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**FINANCIAL DEVELOPMENT AND ECONOMIC GROWTH: EVIDENCE  
FROM PANEL DATA**

**By**

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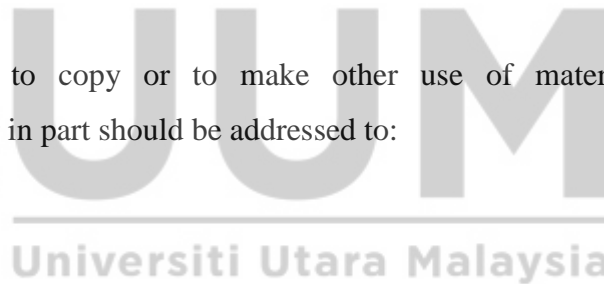
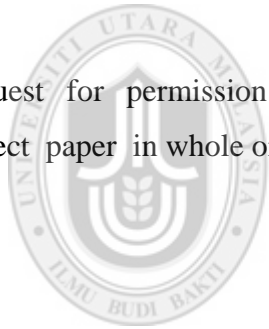
**UUM**  
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## ABSTRACT

*This study examines the relationship between financial development and growth in ASEAN by using panel ordinary least squares and causality analysis. In this study gross domestic products (GDP) is used to represent growth and the ratio of money supply to GDP represents financial development. There are also other variables such as exchange rates, foreign direct investment (FDI) and total population are being used as independent variables. Panel Ordinary Least Squares (POLS) had been used to investigate the relationship between growth and financial development and we found that all the independent variables in this study generally have significant relationship with growth. In addition, this study conducted Granger causality test and the test results confirmed that a unidirectional causal relationship exists between foreign direct investment and population has causal impact which run from foreign direct investment to population. There is also a unidirectional causal relationship can be found to exist running from the exchange rate to financial development. Finally in conclusion, in order to improve growth of the country, government as a policy maker play an important role to encourage investment by providing or upgrading infrastructures and facilities in order to generate more opportunities furthermore to create competition and productivity in the economy.*

Keywords : Financial development, economic growth, ASEAN

## ABSTRAK

*Kajian ini mengkaji hubungan antara pembangunan kewangan dan pertumbuhan di dalam ASEAN dengan menggunakan panel biasa dua terkecil dan analisis sebab dan akibat. Dalam kajian ini produk dalam negeri kasar (KDNK) digunakan untuk mewakili pertumbuhan dan nisbah bekalan wang kepada KDNK merupakan perkembangan kewangan. Terdapat juga faktor-faktor lain seperti kadar pertukaran, pelaburan langsung asing (FDI) dan jumlah penduduk yang digunakan sebagai pembolehubah bebas. Panel Biasa kuasa dua terkecil (pöls) telah digunakan untuk mengkaji hubungan antara pertumbuhan dan perkembangan kewangan dan kami mendapati bahawa semua pembolehubah bebas dalam kajian ini umumnya mempunyai hubungan yang signifikan dengan pertumbuhan. Selain itu, kajian juga menjalankan Granger ujian sebab dan akibat serta keputusan ujian mengesahkan bahawa hubungan sebab dan akibat yang satu arah wujud di antara pelaburan langsung asing dan penduduk mempunyai kesan sebab dan akibat yang berjalan daripada pelaburan langsung asing kepada penduduk. Terdapat juga hubungan sebab dan akibat yang satu arah boleh didapati wujud berjalan dari kadar pertukaran untuk pembangunan kewangan. Akhir sekali, kesimpulannya untuk meningkatkan pertumbuhan di negara ini, kerajaan sebagai pembuat dasar memainkan peranan penting untuk menggalakkan pelaburan dengan menyediakan atau menaik taraf infrastruktur dan kemudahan bagi menjana lebih banyak peluang pula untuk mewujudkan persaingan dan produktiviti dalam ekonomi.*

**Kata kunci :** Pembangunan kewangan, pertumbuhan ekonomi, ASEAN

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## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1 Definition of financial development**

Theoretically, in order to ensure the economic growth is promoted and poverty is reduced, a well-functioning financial system is needed. Levine in 2005 recognized the functions of financial sector under five broad categories. First, produce information about potential investment opportunities. Second, mobilize savings to the most productive investment. The third category is by monitoring firms and exerting corporate governance. Fourth, promote risk diversification and sharing across individuals, firms, and countries. Finally, facilitate the exchange of goods and services. Every function possibly will encourage savings and investment decisions which lead to economic growth. In this scenario, banks are the intermediation agents between savings and investment. Hence, the efficiency of the banks and financial markets are taken into account, as it allows to attract deposits and to channel them in a professional way towards productive opportunities.

##### **1.1.1 Background of study**

Over recent years, the relationship between financial development and economic growth has been a major subject in the field of development economics. The basic of this relationship has actually been detected as early as 1911, which was discovered by Joseph Schumpeter. He believed that financial intermediaries that provided services such as monitoring managers, risk managements, mobilized savings, facilitating

transactions, risk managements, and project evaluations are crucial for technological innovation and economic growth. It was not stop there as the empirical research done by Goldsmith (1969) and McKinnon (1973) respectively revealed on the relationship exist between financial and economic growth for a few countries. Furthermore, there are numbers of literature also exists on relationship between financial development and economic growth (Shahbaz and Rahman, 2012; Alkhuzaim, 2014; Onuonga, 2014; Vazakidis & Adamopoulos, 2011; Anwar & Nguyen 2011). However, the studies made on this area had come out with arguments saying that finance is a mechanism to economic growth (Rousseau and Wachtel 2000; King and Levine 1993) or known as supply-leading hypothesis. Briefly, it works in two different ways: first, by transferring resources from customary low growth sectors to modern high growth sectors and, second, by motivating the enterprises' response to the modern sectors. The other hypothesis is demand- following hypothesis in which it implies that rapid growth of real national income will give impact to the request made by enterprises for external funds and therefore financial intermediation, since in most situations firms will be less able to develop. However, Greenwood and Smith (1997) in their study state that the bidirectional causality exist between financial development and economic growth. King and Levine (1993) state the financial intermediaries obtain information about the quality of individual projects that is not readily available to private investors and public markets. Levine (1997) suggested that financial development stimulates economic growth through the two 'channels' of capital accumulation and technological innovation. Financial markets evaluate the potential innovative projects, and finance through efficient resource allocation.

