data techniques are utilized in the determination of the impact of government debt on economic and wellbeing indicators in the G7 and ASEAN countries. The panel data estimation is effective in highlighting individual heterogeneity in the event that the cross-sections have some aspects of differentiating features. Therefore, there is a lower propensity to bias when compared with approaches like time series, which do not account for heterogeneity since some differentiating features may vary across time. This is the first advantage of using panel data techniques. Other advantages will include the higher estimation efficiency, less collinearity, and more accuracy in measuring the effects of individual samples due to the availability of larger data set when compared with cross-section and time-series approaches.

A random effect model or fixed effect models can be used in the panel model to analyze for the unobserved effects. The random effect model is the appropriate model to examine the unobserved effects when accepting that omitted variables exist and assuming no correlation between the unobserved variables and the explanatory variables. However, in the event that there is a correlation between the explanatory and the omitted variables, it is prudent to employ a fixed effect model to provide for any omitted variable bias. Consequently, a Hausman test was run to determine the appropriate approach for handling the unobserved

effects. Ideally, the test is designed to examine whether random effect is the best choice by accepting the null hypothesis, or rejecting which suggests that the fixed effects estimation is more appropriate. In this case, the Hausman test rejected the null hypothesis hence the fixed effects estimation is chosen. This study will have four major specifications for the dependent variables

(GDP) Per Capita = f (Government debt, interaction terms, X)

HDI = f (Government debt, interaction terms, X)

FDI= f (Government debt, interaction terms, X)

INV= f (Government debt, interaction terms, X)

... (1)

GDP per capita, human development index, foreign direct investment and investment represent Government debt and several of the interaction terms while (X) is a set of control variables such as

Trade, inflation ...etc.

Therefore, we can estimate the model as follows:

$$Y_{it} = \alpha_{it} + \beta_1(\text{Gov'debt})_{it} + \beta_2(\text{HdI})_{it} + \beta_3(\text{Fdi})_{it} + \beta_4(\text{Inv})_{it} + \beta_5(\text{debt} * \text{int})_{it} + \beta_6(\text{X})_{it} + \epsilon_{it}$$

...(2)

Where, these are macroeconomic indicators that determine Y_{it} = (GDP per capita, FDI, INV) and well-being which is HDI, X is a set of other control variables, ϵ_{it} is the error terms.

4.2. Data Description and source

The sample covers the data from 1995 to 2015. I utilize two groups, G7 countries that include France, Germany, Italy, Japan, Canada, the United Kingdom, and the United States. We have chosen only five countries of (ASEAN Association of Southeast Asian Nations) such as Malaysia, Singapore, Thailand, the Philippines, and Indonesia which have the complete data. The goal from this research is to study the impact of government debt on macroeconomic indicators. In addition, to define government borrowing can be beneficial or harmful to the economy. The database has been collected from various sources: World Bank's World Development Indicator (WDI), OECD Economic Outlook database and United Nations Development Reports.

(GDP) Per Capita

The measure of total output of a country makes the gross domestic product (GDP) divide by total number of citizens in the country. When used in comparison, it shows growth and productivity of a country in its economy (World Bank).

(FDI) Foreign Direct Investment

FDI refers to the kind of investment that an individual or a company makes in business belonging to another country. Where there is owning of the business fully by the company, individual or country in the foreign country, which is FDI net subtract Outflows (World Bank).

(Investment) Gross Fixed Capital Formation

Net increase in physical assets (Investment – disposals) within the measurement period where depreciation of fixed capital and land purchases are not counted. Which is investment in equipment and construction.

(Govt) General Government final consumption expenditure

It is inclusive of the current expenditures belonging to the government when they have goods and services purchased, expenditures on security and national defence excluding government's military because they form the capital formation for the government (World Bank).

Inflation, Consumer Prices

This is the percentage change done annually for average consumer's cost when they acquire their goods and services which are capable of being changed in other intervals in the same year that is measured by the index of the consumer price (World Bank).

(POP) Population

Refers to the exponential rate of growth for the population in the midyear where it is expressed as a percentage and all residents are counted regardless of their status or even citizenship (World Bank).

(HDI)The Human Development Index

A metric system assessing the social and economic development levels of countries developed by the United Nations. The metrics ranges from mean years of schooling, expected years of schooling, life expectancy at birth, as well as the gross national income per capita. In addition, it is important in comparison of developments with other countries (UND)

Trade

Is the sum of exports and imports of goods and services measured as a share of gross domestic product. (World Bank)

Governance

Refers to the kind of processes and structures that are made to ensure transparency, rule of law for the people and equity among others in a country's participation. Additionally, it is also inclusive of norms, rules and values that are to be managed in the public affairs in a way that responsiveness and inclusiveness are considered (World Bank).

Central government debt

This is the amount of the liabilities of the government in gross terms where a reduction is done using the amount of equity and other financial derivatives that the government uses. It includes the domestic and foreign liabilities which include the likes of currency, deposits of money, shares, and loans among others.

Real interest rate

Real interest rate can be defined as the lending interest rate that has been adjusted to provide for inflation with respect to the GDP deflator measurement. However, their comparability is limited due to the varied terms and conditions attached to lending rates in different countries (World Bank).

Government expenditure on education

Includes current, capital, and transfer expenditures and can be expressed as a percentage of total general government expenditure on all sectors. It also covers the expenditure that has been funded by transfers from foreign sources to government. The term General government is used to refer to the local, regional and central levels of governments (World Bank).

Health expenditure

Includes the sum made for the health expenditure in the private and public sectors where all the health services are included and activities of family planning together with any kind of emergency aid that is designated for health

4.4. Descriptive Statistics G7 countries

Table 1 Descriptive Statistics for G7 Countries

Variable	Obs.	Mean	Std. Dev.	Min	Max
GDP per Capita	140	1.165103	1.889293	-5.911	5.59
HDI	147	.8769864	.0269083	.799	.926
FDI	147	.8908269	2.086402	-7.683088	9.659468
Trade	147	49.57106	18.00783	16.67948	85.87476
Inflation	140	1.629506	1.130129	-1.352837	5.244371
Population Growth	147	.4948095	.4414191	-1.853715	1.20396
Health Expenditure	147	44.71433	187.913	6.490289	13.28121
Education Expenditure	147	11.40786	2.097105	8.00616	16.57224
Interest rate	147	3.057836	2.084754	-.8746982	10.45667
Government spending	147	18.97238	2.476501	13.99592	24.01168

Government debt	147	91.67118	35.80586	15.10873	197.9529
GCF	147	21.24523	2.885217	14.42836	30.86515