## 1.2 Problem statement

Asia was one of the most rapid growing economies and developed its assimilation with the global economy from the 1960s to 1990s especially for Taiwan, Hong Kong, Korea and Singapore. The key factors that influence economic growth are because of the stability in macroeconomics environment such as balanced fiscal policy, low inflation rates, and a large amount of foreign exchange. Although in the year of 1997 most of the Asia countries were affected by financial crisis, however in the year of 2006 the overall GDP reported to increase up to 61 percent compared to 38 percent in 1996. Indirectly, the increase of ratio in GDP implies that a nation's overall economic activity is getting better. Hence, we believed that why there were so many empirical researches had been conducted to explore how economic growth and financial development related to each other. Fase and Abma (2003) indicate that for Asian countries, the development that occurred is different from that other region. Besides that, Hsueh, Hu and Tu (2013) in their research to analyse among ten Asian countries regarding the causality between financial development and economic growth found that especially in China, the variables of financial development caused the economic growth. In addition, research done by Pradhan, Mukhopadhyay, Gunashekar, Samadhan and Pandey (2013) using 15 Asian countries for the period of 1961 to 2011 suggested that social development and financial development generally lead to economic growth. However, the findings are not uniform and vary from country to county and region to region. Although we can see that there is similarity such as the financial development contributes to the economic growth, however the results may different to some other countries. Furthermore, the choice of variables that represent the financial development in each research might give different results from each other. Hence, the aim of this study is to explore the existence of relationship between

variables that have been selected in this study and whether the variables contribute to the economic growth based on selected countries as well as to confirm if the variables are vary to some other countries. Furthermore, this study may also help to confirm which theory that it will follow either the supply-leading theory or demand-following and else bi-directional.

### **1.3 Research question**

This paper re-examines the nature of the relationship between financial development and growth, specifically on the following questions:

1. Is there any relationship between financial development and growth for ASEAN countries selected?
2. Does relationship between foreign direct investment and growth exist?
3. Does exchange rate and economic growth have relationship?
4. In this study, is there any relationship between population and economic growth?

### **1.4 Objectives of the study**

1. To analyse the existence of relationship between financial development and economic growth.
2. To investigate whether exist relationship between foreign direct investment and economic growth.
3. To examine the relationship between exchange rate and economic growth.
4. To analyse if relationship between population and economic growth exist.

### **1.5 Scope of study**

The study of the relationship between financial development and economic has been one of the most important fields in economics. This research focuses on determining the casualty relationship between financial development and economic growth for selected ASEAN countries over the period of 1995 to 2013.

### **1.6 Limitation of the study**

There are several limitations met while conducting this research. The first limitation is the availability of data. At first, this study is planned to focus on the ASEAN countries, due to data is limited for certain countries such Brunei, Laos, Myanmar and Cambodia hence the countries was dropped to avoid the inconsistence results while running the data. Furthermore, there are countries that data is not available for certain years. In fact, there are many countries that the study should have included in the sample. Therefore, the results limited to only the countries investigated and do not represent the other countries. In order to get more convincing and precise result a large sample should be used which includes a number of countries.

### **1.7 Significance of the study**

The investigation of financial developments and growth helps one country to ensure corrective plans for further developments. For example, if the financial development has a significant in influencing the economic growth, government as main policy maker in a country should highlight and set the prioritization towards the development of financial markets. Besides that, economic growth in Asian countries also can be promoted by focusing the development in financial sectors, creating new instruments,

institutions and organizations to provide more financial resources. Hence, to ensure such activities, it is crucial for the government to ensure broad access is facilitated as to increase the expansion the availability of the range of financial services to a broader set of households, firms and sectors in the economy for developed markets.

### **1.8 Organization of the study**

This paper is organized into five chapters. It is arranged as follows:

Section I consist of definition of financial development, background of the study, problem statement, research questions, objectives of the study, scope of study, limitation of the study and significance of the study.

Section II comprises of literature review which can be divided into two parts: the theoretical and the empirical parts.

Section III consists of modelling framework, estimation strategy and data collection.

The results and the interpretation are discussed in Section IV.

Finally, Section V presents the conclusion and policy implication of the study.



## CHAPTER TWO

### LITERATURE REVIEW

#### 2.1 Introduction

This chapter reviews the related literatures and it is divided into two parts: section one discusses on the theoretical studies and the second part is related to empirical studies on the relationship between financial development and economic growth.

#### 2.2 Theoretical review

Many theoretical studies investigated the association between financial development and economic growth. In the early 1990s, King and Levine (1993) state that the awareness of financial development promoting economic growth has been explored by John Schumpeter. This is continued by Mckinnon (1973) disclosed that financial development is one component that help economic growth.

The distributions of the theories can be divided into three parts. The first part is related to the theory of demand-following hypothesis which generally can be defined as finance is an instrument to economic growth (Rousseau and Wachtel 2000; King and Levine 1993; Jalil and Ma 2008). The second part is related to demand-following hypothesis. It can be defined as growth led to financial development (Tekin 2012; Liang and Teng 2005). Finally, it can be said that the existence of both demand-following hypothesis and supply-leading hypothesis which study done by Calderon and Liu (2003).

### 2.3 Previous empirical work

Halkos and Trigoni (2010) in their research to discover relationship between finance and growth in the European countries found that in short run, the financial system does not directly impact growth. However in the long run, the relationship between financial system and growth is detected. In order to estimate vector autoregressive models, they conducted the Akaike information criterion (AIC) and the Schartz criterion (SC) criteria and cointegration test. Im, Pesaran and Shin (IPS) test was used to test for stationarity. In this research, the growth of real sector is expressed by the real GDP per capita growth, while the size of the financial system by the ratio of domestic credit to GDP. Two variables are used as the indexes of monetary policy, deposit rate (DR) and inflation (INF). The International Monetary Fund is used to collect data for the period of 1975-2005 and expressed in real 2,000 prices.

Sehrawat and Giri (2015) analyse the relationship between financial development and economic growth. 28 Indian states involved in this research and data is collected over the period from 1993 to 2012. Two variables that represent financial development, there are CR, which is the ratio of credit amount as a share of the state's output (gross state domestic product) in the same state (2) PD, which is the ratio of deposit amount as a share of the state's output (gross state domestic product) in the same state. However, economic growth is measured per capita gross state domestic product (PGSDP) and number of scheduled commercial bank branches has been used in the study to represent development in the financial sector. By using Pedroni's panel co-integration test to examine the long run, this empirical results confirm that there exists a long run co-integration relationship among the variables. The fully modified OLS (FMOLS) results shown that a sensitivity of credit-output, deposit-output is positive and statistically significant. Conversely, the results of panel Granger causality suggest

that there exists unidirectional causality from per capita credit to the economic growth and the number of bank branches per capita deposit to economic growth and bi-directional causality between per capita credit and per capita deposit. Hence, the number of bank branches is insignificant variable in explaining economic growth.

Oriavwote and Eshenake (2014) from their study indicate that mixed performance is showed between financial sector development and economic growth in Nigeria. By using interest rate, minimum capital base, liquidity ratio, credit to the private sector and financial deepening (computed as the ratio of broad money supply to Gross Domestic Product) as variables, the results showed that in Nigeria, the financial sector development has not significantly favoured the expansion of the private sector. This is maybe due to poor performance of private sectors in that country. Compared to previous research, they used The Johansen cointegration test in order to test for the existence of a long run relationship among the variables and resulted there is a long run relationship among the variables. From the diagnostic test, result revealed that the residuals are stable, normally distributed and not serially correlated.

Onuonga (2014) in her research Financial Development and Economic Growth in Kenya over the period 1980 until 2011 resulted to accept both the supply leading, and demand following hypotheses. This means that financial development hastens and enlarges economic growth in Kenya and that economic growth leads to development of the financial sector in Kenya. In this research, the researcher used autoregressive distributed lag (ARDL) bounds testing approach for co integration analysis to test for long-run and short-run parameters. Besides that, Granger causality analysis was done in order to identify the direction of causality. The empirical outcomes found that in Kenya, there is a stable long-run relationship among, financial development, trade openness and economic growth. In addition, she also found that financial

development has a significant positive effect on economic growth. The ECT coefficients advocate that the speed of adjustment in each of the estimated model is very high. The Granger causality tests exhibited that there is bi-directional causality between financial development and economic growth in Kenya for the period under study.

Salari, Hassanzade and Ebrahimpour (2014) evaluated the relationship between financial development and economic growth in Iran in which the main goal is to identify the long term relationship. Data information was taken from the population of Islamic republic of Iran economic information year 1981 to 2011. In order to estimate the long run relationship and long run dynamic parameters of the model, The ARDL and bounds testing approach to integration was used. The test recommended that there exists an integrating relationship variables.

The empirical study done by Alkhuzaim (2014) investigates the long-run relationship and the direction of causality between the financial development and economic growth in Qatar over the period 1990 to 2012. Indicators that represent financial development included a broad money supply (M2), bank credit to the private sector and domestic credit provided by bank sector. In this research, the researcher used the co-integration technique and Granger causality test based on the Error Correction Model (ECM). The results from this study can be concluded into three parts. First, a positive long-run equilibrium relationship exists between all three financial development indicators and the growth rate of real GDP by using the co-integration analysis. Second, the error correction model (ECM) was used to determine the direction of causality which confirmed a bidirectional causal relationship exist between the broad money supply to GDP and the growth rate of real GDP in the long run. In the meantime, relationship bank credits to the private sector ratio to GDP and

economic growth, the result shows that the long-run causality does not exist. Nevertheless, findings for domestic credit provided by the bank sector as percentage of GDP to the growth rate of real GDP suggest that unidirectional causality runs. Hence, in the case of broad money supply as a financial development indicator, it supports both “demand following” and “supply leading” hypotheses. However, in the case of bank credit to the private sector as a financial development indicator it doesn't support both hypotheses. The last part to summarize is in the short run, the casualty test result shows unidirectional causality running from the growth rate of real GDP to domestic credit provided by the banks sector. Conversely, the findings advocate that there is no causal relationship between the growth rate of real GDP and the two other financial development indicators.

Vazakidis and Adamopoulos (2011) investigate the relationship between financial development and economic growth for UK for the period 1965 to 2007 using a vector error correction model (VECM). The main purpose is to observe the long-run relationship between these variables relating the Johansen co-integration analysis. In this study, the independent variables are represented by the general stock market index, the domestic bank credits to private sector and the industrial production index. Granger causality tests showed that a causative relationship between financial development and economic growth for UK exist.

Anwar and Nguyen (2011) in their research financial development and economic growth in Vietnam stated that there is positive relationship between ratios of credit to GPP to economic growth. However, the relationship between the level of financial development as measured by the ratio of credit to GPP and the stock of financial direct investment on Vietnam's economic growth rate has negative and significant.

Pradhan, Mukhopadhyay, Gunashekar, Samadhan & Pandey (2013) studied on the causal link among financial development, social development, and economic growth for 15 Asian countries. The data was taken for the period 1961 until 2011. By using Granger causality test, they found that for both at the single country and panel settings financial development and social development lead to economic growth. Besides that, there is existence of relationship between financial developments to economic growth.

Shahbaz & Rahman (2012) investigate on the relationship between exports, financial development and economic growth in case of Pakistan. By applying the autoregressive distributed lag bounds testing approach to co-integration and error correction model. The test is used to test the long-run and short-run relationships. Besides that, in order to test the direction of causality between the variables, the vector error correction model Granger causality test and robustness of causality analysis is tested by applying innovative accounting approach. The result suggested co-integration between exports, economic growth and financial development as implied that exports, economic growth and financial development move in the same direction. The results propose that economic growth and financial development contribute to spur exports. The causality analysis exposes feedback hypothesis that exists between financial development and economic growth, financial development and exports, and, exports and economic growth.

An attempt to determine the causal relationship between financial development and economic growth for Egypt was undertaken by Bader and Qarn (2007) using four different measures of financial development. The first measure is money stock to nominal GDP, the ratio of M2 minus currency to GDP, to serve as second measure of financial development. the third measure chosen is the ratio of bank credit to the private sector to nominal GDP and the last measure is the ratio of credit issued to non-

financial private firms to total domestic credit (excluding credit to banks) .Granger causality tests being used to test the co-integration and vector error-correction (VEC) methodology. Data is taken from period of 1960 until 2001. From the analysis made, the results discovered a bi-directional Granger causality between economic growth and financial development in Egypt using all the financial measures.

Another study of the relationship between financial development and growth was conducted by Liang and Teng (2005) over the period 1952 until 2001. A multivariate vector autoregressive (VAR) framework is used as a suitable specification and the long run relationship among financial development and growth. Other key growth factors is analysed in a theoretically based high dimensional system by identification of co-integrating vectors through tests over-identifying restrictions. In this research, three steps were taken in order to observe the long-run relationship between financial development, growth and other growth factors. The first step is investigating the order of integration of the variables using standard tests for the presence unit root. Next, Johansen maximum likelihood is used to test the number of co-integrating vectors. The final step is the evaluation of causal relationship between financial development and growth. The empirical results suggest that a unidirectional causality exist from economic growth to financial development.