The observation is 147 for seven countries from 1995 to 2015. The first row shows the average of GDP per capita for G7 countries which is 1.16\$ with standard deviation is 1.89. In addition, Germany had the highest value of GDP per capita in 2011, which is 5.59\$. In 2009, Italy had the lowest value, which is -5.911\$. The second row shows the mean for total human development rate is nearly to .88 in all G7 countries. In addition, Germany in 2015 had the highest value of HDI. In 1995, the lowest value was .79 in Italy. The third row illustrates the average of foreign direct investment is about .89. In addition, Germany had the lowest value, which is -7.7 in 2000. The highest value of FDI is .92 in France in 2002. The standard deviation was 2.08. The next row indicates that, on average, the trade openness is 49%. In addition, the highest was 85% in Germany in 2012. The lowest was in Japan in 1995. The standard deviation was 18%. The fifth row shows the mean of inflation rate, which is 1.62% in G7 countries. The lowest value was negative -1.3% in Japan in 2009 with standard deviation 1.13%. The highest value 5.2% in Italy in 1995. The mean of population growth rate was about .49. Besides, the lowest was negative -1.85% in Germany in 2011 while the highest value was 1.2 % in United States in 1997. The standard deviation was .44%. The next row shows the mean of health expenditure rate was 44.7 % with standard deviation 187% in G7 countries. Moreover, the lowest was 6.4 % in Japan in 1996 and Japan had the highest value 13.2% in 2015. The following row represent the mean of education expenditure rate about 1.40%. The standard deviation was 2.08%. The lowest was in Italy in 2014

while the highest was in United States in 2003. The total average of private credit was 83.1% with standard deviation about 85.2%. United Kingdom had the highest value, which was 1034% in 1998 while the lowest value was 60.1% in Italy in 2001. The next row illustrates the mean of the interest rate in these seven countries, which is, 3.0 with standard deviation 2.0. The highest was in Italy in 1995 and the lowest was in Japan in 2015. The following indicates the mean of government spending was approximately 19% with standard deviation 2.4%. France had the highest percentage, which is 24 in 2014; however, the lowest percentage was 14 in United States in 1998. Noticing that the highest value of government debt 197 % was in Japan in 2015 and the lowest value was in 2001 in Unites states. The total government debt average for G7 countries was about 91.7% with standard deviation 35.8%. The last row shows the mean value of gross capital formation is 21.2 as a percentage of GDP. Moreover, the highest value was in Japan in 1996 while the lowest value was in United Kingdom in 2009. The standard deviation was nearly 2.9.

4.5. Descriptive Statistics ASEAN countries

Table 2 Descriptive Statistics for ASEAN Countries

Variable	Obs.	Mean	Std. Dev.	Min	Max
GDP per Capita	100	10.90953	2.424654	5.347391	16.9871
HDI	105	.7108667	.0903919	.564	.925
FDI	105	-1.923032	4.804289	-17.51878	16.36765
Trade	105	4.54009	6.251932	-.8950214	58.38709
Inflation	100	1.666816	.8810473	-1.474533	5.321517
Population Growth	105	2.967607	3.748094	-14.34678	13.21649
Health Expenditure	105	8.667638	53.59405	1.925298	552.5685
Education Expenditure	105	17.59638	4.067177	6.14646	28.3886
Interest rate	105	4.304092	4.443788	-24.60017	12.32241
Government spending	105	5.241845	14.53425	-48.2194	47.73128
Government debt	105	51.23592	26.30392	3.673497	110.0376
GCF	105	27.85126	19.44633	-48.2194	54.28838

The observation is 05 for five of ASEAN countries from 1995 to 2015. The first row shows the average of GDP per capita for G7 countries which is 10.9\$ with standard deviation is 2.42. In addition, Thailand had the highest value of GDP per capita in 2015, which is 16.9\$. In 1998, Indonesia had the lowest value, which is 5.3\$. The second row shows the mean for total human development rate is nearly to .71 for these countries. In addition, Singapore in 2015 had the highest value of HDI, which was .92. In 1995, the lowest value was .56 in Indonesia. The third row illustrates the average of foreign direct investment was about negative value 1.92. In addition, Singapore had the lowest value, which is -17.5 in 2004. The highest value of FDI 16.43 was in Singapore in 2008. The standard deviation was 4.8. The next row indicates that, on average, the trade openness is 4.5%. In addition, the highest was 58% in Indonesia in 1998. The lowest was in Thailand in 2015. The standard deviation was 6.2%. The fifth row shows the mean of inflation rate, which is 1.6 % in ASEAN countries. The lowest value was negative -1.4% in Singapore in 2003 with standard deviation .88%. The highest value 5.3% in Singapore in 2008. The mean of population growth rate was about 2.9. Besides, the lowest was negative -14.3% in Indonesia in 1998 while the highest value was 13.2% in Singapore in 2010. The standard deviation was .3.7percentage. The next row shows the mean of health expenditure rate was 8.66 % with standard deviation 53.5%. Moreover, the lowest was 1.92 % in Indonesia in 1997 and Indonesia had the highest value 552% in 2015. The following row represent the mean of education expenditure rate about 17.5%. The standard deviation was 4.0%. The lowest was 16.4% in Indonesia in 1995 while the highest was 28.3% in Thailand in 2000. The total average of private credit was

82.7% with standard deviation about 43.7%. Thailand had the highest value, which was 166% in 1997 while the lowest value was 18.6% in Indonesia in 2000. The next row illustrates the mean of the interest rate in these seven countries, which is, 4.3 with standard deviation 4.4. The highest was in Indonesia in 2001 and the lowest was in Indonesia in 1998. The following indicates the mean of government spending was 5.2% with standard deviation 14.5%. Singapore had the highest percentage, which is 47.7 in 2004; however, the lowest percentage was -48.2 in Thailand in 1998. Noticing that the highest value of government debt 110 % was in Singapore in 2012 and the lowest value was 3.6% in 1996 in Thailand. The total government debt average for G7 countries was about 51.2% with standard deviation 26.3%. The last row shows the mean value of gross capital formation is 27.8 as a percentage of GDP. Moreover, the highest value was 54.2 in Singapore in 2010 while the lowest value was -48.2 in Thailand in 1998. The standard deviation was nearly 19.4.

Chapter 5

Relationship between variables

5.1. The impact of education expenditure on GDP per capita

From a general perspective, government spending on education covers both the government expenditure directed towards educational institutions, and educational-related subsidies given by educational institutions to the households. Usually, this indicator is presented as a share of the GDP and a percentage of the total money spent by the government. Public spending on education is divided into four levels: primary, post-secondary, non-tertiary, and tertiary levels.

Public entities that are directly involved in education spending include the government ministries other than the ministries of education, regional and local governments, and the other public agencies. Public spending on education demonstrates the government's priority of education over the other areas for which it has to budget, such as defense and security, social security, and health care.

According to Jeyhoon, Najafi, and Radooei (2017), the impacts of government expenditure on the level of economic development has been a concern for many economists. Notwithstanding, most of these scholars have failed to create a model that explains the relationship between the public sector's spending and the rate of economic development. On a similar note, however, Jeyhoon, Najafi, and Radooei (2017) cite Wagner's law, which states that economic development should be directly proportional to public expenditure. One such notable expenditure is the education expenditure, which is common in all the government setups. However, as

has been shown by Verhoeven, Gunnarsson, and Carcillo (2007), education expenditure is not constant even amongst the G7 countries. Despite this, though, it has been noted that an increase in public expenditure in the education sector increases efficiency in the sector (Verhoeven, Gunnarsson, and Carcillo, 2007). Consequently, this leads to the production of quality labor in the country, which increases growth and GDP per capita.

Similarly, a study conducted by Lee (1995) on the impacts of education expenditures on the economic development of both Japan and South Korea indicated that the economy of Japan (a G7 country) had significantly grown due to the investments the Japanese government made in the education sector which led to the production of quality labor. As a result, the country realized the highest contribution of education expenditure to its economy at (0.79) as compared to Canada (0.5), the UK and the United States at 0.26 and 0.40 respectively. On the other hand, it has also been found that expenditure in education might have positive impact in the level of economic growth and GDP per capita in some ASEAN countries (Mallick, Das, and Pradhan, 2016). However, Mallick, Das, and Pradhan (2016) further indicated that this change is only realized in the long run. As has been explained, therefore, education expenditure leads to an increase in economic development in both ASEAN and G7 countries, despite the variance in the level of contribution, which should be a subject of any future research.

5.2. The relationship between HDI and education expenditure

Literacy levels are amongst the fundamental factors in measuring the HDI of any country. Apparently, the higher the literacy levels in any country, the higher the HDI, *ceteris paribus*. Interestingly though, the level of education expenditure in all the countries are neither equal nor do they lead to an equal improvement in the literacy levels. Moreover, the level of change depends on other factors such as population that may stretch the available allocated resources. In Indonesia for instance, there is a great diversity in literacy levels even between provinces in the same country as noted by Solihin, Mursinto, and Sugiharti (2017). Further, Solihin, Mursinto, and Sugiharti (2017) alluded that education expenditure only translates into an improved HDI if the funds are effectively spent by the government. Assuming the case of Indonesia as a representative case for the ASEAN countries, the research indicates huge disparities amongst the provinces; hence, it is noticeable that education expenditure does not directly lead to an improvement in the HDI, as far as the literary aspect of the HDI is concerned.

However, despite the disparity in education amongst the developed countries, it is recognized that this expenditure has contributed to the efficiency of the sector as recorded by Verhoeven, Gunnarsson, and Carcillo (2007). Similarly, an empirical research study conducted by Lee (1995) concluded that education expenditure in Japan led to the improvement of the sector. In addition, in the case of Canada, the United Kingdom, and the United States, there has been a noticeable improvement in the education sector as a result of an increase in education expenditure (Lee, 1995). Despite the fact that a similar improvement case applies to

both the developed and the developing countries, it is easily identifiable that both the rates of expenditure amongst the countries and the level of change are not constant.

5.3. The relationship between Investment and Interest rates

Economic policies whether in developed or developing countries have been aimed at creating sustainable growth rates through the accumulation of capital as stated by Ucan (2014). Noteworthy, investments are one of the determinants of GDP in any country, the level of economic development notwithstanding. From a number of empirical studies and as reiterated in a research study by Ucan (2014) and Iqbal and Jamil (2015), interest rates are amongst the many factors that determine the level of investments in these countries. Besides, other factors that affect the interest rates such as investment by the government have been shown to affect the Level of investments in both the developing and the developed countries (Ucan, 2014). In this regard, Kim, Kose, and Plummer (2003) stated that the higher rates of interest in most of the Asian countries through much of the late 20th century caused a decline in investments and economic growth in these regions.

Another perspective of investigating the effects of interest rates on the investment of a country is looking at its effects on the currency exchange rates. After the Asian crisis, for instance, most of the countries resorted to implementing policies aimed at averting the effects of the runaway exchange rates of the time (Kayhan, Bayat, and Ugur, 2013)

According to a research study by Eichenbaun and Evans (1965) as quoted by Kayhan, Bayat, and Ugur (2013), there is a positive relationship between the interest rates and exchange rates in some developed countries such as Italy and Japan. Though not explicitly stated, this has the effect of improving the level of investments in these countries. On the other hand, Schumulker and Kaminsky concluded that in Thailand, Malaysia, China, and the Philippines, there is a negative relationship between the interest rates and the currency exchange rates in those countries (Schumulker and Kaminsky, 1998 as cited in Kayhan, Bayat, and Ugur, 2013). From these researchers, therefore, it can be asserted that interest rates in the G7 countries promote investment while in the ASEAN countries interest rates tend to lower investments.

Chapter 6

Empirical Results and Discussions

6.1. Analyzing the GDP per capita

This section provides the estimates of four different specifications of equation (1) based on the dependent variable. Each specification indicates the impact of government debt on GDP, HDI, FDI, and GCF respectively. Table (1) indicates the result of the first specification where the GDP is the dependent variable. In order to find the impact of government debt on GDP in the G7 countries, we ran four regressions, using various control variables and interaction terms. The results suggest that government debt boosts economic growth. It seems that G7 countries efficiently and effectively use the money they collected from debt to promote economic growth, through spending on infrastructure, education, health care, etc.... In other words, G7 countries have productive capacity therefore we can basically earn an enough income to pay the interest on the debt as a % of GDP. The results is consistent with that of Aschauer (2000). His study, conducted in the United States between 1970 and 1990, concludes that whenever a debt is used to finance development programs, as a productive capital, it leads to an economic growth. However, this growth is also limited to a certain level of threshold or on how the debt is allocated. That is, the direct association between the level of government debt and economic development is mainly attributable to the use the accrued debt, where it is clear that developed countries use the accrued debt as productive capital, unlike the developing countries. Moreover, the three other specifications where HDI, FDI, GCF are dependent variables reveals that government debt in the G7 countries significantly enhances these variables.

In opinion of Aizenman, Kletzer, and Pinto (2007), “public investment in either the stock of physical infrastructure or human capital can increase the productivity of both capital and labor”

On a similar note, Eisner (1984) as cited by Smyth and Hsing (1995) stated that from a stimulus perspective, deficits and debts, if measured correctly, will stimulate consumption, employment, investment, and ultimately economic growth. Premised on these, therefore, it is apparent that the G7 countries used the accrued debt as an investment rather than consumption hence stimulating GDP. Note that an increase in population in developed countries may lead to a strain of the available resources which may deteriorate the factors of production and lower the GDP growth.

The control variables, used in our first specification such as, government expenditure, investment, education expenditure, and trade, have a positive effect on the level of GDP per capita, while population growth have an adverse impact on GDP. FDI, health expenditure, governance and inflation seems to be insignificant variables in our model. The study also utilizes several interaction terms in order to check out on some channels through which debt can impact growth. Surprisingly, most of the debt interaction terms with government spending, and governance, are insignificant. Only the education interaction term comes out significant indicating that the higher the education, the more the impact of debt on GDP per capita.

Statistically speaking, the effect of debt on GDP is significant at 99% confidence level where a 1% rise in debt causes a rise of about 0.08% increase in GDP. Similarly, at 99% confidence level, a 1% change in GGC leads to about 0.94% increase in GDP. On the other hand, a 1% change in population leads to about 13.84% drop in the GDP at 98% confidence level.