Seetanah, Ramessur and Rojid (2008) in their research is to test the hypothesis that there exists a positive link between financial development and economic growth in island economies. A sample is taken from 20 island economies over 22 years period. The selection of island economies is based on existence and availability of comparable data. As usual, the dependent variable is represented by the real per capita gross domestic product. Whereas, the independent variables are represented by investment, total of import and export, the employment level and secondary

enrolment ratio. In order to measure financial development monetary aggregates, the ratio of liquid liabilities to the country's GDP and the value of credits by financial intermediaries to the private sector are employed. Liquid liabilities include currency plus demand deposits and interest-bearing liabilities of banks and non-bank financial intermediaries. From the results, shows both indicators have a positive and significant effect on the level of economic growth. The positive linkage is also validated by using GMM panel estimates and remarkably the presence of dynamics in the modelling is detected.

By using data from 2 countries, China and Pakistan, Jalil and Ma (2008) examined comparison financial sector and their influence on relationship between financial development and economic growth. Variables are used include deposit liability ratio and credit to private sector as proxy to financial development. ARDL framework was used to empirically analyse on the results. The study found that in the case of Pakistan, there is positive and significant relationship between financial development and economic growth. However, in the China case a positive and significant relationship for deposit liability ratio and positive, but insignificant relationship for credit to private sector.

Bittencourt (2012) examines on the role of financial development in influencing economic growth in a panel of four Latin America countries between 1980 until 1997. At this time, the countries are said to experience political transitions in the 1980s and severe macroeconomic conditions in the 1980s and early 1990s. Based on panel time-series data and analysis, it confirms that the Schumpeterian prediction which advocates that finance allows the entrepreneur to invest in productive activities, and therefore to promote economic growth.



Another research done by Hsueh, Hu and Tu (2013) investigated the causality of between financial development and economic growth among ten Asian countries from the period of 1980 to 2007. To reveal different impact using four variables, domestic claim, M1, M2 and M3. In this research, the researcher had used method of bootstrap panel of Granger causality analysis. From the investigation they found that the findings in this research support the supply leading hypothesis especially in China.

Bojanic (2011) in his research choose Bolivia to study the impact on financial development and trade on economic growth during the 1940 to 2010 period. In this research, bivariate cointegrated systems and employing the methodology of cointegration analysis was used to test the hypothesis of a long-run relationship between indicators of economic growth and financial development, and economic growth and trade openness and Granger regression was used to investigate the issue of causality between the variables of interest standard Granger regressions and with error-correction models. The results show that a long-run equilibrium relationship between economic growths, financial development and trade openness indicators exist between them. In addition, unidirectional Granger causality is found running from financial development and trade openness indicators to economic growth.

In Ghana, an investigation on the long-run growth effects of financial development had been done Adu, Marbuah and Mensah (2013) suggested the growth effect of financial development is influenced by the choice of proxy used. In this research, both credit to private sector and total domestic credit are suitable variables, while broad money stock to GDP ratio is not growth-inducing.

Besides that Biswas (2008) also did the research on financial development and economic growth for 12 Asian countries. By using co-integration and causality test,

evidence shows that the finance and growth relationship differ across Asian markets. In this research, stock market development was used as an indicator represented by value-traded ratio and banking sector development represented by bank credit to private sector as a ratio of GDP.

In Kenya, Uddin, Sjo and Shahbaz (2013) had done research on relationship between financial development and growth over the period of 1971 to 2011. By using ARDL bounds testing and Gregory and Hansen's structural break co-integration, the co-integration can be found between the series in the presence of a structural break in 1992. Hence, the relationship of financial development and growth exist in the long run.

Another research also being done in to investigate the relationship between financial development and growth by Zhang, Wang and Wang (2010) at city level in China. By using 286 Chinese cities over the period of 2001 until 2006, there are three levels of cities in China which are known as municipalities, prefecture-level and country-level cities. In this research, they used GMM estimators for dynamic panel data as the same results produced by traditional cross-sectional estimators and the simpler first differenced GMM estimators. From the outcome, they proposed that there is positive relationship associated between traditionally used indicators of financial development and the economic growth.

Federici and Caprioli (2008) in their research to investigate the existence and the strength of credit channel and balance sheet effects in countries characterized by an intermediate level of financial development. This analysis used Vector-Autoregressive (VAR) in order to identify the dynamic interactions between financial development and economic growth. There are three VAR groups by using quarterly

data for a set of 39 countries and the impulse analysis had been performed. Initially, two VARs were estimated, each including three variables: spread, domestic bank credit to private sector and GDP; spread, real exchange rate and GDP. Countries affected by channel and balance sheet effects are those characterized by intermediate level of financial development. Second step involved determinants of spread dynamics. They added a new VAR, exports, inflation and growth variables and shocks to the variables influencing spread. Lastly, they also included the employment rate and focus the analysis on the role played by bank's balance sheet. Due to bank is one of the most important networks saving to investors and, therefore we estimate a VAR containing five variables: the nominal exchange rate against the US-dollar, deposit rate, lending rate, unemployment rate and GDP. From this analysis, they found that financial development is a vital variable for the presence of credit crunch effect. More financial developed countries are able to avoid currency crises.



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## CHAPTER THREE

### METHODOLOGY

#### 3.1 Introduction

This chapter can be divided into six sections. Section one discuss on the descriptions of data. Section two is related to research framework. The third section is the development of research continued with research hypothesis in the section four. Analysis on the methodology and conclusion are respectively in section five and section six.

#### 3.2 Data description

This research comprises of the panel data for selected for 6 ASEAN countries, which are Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam and plus the three major countries in East Asia (Japan, South Korea and China). In this study countries such as Brunei, Laos, Myanmar and Cambodia have been dropped due to insufficient data. The panel data are retrieved from the year 1995 to 2013 as some of the data for the countries selected are unavailable. Variables included gross domestic products (GDP), exchange rate, foreign direct investment population and financial development. Again, the items in the variables are selected based on the availability of data and as per relevance in the Asian countries. The details of these data are provided in Table 3.1.

Table 3.1  
Data Set: Key Variables, Descriptions and Sources

| NO. | VARIABLES   | DEFINITION  | SOURCES    |
|-----|---|---|------------|
| 1   | Gross domestic product (GDP)                                  | GDP per capita is gross domestic product divided by midyear population. Data are in current U.S. dollars.   | World Bank |
| 2   | Financial development   | The ratio between Money Supply and GDP<br>(M <sub>2</sub> /GDP)   | World Bank |
| 3   | Exchange rate   | This official exchange rate. (local currency units relative to the U.S. dollar).                            | World Bank |
| 4   | Foreign direct investment, net inflows<br>(BoP, current US\$) | Foreign direct investment, net inflows<br>(BoP, current US\$)   | World Bank |
| 5   | Population, total   | Total population is based on the de facto definition of population. The values shown are midyear estimates. | World Bank |

**Notes:**

All variables are transformed into their natural logarithms.