Table 1 GDP per Capita G7 Countries

Independent Variables	1	2	3	4
Debt	.0279***	.0814***	.0671**	.0741**
	.0097	.0307	.0094	.0285
GOVT	.3928*	.9448***	.3764*	.3661
	.207	.1725	.2104	.2234
GCF	.4634***	.2426*	.4996***	.4972***
	.109	.0983	.1155	.1174
Inflation	-0.0854	.1854	-0.1026	-.1067
	0.1646	.1555	0.1656	.1789
Population	-1.237**	-1.384**	-0.1226**	-1.275***
	.5233	.5465	0.5236	.543
HDI	.4466***		0.4608	.4581***
	.5233		0.1142	.1258
FDI	.0022	.0005	0.0103	.0113
	.0616	.0661	0.0622	.0635
Trade	.1181***	.0052	.1946***	.1289***
	.0333	.0244	0.2937	.0355
Education expenditure		.0042**		
		.0024		
Health expenditure		.0003		
		.0007		
Debt * education expenditure		.0561**		
		.2459		
Government spending * Debt			.1946	
			.2937	
Debt * governance				.0149
				.0202
Constant	30.27***	4.53	26.71***	26.52***
	-6.521	4.918	7.522	7.871
R square	0.4	0.37	0.41	0.42
Observation	133	133	133	133

Note: *** indicates the significance level at 1% significant level. ** indicates the significance level at 5% significant level. * indicates the significance level at 10% significant level.

Contrary to G7 countries, results from the four different specifications in table (2) indicates a negative and significant relationship between government debt and GDP per capita in ASEAN countries. The adverse impact of debt is not usually a surprise in developing economies, which mostly misuse and/or misallocate the funds. It is highly argued that the positive vs. negative impact of debt greatly depends on what has caused the growth in debt. The question basically is whether the debt incurred is allocated to develop the countries' productive capacity and infrastructure, which aids economic growth, or the debt has been used to support consumption, such as transfer payments.

In addition, the repayment of the debt and the debt service could be another obstacle which causes debt to hinder economic performance. Government usually increase taxes to pay back the debt and cover the interest payments on outstanding debt. Others, they turn to an increase in money growth as a tool for debt repayment, raising the inflation and uncertainty in the economy, which lowers domestic and foreign investment. The monetarist has always believed that deficit financing is inflationary because it leads to excessive money creation. Jubilee (2000) reports that during the 60's, the U.S. had to print more money in order to finance the deficit.

Moreover, empirical evidence and economic theory have mentioned the "crowding out effect" as a major cause in which government debt could adversely impact economic growth. For instance, an increase in government debt can lead to a rise in interest rates, causing capital investment to decline, which translates into weaker productivity and ultimately weaker economic growth. Results in table (6) give a good support to the crowding out effect claim. All specifications show a negative relationship between debt and domestic investment indicating that an increase in government debt may cause a decline in domestic investment in ASEAN countries.

On the other hand, Pattilo et al (2002), Kuman and Woo (2010), Rogoff and Reinhart (2011) Checherita and Rother (2010), Cechetti et al (2011), and Egert (2015) attest to the fact of the asymmetric impact of debt on growth notably in developing economies. That is, there exists a threshold above which government debt will have a negative impact on growth. This correlation becomes stronger as the public debt approaches the GDP of the country. Specifically, while Reinhart and Rogoff (2011) and Checherita and Rother (2010) suggested that debt is most likely to be economically harmful after reaching a threshold of 90 per cent of GDP and in some cases to 100 per cent as reported in Checherita and Rother (2010), Egert (2015) states that this threshold is between 20 to 40 per cent of the GDP, based on the country's income level., however, warns that the precise threshold of 20-50 per cent of GDP should be interpreted cautiously. Cudik et al. (2015) agree on the negative impact of debt on growth, but argue that debt thresholds for advanced economies ranged from 60 per cent to 80 per cent and for developing countries is between 30 per cent and 40 per cent.

The results indicate that, except for Thailand, the debt has exceeded the threshold reported in the literature in ASEAN countries. For instance, the debt as a percentage to GDP has averaged about 46 per cent for Malaysia, 57 per cent for Philippines, 37 per cent for Indonesia, and 94 per cent for Singapore. The results basically support the threshold effect, whether for developing countries such as Malaysia and Philippines, or for more advanced such as Singapore.

Lastly, Quality of institutions also plays a key role in determining the effect of debt on growth. It is widely accepted that corrupted regimes push their countries into more debt that hampers economic growth. Institutional quality also include government effectiveness and how ineffective government can mismanage the debt and waste the funds on inefficient and infeasible projects. The negative sign of the debt-governance

interaction term in table (2) supports the above claim. It indicates that higher level of governance in terms of less corruption and higher government effectiveness reduces the negative impact of debt on growth.

The paper also utilizes two other interactions terms with debt to check their impact on the role of debt in ASEAN countries. Government spending and education expenditure interaction terms show that an increase in either of them will lead to improve the impact of debt on growth.

The results give a strong support to the misallocation or mismanagement of funds.

On a similar note, GCF and FDI are known to boost the production levels in the developing countries, Table (2) reports that an increase in either domestic investment or FDI lead to an increase in GDP. FDI, for instance, leads to an inflow of modern technologies that enhance productivity, increase employment opportunities, and open the markets for further investments thus contributing to an economic growth (growth in GDP) as stated by Spinova and Ougate(2017). Furthermore, it increases employment opportunities and expand the governments' tax base and consumption rates which directly increases the country's GDP.

In ASEAN countries, trade is the only control variable that has adverse impact on GDP per capita. It seems that ASEAN Countries import consumer goods more than productive goods. In the model, HDI, population growth, inflation, government spending, education expenditure and health expenditure, interest rates are found be insignificant variables.

Table 2 GDP per Capita ASEAN Countries

Independent Variables	1	2	3	4
Debt	-.0312***	-.1087***	-.0286***	-.0561*
	.0097	.0275	.0092	.0127
GOVT	.0066	.0201	.0769***	.0013
	.0128	.0123	.0266	.0124
GCF	.0756***	.0752***	.0975***	
	.0132	.0124	.0147	
Inflation	.2044	.2902	.1091	-.0712
	.2338	.2217	.2482	.2341
Population	.0365	.0329	.0425	.0427
	.0516	.0489	.0496	.0497
HDI	.2008		.2269	.1176
	.2961		.2929	.4630
FDI	.0619**	.080***	.0446	.0675*
	.0377	.0365	.0361	.0364
Trade	-.1134***	-.0938***	-.1101***	.1016***
	.0132	.0279	.0281	.0278
Education expenditure		.0052		
		.0068		
Health expenditure		-.1154		
		.2071		
Debt * education expenditure		-.0077***		
		.0009		
Government spending * Debt			-.0011***	
			.0003	
Debt * governance				-.0486**
				.0219
Constant	1.173	12.89***	.8726	4.703***
	1.900	.8933	1.951	2.228
R square	0.56	0.63	0.60	0.62
Observation	105	105	105	105

Note: *** indicates the significance level at 1% significant level. ** indicates the significance level at 5% significant level. * indicates the significance level at 1% significant level.

6.2. Analyzing the Gross Capital Formation (investment)

The impact of debt on domestic investment in G7 and ASEAN countries could be a good example of “crowding in” vs. “crowding out”. Table (3) reports to the result different specification, where the GCF is the dependent variable. Several specifications indicate that debt has a positive impact the investment level, which subsequently contributes to modernizing the economy and fostering its development (Alfaro, et al., 2006). Figure 74 indicate to the percentage of investment in G7 countries between 1995 to 2015. Diamond (1965) argues that there exists two forms public expenditure; a consumption spending such as transfer payment, which might best be viewed as lump-sum gifts to part of the population, or government purchase of physical capital, which would then be rented to entrepreneurs for use in the production process. In this regard, Aschauer (2000) acknowledges that when a government debt is spent on capital formation, it results in an increase in domestic investment and GDP. On the other hand, if the public debt is used to purchase consumables that do not directly translate into capital formation, the net effect is a reduction in GDP. Table (4) reports the opposite case in table (3), at which the debt has a negative impact on investment in ASEAN countries. Figure 5 and 6 show the investment decrease in Malaysia and Thailand.

As mentioned earlier, the difference of the impact of debt on investment between G7 and ASEAN countries may be because debt funds allocation causes a “crowding in” in G7, while causing a “crowding out” in ASEAN. That is, debt impact relies mostly on the way each group allocates the debt funds, and how much the governments of these countries puts in to increase economic activity. In this regard, it seems that G7 countries uses government deficit spending to boost economic activities, which creates opportunities for businesses to increase their operations towards profitability. Thus, the private sector crowds in to satisfy increasing consumer needs. In his seminal work,

Friedman (1978) argued that the debt-financed deficits need not "crowd out" any private investment, but to "crowd in". He adds that the difference between "crowding out" and "crowding in" are determined not only by the type of projects the government invest in but also by the government's choice of debt instrument for financing the deficit that, which he includes three assets - money, government bonds, and real capital. That is, debt management policy can take its place in augmenting the potency of fiscal policy, or in improving the trade-off between short-run stimulation and investment for long-run growth.

This trend indicates that much of the accrued debt by the government is spent on consumption rather than capital formation or investments, a case synonymous with the developing countries as aforementioned and confirmed by Aschauer (2000). Similarly, in most developing countries, debt whether public or private is mostly used for consumption rather than capital formation. As such, a rise in debt causes a decrease in the gross fixed capital formation. Sassi and Gasmi (2014) for example noted that if much credit is given to households rather than to firms, the net effect is a reduction in the GDP which by extension lowers the GCF, a trend common in the developing countries. Simone et. al. (2012) point out that an increase in the level of government debt may depress investment in ASEAN countries. Since both the domestic and foreign investors start to cast doubts on the government's readiness and ability to pay off the government debt

Table (3) also reports the results for other control variables for G7 countries, which shows the expected positive relationship between investment and government spending, HDI, and population. Surprisingly, Table (4) for ASEAN countries reports a positive impact of government spending and inflation on domestic investment.

Table 3 GCF (Investment) in G7 Countries

Independent Variables	1	2	3	4
Debt	.0272***	.0772**	-.1373***	.0945*
	.0071	.0368	.0277	.0382
GOVT	.6543***	.6588***	1.141***	.0543
	.1464	.1476	.1886	.1206
HDI	.3178**		-.0369***	.0543
	.1234		.9176	.0704
Inflation	-.5321***	-.3570*	.5230***	-.4116
	.1114	.2145	.1081	.2259
Population	.5900	1.366**	.5182	.0057
	.3965	.6784	.0375	.5378
GDPPC	.2596***	.3981***	.2499***	.1786
	.0611	.1202	.0578	.1244
FDI	.0405	-.0373	-.0590	.0252
	.0460	.1017	.0437	.1006
Trade	-.1746***	-.0886***	-.1738***	-.0560***
	.0212	.0161	.0201	.0168
Education expenditure		-1.040***		
		.3155		
Health expenditure		.0005		
		.1198		
Debt * education expenditure		.0071**		
		.0033		
Government spending * Debt			.0058***	
			.0014	
Debt * governance				-.0828***
				.0285
Constant	9.200*	36.74***	1.474***	44.94***
	5.203	4.800	5.570	10.04
R square	0.65	0.56	0.61	0.39
Observation	133	133	133	133

Note: *** indicates the significance level at 1% significant level. ** indicates the significance level at 5% significant level. * indicates the significance level at 10% significant level.

Table 4 GCF (Investment) in ASEAN Countries

Independent Variables	1	2	3	4
Debt	-.0245	-.9851***	-.1041*	-.6472***
	.0670	.2949	.0599	.1278

GOVT	.1605*	.2330***	.7839***	.1788***
	.0838	.0833	.0759	.0828
HDI	.6846**		.3171	.1271
	.3121		.1580	.1241
Inflation	.4443***	.4253**	.3285	3.245***
	.1492	.1512	.9418	.71211
Population	.9009***	.8226**	.5322***	.7237**
	.3313	.3295	.1620	.3318
GDPPC	3.340***	.3981***	.2499***	.1224
	.5861	.1202	.0578	.2033
FDI	.2286	.0373	.0590	.0252
	.2533	.1017	.0437	.1006
Trade	-.1686	-.1976	-.1382	.1224
	.2065	.0203	.0995	.2033
Education expenditure		-1.406*		
		.8138		
Health expenditure		.0115		
		.0203		
Debt * education expenditure		.0698***		
		.0153		
Government spending * Debt			-.0101***	
			.0011	
Debt * governance				.4505***
				.1463
Constant	38.75**	66.68***	1.930	47.43***
	12.01	15.53	10.69	14.73
R Square	0.70	0.71	0.68	0.73
Observation	105	105	105	105

Note: *** indicates the significance level at 1% significant level. ** indicates the significance level at 5% significant level. * indicates the significance level at 10% significant level.

6.3. Analyzing the Foreign Direct investment

Table (5) and Table (6) illustrates the result of the third specification where the FDI is the dependent variable. The high levels of debt in G7 does not threaten away foreign investors because of the very low risk on defaulting on the debt. The result is not consistent with by Aschauer (2000). Using the case of the United States, he argues that unlike the developing countries, developed countries use public debt as productive capital which usually lead to an increase in FDI in these countries. For ASEAN countries, one can argue that this group of countries are moving in the right direction and these levels of debt does not harm the health of these economies

In addition, the only control variables that have impact on FDI is interest rates. However, they have a positive relation with FDI in ASEAN, and a negative relation in G7. These results need a further investigation on the sources of funding of the foreign investment and operations in both groups. While the results may suggest that international companies may turn to domestic funding in G7, they do not use domestic funding in ASEAN.

Some countries have regulation that does not allow foreigners to fund their business from domestic banks. If this is the case, as interest rate increases in ASEAN countries, international companies find it more profitable to invest in there.

For ASEAN countries, inflation contributes in attracting foreign investment to them. In fact, inflation might contribute to revitalize the economic movement thus will attract foreign investors to invest in those countries. This result is in line with Sayek (2000), where he notes that multinational enterprises have developed a smoothing mechanism that allows them to switch production between two host countries to help

them avoid the possible economic shocks. Therefore, an increase in FDI in ASEAN nations amidst increasing inflation rates is attributable to this smoothing effect.

GDP per capita also contributes in attracting foreign investment to ASEAN countries.

Easy to explain, foreign investor are looking for a certain level of income that boost the purchasing power of the people.

Table 5 FDI in G7 countries

Independent Variables	1	2
Debt	.0078	.0082
	.0055	.0090
GOVT	.1030	.0147
	.0071	.0992
GCF	.0180	.0101
	.0691	.0687
Inflation	-.1871	-.2134
	.1790	.1766
Population	-.5277	-.6215
	.4467	.4416
HDI	.4455	.1166*
	.7264	.1800
GDPPC	.832	.0282
	.1024	.1026
Trade	.0028	.0039
	.0138	.0139
Interest rates		-.6165**
		.2395
Constant	4.543	5.628
	7.022	9.058
R square	0.29	0.48
Observation	133	133

Note: *** indicates the significance level at 1% significant level. ** indicates the significance level at 5% significant level. * indicates the significance level at 1% significant level.