### 3.3 Panel data

In statistics and econometrics, panel data can be referred as multi-dimensional data commonly involving measurements over time. Panel data comprise observations of numerous occurrences found over multiple time periods for the same subject. A common panel data regression can be modelled as  $Y_{it} = \alpha + \beta X_{it} + \mu_{it}$  where  $Y$  is the dependant variable,  $X$  is the independent variable,  $\alpha$  and  $\beta$  are coefficients,  $i$  and  $t$  are indices for subject and time.  $\mu_{it}$  is an error term.

#### 3.3.1 Advantages of Using Panel data

There are advantages why we use panel data while conducting this research. One of the advantages are panel data provide more accurate inference of parameters. Panel data usually contain more degrees of freedom and more sample variability than cross-sectional data which may be viewed as as panel with  $T = 1$  or time series data which is panel with  $N = 1$ , hence improving efficiency of econometric estimates. Secondly, panel data is said to have greater capacity for capturing the complexity rather than a single cross-section or time series. This included constructing and testing more complicated behavioural hypotheses and controlling the impact of omitted variables. Lastly, pane data is said to have less collinearity among variables and more variability.

#### 3.3.2 Limitations

However, panel data also has its own limitations. Firstly, it has selectivity problem and collection of data. Secondly, dimension of time series is short, measurement error disruption and dependence in cross section. Lastly, a little limitations can be imposed in panels on distributed lag model than in a time series study.

### **3.4 Variables**

In assessing the relationship between financial development and economic growth, in this study variables that been used certain specific indicators to represents financial development. The justification of using this variable is as follows:

#### **3.4.1 Variable of Growth**

Following earlier studies, the real GDP per capita has been used as a proxy to economic growth. ( Biswas, 2008; Tsen, 2005; Hsueh, Hu and Tu, 2013; Herzer, 2010; Rousseau and Wachtel, 2000). The reason of using GDP per capita is because of the variable seems to be least difficult as the errors that affect GDP are also liable for distortions in population statistics. Due to this, Arestis and Demetriades (1997) stated that the impact on the ratio registering economic development for both GDP and population seem to be offset.

#### **3.4.2 Financial development indicators**

In the previous studies, researchers such as McKinnon (1973) and Goldsmith (1969) have used  $M_3$  as a proxy to 'financial depth'. However, according to King and Levine (1993) "financial depth" which commonly equals liquid liabilities ( $M_2$ ) of financial intermediaries divided by GDP has been used by many analysts in order to measure the banking sector development which represents the financial development in this study.

#### **3.4.3 Exchange rate**

In this study, exchange rate is used as an additional proxy that represents financial development. Federici and Caprioli (2008) in their research also used real exchange rate to investigate how this variable effected the economic growth. This is because the changes in exchange rate may change the supply and demand towards investments.

#### **3.4.4 Foreign direct investment**

In the preceding investigation, Herzer (2010) used FDI flows to GDP in their study for a sample of 50 countries as contribution into this field. The finding shows that outward has a strong positive impact to the economic growth. Hence, in this study FDI has been chosen to test on the relationship within Asian countries.

#### **3.4.5 Population**

Population is one variable that can be used to investigate on how it can affect the economic growth. (Savas, 2008; Tuku, Paul and Almadi, 2013)

#### **3.4 Research framework**

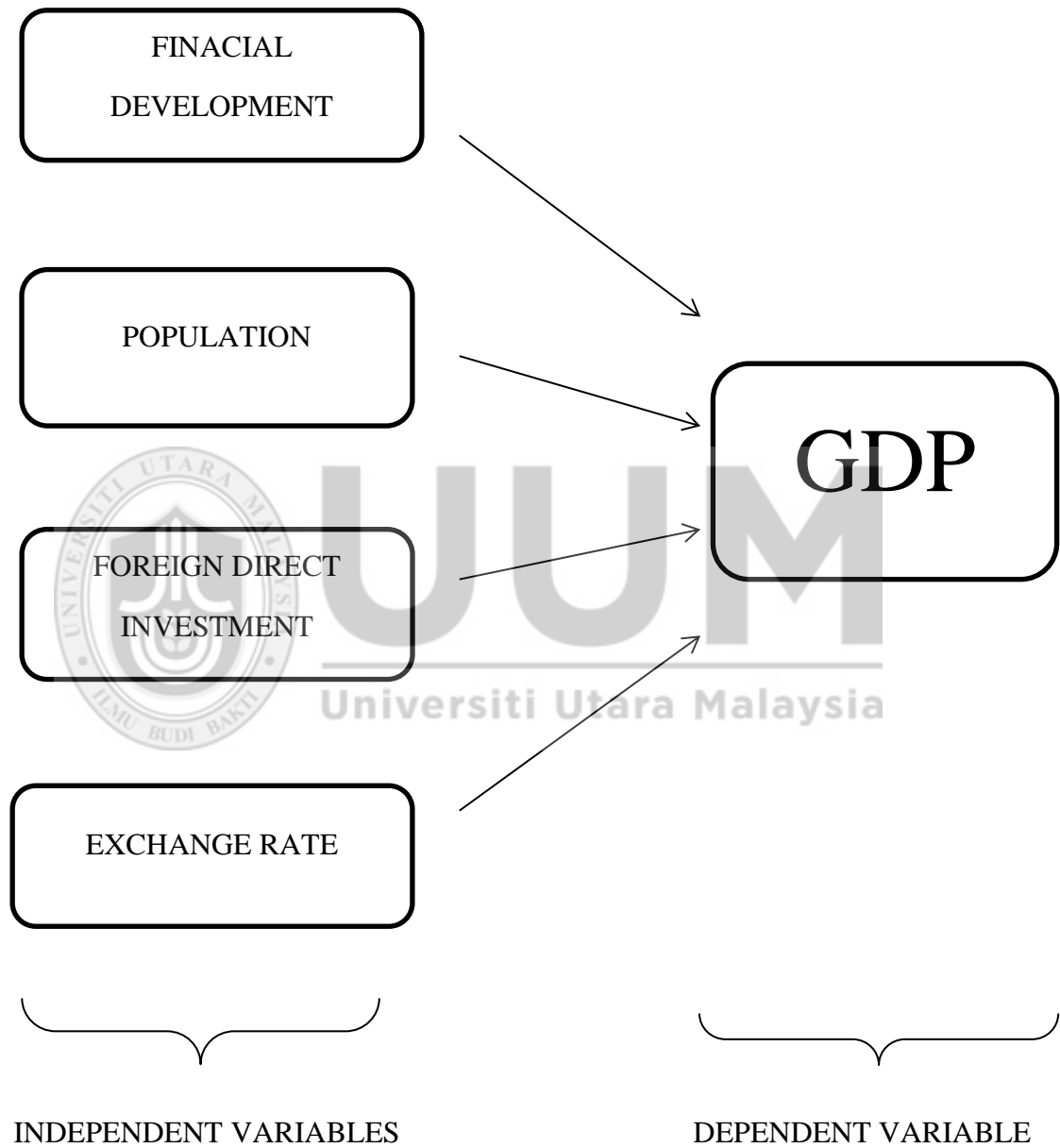
The theoretical framework can be seen in figure 3.1. This study examines the economic Growth as a function of (i)financial development (ii)population (iii)foreign direct investment (iv)exchange rate