Table 6 FDI in ASEAN countries

Independent Variables	1	2
Debt	-.0284	-.1140***
	.0267	.0431
GOVT	.0129	.0213
	.0342	.0346
GCF	.0367	.0152
	.0407	.0410
Inflation	1.343	1.568**
	.6106	.6103
Population	.1656	.1692
	.1369	.1428
HDI	.0853*	.0070
	.0335	.0042
GDPPC	.4404	.2982
	.2683	.2694
Trade	-.0902	-.0911
	.0826	.0820
Interest rates		.7422**
		.3118
Constant	5.854	9.183*
	5.039	5.112
R square	0.41	0.41
Observation	105	105

Note: *** indicates the significance level at 1% significant level. ** indicates the significance level at 5% significant level. * indicates the significance level at 10% significant level.

6.4. Analyzing the (HDI) Estimation

Table (7) and (8) report the results of various specifications where the HDI is the dependent variable. It reports the impact of government debt on HDI in the G7 countries.

The HDI is used to measure the economic development and welfare of a country. According to the United Nations Development Programmer (UNDP), HDI is a composite index that encompasses three major factors; mean years of schooling, life expectancy, and gross national income per capita (UNDP, 2016). In addition to these factors, HDI also involves other measures such as “inequality-adjusted HDI discounts the HDI according to the extent of inequality, gender Development Index compares female and male HDI values, gender Inequality Index highlights women’s empowerment, and the Multidimensional Poverty Index measures non-income dimensions of poverty” (UNDP, 2016). From these assertions, therefore, it can be concluded that government debt amongst the G7 countries is efficiently allocated to the sectors related to education, health care and other development projects that can promote the living standards of the people. Government spending could be an important variable influence HDI. Figure 7 indicate to HDI ranking in G7 countries.

Several channels are identified through which debt can have a bigger impact on growth. The model for G7 notes that an increase in either government expenditure, education expenditure or an improvement in governance level leads to better impact of debt on HDI. This is, in fact, a support of the impact of efficient allocation of the debt funds to sectors which can promote health, education, and higher income levels such as transfer levels.

Several other factors contribute positively to HDI, such as government spending, trade, investment, and GDP per capita.

On the other hand, the inflation negatively influences human development index in G7 countries. Our analysis for inflation in G7 countries indicate higher level of inflation is harmful for HDI, as it lowers purchasing power of money and raise the prices of basic services.

On the other hand, table (8) show that a negative impact of government debt on HDI in ASEAN countries. This is attributable to the use in which the funds are put into. For instance, Bilbao-Ubillos (2011) stated that HDI can be used as a significant tool for measuring the level of economic growth and development, both between the different countries or different periods for the same country. However, this assertion has been criticized by many economists such as Ravallion, Kelly, Deneulin, Neumayer, and Sagar as recorded by Bilbao-Ubillos (2011). Notwithstanding, based on Bilbao-Ubillos's argument, it is apparent that debt in developing countries do not lead to economic growth, and ultimately does not lead to any improvement in HDI factors such as health care and education. Recalling Aschauer's (2000) argument, debt in less developed countries are mostly used for consumption expenditures. Hence, it does not lead to a capital formation that may spur economic growth.

However, GCF and GDP per capita are two of our dependent variables expose that reducing government debt in the ASEAN countries significantly enhances these variable. For instance, gross capital formation similar to an increase in physical capital of nation with investment in economic infrastructures like building schools, hospital... etc in agreement with Bebczuk (2000), increasing in investment can be reason to stimulate the economy. On the other side, FDI appears not to have any significant

impact on HDI in this model. One last note is the interaction term impact of government spending on HDI. Again, the misallocation of funds seems to be a major reason of the negative impact of debt.

Based on the result, other control variables such as government spending, inflation, population growth, education expenditure, health expenditure and interest rates have insignificant impact on human development index in ASEAN countries while private credit has a positive sign that indicate to increasing in income through an employment and investment in education and health. I found several of channels promote HDI.

Table 7 HDI in G7 Countries

Independent Variables	1	2	3	4
Debt	.0001	.0001***	.0006**	.0006***
	.0001	.0001	.0003	.0001
GOVT	.0091***	.0010	.0114***	.0091***
	.0013	.0009	.0018	.0021
GCF	.0056***	.0006	.0060***	.0056***
	.0006	.0007	.0007	.0006
Inflation	-.0062***	-.0049***	-.0063***	-.0048**
	.0010	.0017	.0010	.0011
Population	-.0011	-.0087	-.0010	-.0030
	.0038	.0057	.0038	.0038
GDPPC	.0023***	.0041***	.0023**	.0021***
	.0005	.0010	.0005	.0005
FDI	.0001	.0001	.0002	.0001
	.0004	.0008	.0004	.0004
Trade	.0022***	.0007***	.0022***	.0020***
	.0001	.0001	.0001	.0001
Education expenditure		.0017		
		.0013		
Health expenditure		.0115		
		.0203		
Debt * education expenditure		.0102***		
		.0017		
Government spending * Debt			.0001***	
			.0001	
Debt * governance				.0003***
				.0001
Constant	.474***	.7304***	.4203***	.4414***
	.0300	.0342	.0433	.0393
R Square	0.50	0.44	0.48	0.56
Observation	133	133	133	133

Note: *** indicates the significance level at 1% significant level. ** indicates the significance level at 5% significant level. * indicates the significance level at 10% significant level.

Table 8 HDI in ASEAN Countries

Independent Variables	1	2	3	4
Debt	-.0015***	.0001***	-.0012***	.0020***
	.0002	.0001	.0002	.0002
GOVT	-.0002	.0001	.0028***	.0001
	.0003	.0003	.0006	.0003
GCF	.0023***	.0012***	.0030***	.0019***
	.0003	.0004	.0003	.0003
Inflation	.0029	-.0027	.0135***	.0059
	.0066	.0061	.0065	.0058
Population	-.0012	.0008	.0014	.0001
	.0014	.0013	.0013	.0012
GDPPC	.0161***	.0080***	.0167***	.0074***
	.0023	.0028	.0021	.0025
FDI	.0022**	-.0004	.0014	.0011
	.0010	.0010	.0009	.0009
Trade	-.0006	-.0003	-.0006	.0004
	.0008	.0008	.0008	.0007
Education expenditure		.0025		
		.0032		
Health expenditure				
Debt * education expenditure		.0002***		
		.0001		
Government spending * Debt			-.0001***	
			.0001	
Debt * governance				.0012***
				.0005
Constant	.4000***	.5541***	.4080***	.4496***
	.0352	.0661	.0325	.0319
R Square	0.75	0.80	0.79	0.82
Observation	105	105	105	105

Note: *** indicates the significance level at 1% significant level. ** indicates the significance level at 5% significant level. * indicates the significance level at 10% significant level.

Chapter 7

Conclusion

This study investigates the impact of government debt in G7 and ASEAN countries on various economic and wellbeing indicators such as growth, investment, FDI and HDI, using a large panel data during the period from 1995 to 2015. In addition, the study utilized various interaction terms, such as education, government spending, and institutional quality to define the impact of government debt on growth.

While the results indicate that government debt contributes positively to the GDP growth, investment, and HDI, it has an adverse effect on ASEAN countries economies. It also appears, for the most part, that an increase in public spending and improvement in the quality of institutions boost the impact of debt on growth and investments and promote a better HDI for both G7 and ASEAN countries.

The results of this study, along with previous empirical evidence, suggest that the impact of debt on various economic indicators basically depends on several factors such as the “threshold”, “allocation”, “governance”, and “crowding in” vs. “crowding out” effects.

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Appendices

The following tables indicate to the correlation Matrix between the variables in ASEAN countries and G7 countries .It seems there is no serious collinearity problem.

Table 9 Correlation Coefficient Matrix between variables in ASEAN Countries

	POP	GD PPC	GG C	GC F	Tra de	infla t~n	FDI	Gov' debt	HDI	priv c	inte rest	Healt hex	Educ tex
POP	1												
GDP PC	0.0 206	1											
GG C	0.40 69	- 0.09 56	1										
GCF	0.21 49	- 0.34 69	0.29 05	1									
TRA DE	- 0.09 07	- 0.42 18	0.02 05	- 0.13 26	1								
Infla tion	- 0.16 58	- 0.28 93	0.12 61	0.48 96	- 0.03 87	1							
FDI	- 0.14 84	- 0.00 12	0.01 57	- 0.16 88	0.18 62	0.11 29	1						
Gov' debt	- 0.02 78	0.19 81	0.03 20	0.50 93	- 0.18 87	0.40 48	- 0.29 18	1					
HDI	0.06 45	0.19 86	0.05 61	0.21 59	- 0.39 39	0.26 50	- 0.34 03	0.396 5	1				
PRI VC	- 0.08 41	0.40 97	- 0.19 89	0.07 57	- 0.40 07	- 0.02 14	- 0.20 64	0.033 7	0.51 05	1			
Intre st	0.21 45	0.06 60	- 0.13 04	0.09 86	0.09 85	- 0.02 84	- 0.01 30	- 0.044 3	- 0.03 92	0.07 31	1		
Heal tex	0.01 80	- 0.03 99	0.02 99	0.03 21	0.02 45	- 0.05 56	0.01 31	- 0.076 6	- 0.01 84	- 0.09 40	0.08 85	1	
Educ atex	0.02 81	0.41 20	- 0.10 33	0.11 36	- 0.46 91	- 0.01 23	- 0.23 05	0.008 5	0.49 04	0.27 62	0.10 70	0.075 4	1

Table 10 Correlation Coefficient Matrix between variables in G7 Countries

	POP	GDP PP C	GG C	GC F	Trade	infl at- n	FDI	Gov' debt	HDI	Edu cate	hea lthe	inte rest	pri va c
POP	1												
GDP PC	- 0.0 853	1											
GG C	- 0.0 180	- 0.24 21	1										
GCF	- 0.0 580	0.11 07	- 0.1 011	1									
TRA DE	- 0.0 273	0.06 17	0.5 165	- 0.3 914	1								
Infla tion	0.2 676	0.14 68	- 0.1 036	- 0.2 852	0.2 040	1							
FDI	- 0.1 262	0.07 29	0.0 630	0.0 095	0.0 204	- 0.08 96	1						
Gov' debt	- 0.2 467	- 0.21 54	0.3 356	0.1 102	0.0 276	- 0.28 42	- 0.0 580	1					
HDI	0.2 436	- 0.13 80	0.0 246	- 0.1 458	0.2 025	- 0.05 20	- 0.0 980	0.02 99	1				
Educ ate	- 0.1 053	0.07 31	- 0.4 632	- 0.1 032	- 0.0 090	- 0.00 39	- 0.1 263	- 0.47 09	- 0.0 688	1			
Heal th	0.0 249	0.30 49	0.1 153	0.0 204	- 0.2 211	0.25 48	0.0 400	- 0.40 43	- 0.5 539	- 0.05 31	1		
Intre st	- 0.0 660	0.20 11	- 0.3 632	- 0.0 062	0.0 852	- 0.18 99	0.1 456	0.25 17	0.2 010	0.19 13	- 0.23 83	1	
Priv ac	0.5 260	- 0.03 27	- 0.1 085	- 0.0 738	- 0.2 454	0.28 16	0.1 665	- 0.10 53	0.3 864	0.03 58	- 0.01 70	.169 9	1