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Figure 3.1: Theoretical Framework



### **3.5 Hypothesis development**

The study examines whether financial development could affect the economic growth. In the line of the research questions and research objectives of this study, there are four hypotheses are developed and discussed as per following sub-sections.

#### **3.5.1 Financial development**

Examining the financial development and economic growth is very important (Goldsmith, 1969; King and Levine, 1993). This is because the significant results may influence the policy made by the government. For example, if financial development and economic are correlated to each other, the government should set to prioritizing the development of financial markets. Hence from the previous empirical studies, Fase and Abma (2003) stated that in most of Asian countries, financial development is a factor that leads to economic growth. This relationship also support to the supply-leading hypothesis. This is similar to several earlier studies. (Pradhan et al. 2013; Arestis and Demetriades (1997); Jalil and Ma 2008).

*Hypothesis 1: There is a significant relationship between financial development and economic growth*

#### **3.5.2 Exchange rate**

The movement of exchange rate is said to be one factor can influence the economic growth. Habib, Mileva and Stracca (2016) state that the a real appreciation reduces the significantly annual real GDP growth. Hence, confirmed that relationship that exists between these two variables, exchange rate and economic growth. The other

study done by Khondker, Bidisha and Razzaque (2012) also state that managing the exchange rate is very crucial to country because in order to maintain external competitiveness and promoting growth, policy makers need to ensure that exchange rate which is accompanied by other consistent macroeconomics policies are managed cautiously. In conclusion, exchange rate also plays an important role in generating economic growth.

*Hypothesis 2: There is a significant relationship between exchange rate and economic growth*

### **3.5.3 Population**

Population growth encourages competition which induces technological advancements and innovations. Savas (2008) found that there is strong relationship between population and economic growth. In addition, Thuku, Paul and Almadi (2013) confirmed that the population and economic growth are both positively correlated. This is because an increase in population will impact positively to the economic growth in the country both in the short run and also in the long-run. Hence, population is one factor contributes to the economic development.

*Hypothesis 3: There is a significant relationship between population and economic growth*

### **3.5.4 Foreign direct investment**

Khaliq and Noy (2007) said that foreign direct investment is considered matters for its effect on economic growth with very few sectors showing positive impact in

Indonesia. When financial markets are well developed, the host country will benefit from the linkages between the foreign and domestic firms with positive spill-overs to the rest of the economy. Alfano, Chanda, Ozcan and Sayek (2006) said that many research suggest that in order maximize the benefits of foreign direct investment, the appropriate policies must put into attention.

*Hypothesis 4: There is significant relationship between foreign direct investment and economic growth*

### **3.6 Research hypothesis**

H<sub>0</sub> = Exchange rates, foreign direct investment, financial development and population do not have significant relationship with GDP.

H<sub>1</sub> = Exchange rates, foreign direct investment, financial development and population have significant relationship with GDP.

From regression model, it can be expressed as :

$$Y_{it} = \alpha + \beta X_{it} + \dots + \mu_{it}$$

Y = dependent variable

X = independent variable

$\alpha$  and  $\beta$  = coefficients

i and t = subject and time

$\mu_{it}$  = error

Therefore,

$$Y_{it} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \mu_{it}$$

$$GDP_{it} = \beta_0 + \beta_1 \text{ exchange rates} + \beta_2 \text{ foreign direct investment} + \beta_3 \text{ financial development} + \beta_4 \text{ population} + \mu_{it}$$

$$H_0 = \beta_1: \beta_2: \beta_3: \beta_4 = 0$$

$$H_1 = \beta_1: \beta_2: \beta_3: \beta_4 \neq 0$$

### 3.7 Method of analysis

The data described in Section 3.2 are to be examined and analysed using Panel Ordinary least Square (POLS) procedure. Before that, we also imposed the descriptive analysis and correlation analysis before end with Granger Causality test.

#### 3.7.1 Descriptive Analysis

Descriptive analysis is used to produce a situation analysis which normally consists of national or sub-national level information. This analysis quantitatively describes the basic features of the data study.

#### 3.7.2 Correlation Analysis

Correlation analysis is an analysis to examine the relationship among variables in the study. The correlation coefficient is measure of linear association between two variables. Values associated is always between -1 to +1.

### **3.7.3 Pooled Ordinary Least Squares (POLS) Regression Model**

This method of analysis is a method to estimate the unknown parameters in a linear regression model. The main goal is to minimize the differences between the observed responses in some arbitrary dataset and the responses predicted by the linear approximation of the data. There are several advantages for our least squares method are:

1. The best-fitting regression line is easily can be found
2. Only one best-fitting line can be confirmed.
3. The OLS estimator is consistent when the regressors are exogenous and there is no perfect multi-collinearity, and optimal in the class of linear unbiased estimators when the errors are homoscedastic and
4. OLS provides minimum-variance mean-unbiased estimation when the errors have finite variances.
5. Under the additional assumption that the errors be normally distributed, OLS is the maximum likelihood estimator.

### **3.7.4 Granger Causality test.**

The test is conducted to investigate how the variables Granger caused to other variables.

## **3.8 Conclusion**

In order to ensure we get the results, the econometrics procedures of this research were explained systematically in this chapter. The results and analysis would be discussed in chapter four.

## CHAPTER FOUR

### DISCUSSION OF RESULTS

#### 4.1 Introduction

Under this chapter we will discuss on the results and the analysis of the study. We start with descriptive analysis followed by the analysis of correlation. Next, we discuss on Panel Ordinary Least Squares (POLS) and Granger causality analysis.

#### 4.2 Descriptive analysis

Table 4.1  
*Descriptive Analysis Results*

|              | GDP      | EXC_RATE | FDI       | FINDEV   | POPULATION |
|--------------|----------|----------|-----------|----------|------------|
| Mean         | 26.55905 | 4.009143 | 18.06962  | 4.540695 | 18.14510   |
| Median       | 26.16487 | 3.748237 | 21.89122  | 3.719598 | 18.15406   |
| Maximum      | 29.88132 | 9.949102 | 24.89447  | 10.10635 | 21.02882   |
| Minimum      | 23.75515 | 0.222884 | 1.823865  | 0.148555 | 15.07525   |
| Std. Dev.    | 1.498146 | 2.719688 | 7.981306  | 2.870535 | 1.462619   |
| Skewness     | 0.559645 | 0.726976 | -1.301004 | 0.279027 | -0.028101  |
| Kurtosis     | 2.344137 | 2.753857 | 2.814255  | 1.817135 | 3.313683   |
|              |          |          |           |          |            |
| Jarque-Bera  | 11.99112 | 15.49375 | 48.48527  | 12.18798 | 0.723586   |
| Probability  | 0.002490 | 0.000432 | 0.000000  | 0.002256 | 0.696427   |
|              |          |          |           |          |            |
| Sum          | 4541.597 | 685.5634 | 3089.905  | 776.4588 | 3102.813   |
| Sum Sq. Dev. | 381.5551 | 1257.439 | 10829.21  | 1400.795 | 363.6730   |
|              |          |          |           |          |            |
| Observations | 171      | 171      | 171       | 171      | 171        |

As shown in table 4.1, the descriptive analysis states that variables have 171 observations. GDP has mean value of 26.56 while the maximum is 29.88 and minimum 23.76. The standard deviation of GDP is 1.50. Mean value for exchange rate is 4.01 and standard deviation at 2.72. Mean for FDI is 18.07 where the standard

deviation is 7.98. The mean for FINDEV and POPULATION are 4.54 and 18.15, and the standard deviations are at 2.87 and 1.46 respectively. Hence, we know that FDI has the highest standard deviation and largest variation between the minimum and maximum compared to other variables, where the maximum and minimum value at 24.89 and 1.82 respectively. This implies that from the mean of FDI, the dispersion is more spread for FDI than the other variables.

### 4.3 Correlation analysis

Table 4.2  
Correlation Matrix Results

| Correlation |                       | EXC_RATE              | FDI                   | FINDEV                | POPULATION |
|-------------|-----------------------|-----------------------|-----------------------|-----------------------|------------|
| Probability | GDP                   |                       |                       |                       |            |
| GDP         | 1.000000              |                       |                       |                       |            |
| EXC_RATE    | -0.100964<br>0.1889   | 1.000000              |                       |                       |            |
| FDI         | 0.766622***<br>0.0000 | 0.114969<br>0.1343    | 1.000000              |                       |            |
| FINDEV      | 0.013766<br>0.8582    | 0.867987***<br>0.0000 | 0.105248<br>0.1707    | 1.000000              |            |
| POPULATION  | 0.512647***<br>0.0000 | 0.194331**<br>0.0109  | 0.676662***<br>0.0000 | 0.334009***<br>0.0000 | 1.000000   |

**Notes:** \*, \*\*, \*\*\* significant at 0.10, 0.05, and 0.01 levels, respectively



Table 4.2 represents the correlation coefficient in which analyses the relationships between two variables of the variables. There are only two significant correlations between the dependent and independent variables. It can be seen that FDI correlates negatively and significantly affecting the growth (GDP) corr : - 0.766622, p- value : 0.0000). In contrast, there is a positively significant correlation between growth (GDP) and population (corr: 0.512647, p- value: 0.0000).

For the relationship between each independent variable, exchange rate (EXC\_RATE) is positively correlated and significant with financial development (FINDEV) (corr : 0.867987, p-value : 0.0000). In this case, though multicollinearity exist, but it does not adversely affect the regression equation as in this study only to predict the dependent variable from one set of predictor variables. As overall, R-squared will give a sign of how well the independent variables in the model to predict the dependant variable. Population also positively correlated significant with exchange rate (corr : 0.194331, p-value : 0.0109). Besides that, FDI and population is said to have negative correlation and significant at 1% (corr : -0.676662 , p-value : 0.0000), whereas financial development is positively correlated and significant (corr : 0.334009, p-value : 0.0000)

#### 4.4 Panel Ordinary Least Squares (POLS)

Table 4.3  
*Panel Least Squares Results*

| Variable           | Coefficient | Std. Error            | t-Statistic | Prob.     |
|--------------------|-------------|-----------------------|-------------|-----------|
| C                  | 33.28768    | 1.570418              | 21.19670    | 0.0000*** |
| EXC_RATE           | -0.249337   | 0.052853              | -4.717578   | 0.0000*** |
| FDI                | -0.172631   | 0.013532              | -12.75761   | 0.0000*** |
| FINDEV             | 0.300003    | 0.055746              | 5.381652    | 0.0000*** |
| POP                | -0.218893   | 0.079490              | -2.753719   | 0.0065*** |
| R-squared          | 0.649110    | Mean dependent var    |             | 26.55905  |
| Adjusted R-squared | 0.640655    | S.D. dependent var    |             | 1.498146  |
| S.E. of regression | 0.898070    | Akaike info criterion |             | 2.651667  |
| Sum squared resid  | 133.8840    | Schwarz criterion     |             | 2.743528  |
| Log likelihood     | -221.7175   | Hannan-Quinn criter.  |             | 2.688940  |
| F-statistic        | 76.77058    | Durbin-Watson stat    |             | 0.301883  |
| Prob(F-statistic)  | 0.000000    |                       |             |           |

**Notes:** \*, \*\*, \*\*\* significant at 0.10, 0.05, and 0.01 levels, respectively  
From the equation,

$$Y_{it} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \mu_{it}$$

$$R_{it} = \beta_0 + \beta_1 \text{EXC\_RATE} + \beta_2 \text{FDI} + \beta_3 \text{FINDEV} + \beta_4 \text{POP} + \mu_{it}$$

$$R = 33.29 - 0.25 \text{EXC\_RATE} - 0.17 \text{FDI} + 0.3 \text{FINDEV} - 0.22 \text{POP} + \mu_{it}$$

$$\text{Se} = (1.570418) (0.052853) (0.013532) (0.055746) (0.079490)$$

$$t\text{-stat} = (21.19670) (-4.717578) (-12.75761) (-5.381652) (-2.753719)$$

$$\text{Prob.} (0.0000) (0.0000) (0.0000) (0.0000) (0.0065)$$

$$n = 171$$

$$R^2 = 0.649110$$

$$\text{Adj } R^2 = 0.640655$$

From the above, the T- statistical is conducted to measure how extreme a statistical can be estimated. The value can be computed by subtracting the hypothesized value from the statically estimate and then divide by the standard error. Furthermore, we also need to find the degree of freedom form the observation the formula of degree of freedom is:

$$N-K-1$$

Where N is the number of observation and K is the number of independent variable. In this study, the degree of freedom is  $171 - 4 - 1 = 166$ . As a result, due to the value of t-statistics for both variables is more than 1.96 critical value based on 1% confidence level for 2 tails, exchange rate, foreign direct investment, financial development and population have a significant relationship with growth (GDP).