Figure (1) and (2) government debt in G7 countries

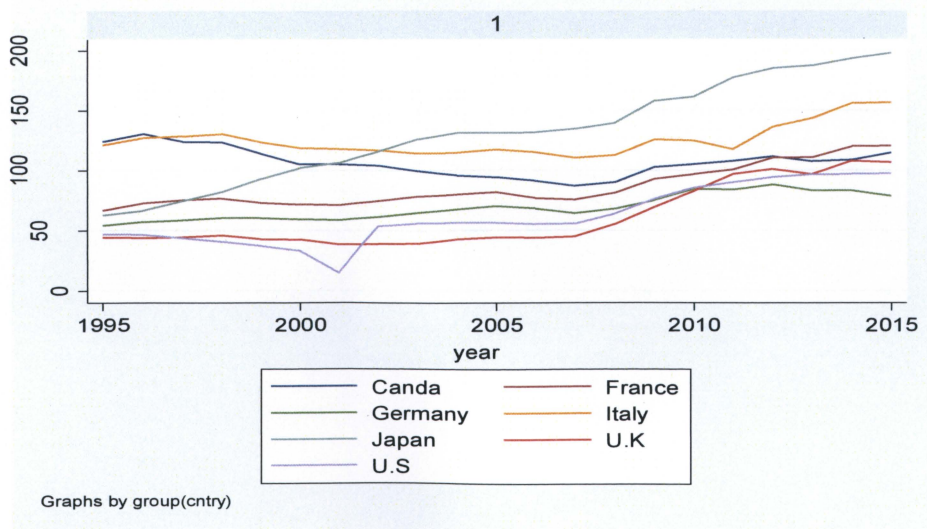
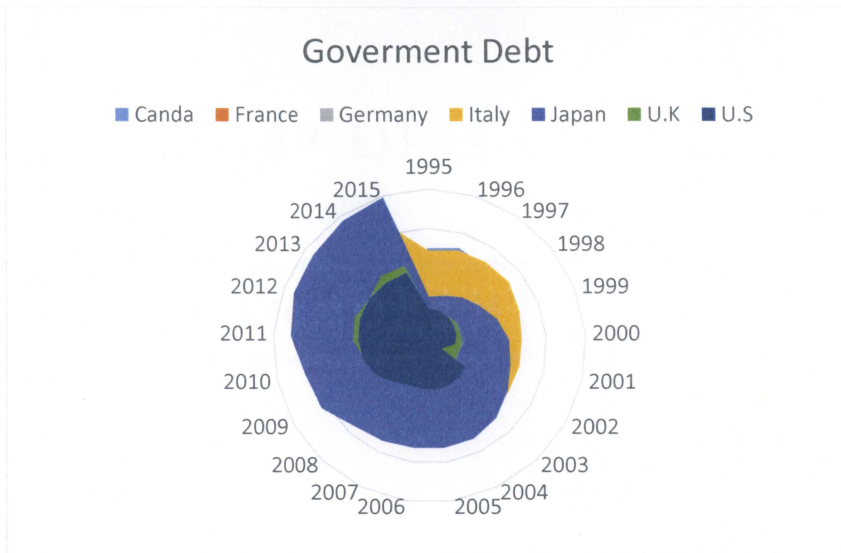
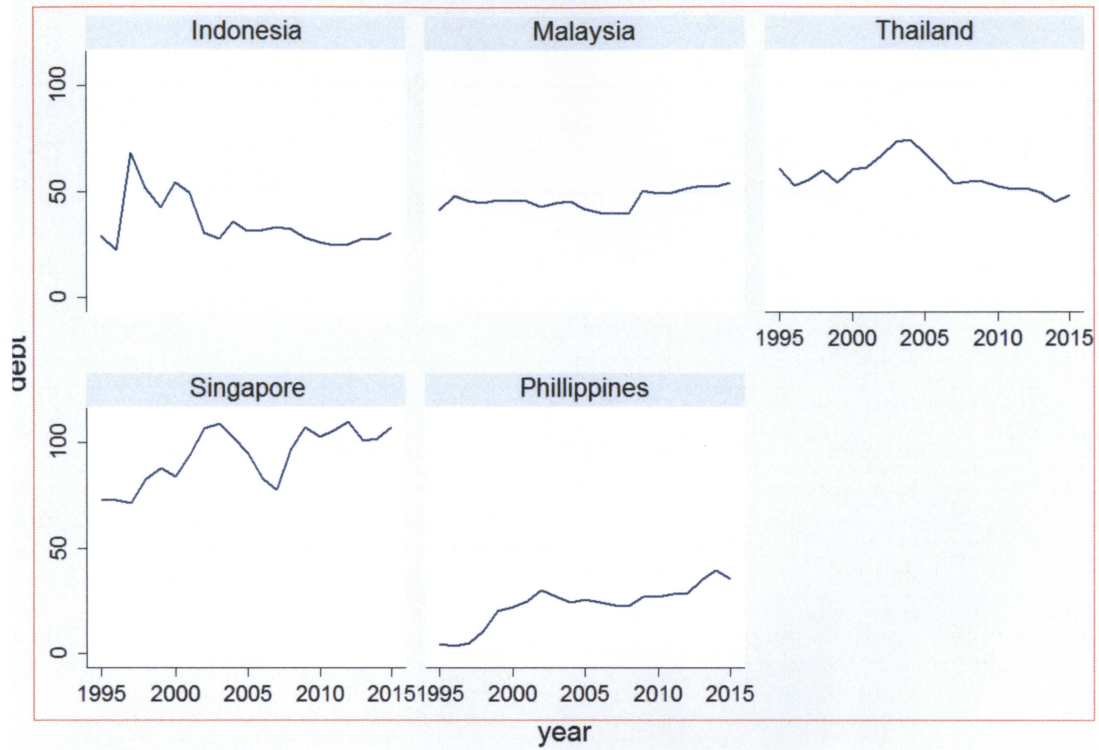


Figure (3) government debt in ASEAN countries



Graphs by group(country)

Figure 4 Gross Capita Formation (Investment) in G7 countries

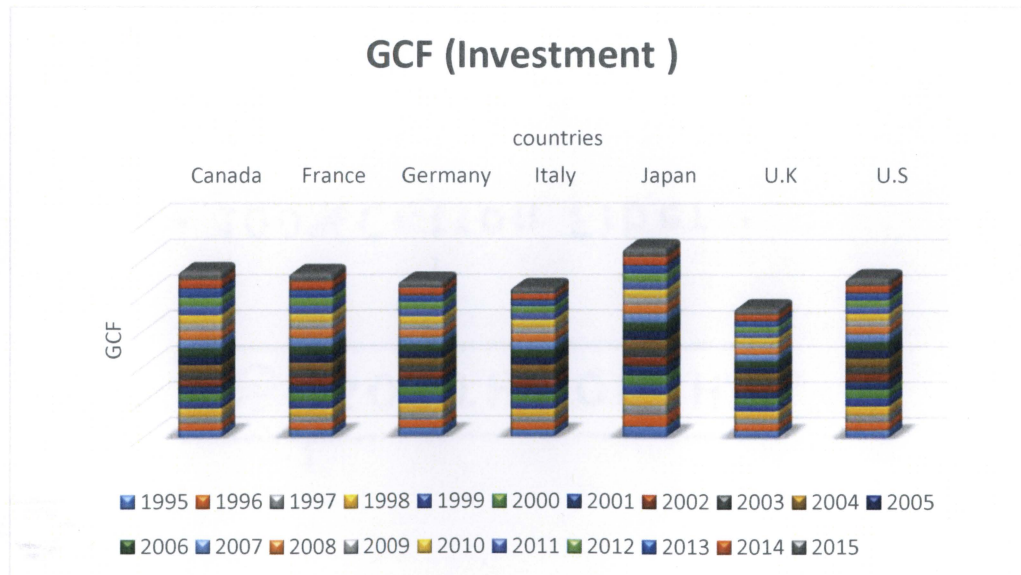


Figure 5 Gross Capita Formation (Investment) in Malaysia

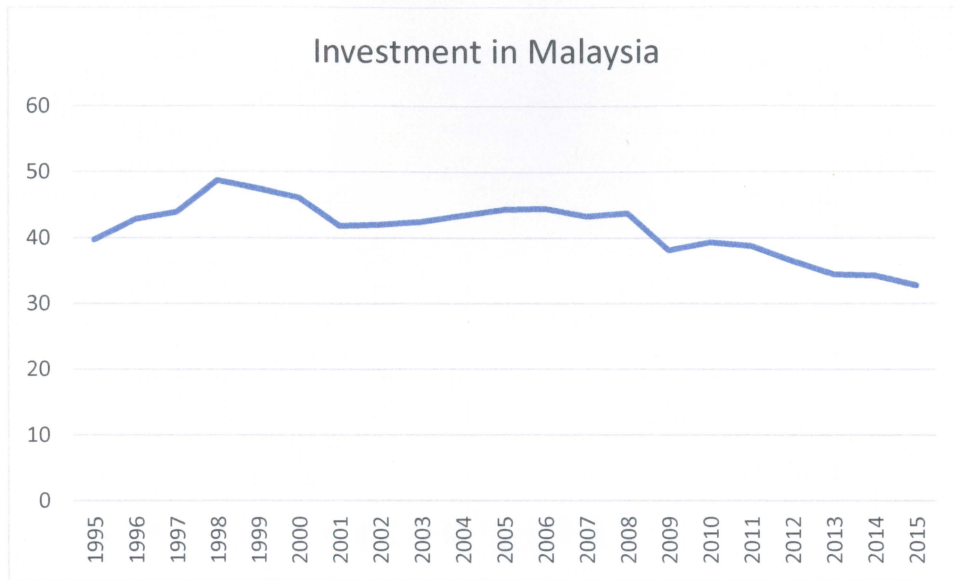


Figure 6 Gross Capita Formation (Investment) in Thailand



Figure 7 Human Development Index (HDI) in G7 countries