#### **4.4.1 Relationship between Financial Development and Growth**

The result shown in the Ordinary Least Square model reflects that financial development has a positive relationship with the growth of 9 selected countries. This indicate that 1 % increase in Financial development causes 30% increase in growth of the selected countries with the economic assumption of the other variables are remain constant. Based on the significance level 1%, the null hypothesis that stated financial development has an insignificance relationship is rejected. As the result, financial development has a significance relationship with the growth rate for the selected 9 countries. (Alkhuzaim,2014; King and Levine, 1993a, Calderon and Liu,2003 ;Hsueh et al.,2013)

#### **4.4.2 Relationship between Exchange Rate and Growth**

The result shown in the Ordinary Least Square model reflects that exchange rate has a negative relationship with the growth of 9 selected countries. This indicate that 1 % increase in exchange rate will causes 25% decrease in growth of the selected countries with the economic assumption of the other variables are remain constant. Based on the significance level 1%, the null hypothesis that stated exchange rate has an insignificance relationship is rejected. As the result, exchange rate has a significance relationship with the growth for the selected 9 countries. This result similar to research had done by Federici and Caprioli (2008).

#### **4.4.3 Relationship between Population and Growth**

The result shown in the Ordinary Least Square model reflects that population has a negative relationship with the growth of 9 selected countries. This indicate that 1 % increase in population causes 22% decrease in growth of the selected countries with the economic assumption of the other variables are remain constant. Based on the significance level 1%, the null hypothesis that stated financial development has an insignificance relationship is rejected. As the result, financial development has a significance negative relationship with the growth rate for the selected 9 countries.

#### **4.4.4 Relationship between FDI and Growth**

The result shown in the Ordinary Least Square model reflects that FDI has a negative relationship with the growth of 9 selected countries. This indicate that 1 % increase in FDI will causes 17% decrease in growth of the selected countries with the economic assumption of the other variables are remain constant. Furthermore, based on the significance level 1%, the null hypothesis that stated FDI has an insignificance relationship is rejected. As the result, FDI has a significance relationship with the growth rate for the selected 9 countries. The foreign direct investment predictably

reduces the domestic investment and employment however foreign direct investment also allows firms to enter new market and to excess foreign technology. ( Hazer, 2010; Khaliq and Noy, 2007;Asghar, Nasreen and Rehman, 2011)

#### **4.5 Granger Causality**

The next step of this analysis is to examine the causal relationship among variables by looking at the direction. Therefore, we used a pairwise Granger causality test to estimate the causal relationship among the variables. The test result of the Granger causality is presented in Table 4.4.



Table 4.4  
*Pairwise Granger Causality Test*

| Null Hypothesis:                       | Obs | F-Statistic | Prob.     |
|--|-----|-------------|-----------|
| FDI does not Granger Cause EXC_RATE    | 153 | 0.80740     | 0.4480    |
| EXC_RATE does not Granger Cause FDI    |     | 0.03952     | 0.9613    |
| FINDEV does not Granger Cause EXC_RATE | 153 | 0.01525     | 0.9849    |
| EXC_RATE does not Granger Cause FINDEV |     | 2.74426     | 0.0676*   |
| GDP does not Granger Cause EXC_RATE    | 153 | 1.20650     | 0.3022    |
| EXC_RATE does not Granger Cause GDP    |     | 0.72854     | 0.4843    |
| POP does not Granger Cause EXC_RATE    | 153 | 2.18828     | 0.1157    |
| EXC_RATE does not Granger Cause POP    |     | 0.60469     | 0.5476    |
| FINDEV does not Granger Cause FDI      | 153 | 0.06063     | 0.9412    |
| FDI does not Granger Cause FINDEV      |     | 0.94730     | 0.3901    |
| GDP does not Granger Cause FDI         | 153 | 0.24020     | 0.7868    |
| FDI does not Granger Cause GDP         |     | 0.88878     | 0.4133    |
| POP does not Granger Cause FDI         | 153 | 0.41824     | 0.6590    |
| FDI does not Granger Cause POP         |     | 2.59949     | 0.0777*   |
| GDP does not Granger Cause FINDEV      | 153 | 2.11460     | 0.1243    |
| FINDEV does not Granger Cause GDP      |     | 1.75773     | 0.1760    |
| POP does not Granger Cause FINDEV      | 153 | 2.24326     | 0.1097    |
| FINDEV does not Granger Cause POP      |     | 1.02134     | 0.3626    |
| POP does not Granger Cause GDP         | 153 | 2.33491     | 0.1004    |
| GDP does not Granger Cause POP         |     | 5.05485     | 0.0075*** |

**Notes:** \*, \*\*, \*\*\* significant at 0.10, 0.05, and 0.01 levels, respectively

As presented in Table 4.4 the results of pairwise Granger causality between GDP, EXC\_RATE, FDI, FINDEV and POP reveal that a unidirectional causal relationship exists between population and foreign direct investment at 1%, the causal relationship runs from FDI to POP. In the same vein, a unidirectional causal relationship can be found to exist between exchange rate and financial development rate running from EXC\_RATE to FINDEV at also 1%. There is also unidirectional causal relationship can be found exist in POP and GDP at 10% level.



## CHAPTER FIVE

### CONCLUSION

#### 5.1 Summary and discussion

We empirically investigated that exchange rate, foreign direct investment, financial development and population are function to economic growth in case of ASEAN plus three main of Southeast countries (China, Japan and Korea). We applied Panel Ordinary Least Squares (POLS) testing approach to investigate on the correlations and if the independent variables had been chosen are significantly correlated to the growth. In order to estimate how the causative direction among variables, we also applied Granger Causality test.

Our analysis confirmed that all the independent variables, financial development, exchange rates, population and foreign direct investment chosen in this analysis has significant relationship towards the growth of economy. This implies that all the independent variables move in the same direction as the results propose that spur the economic growth. Hence, from the findings we may answer the objective stated in the previous chapter while conducting the study. As the null hypothesis can be rejected at 1% level, we confirmed that financial developments and economic growth are correlated to each other. There is also positive correlation has the financial development employed to economic growth. However, there is negative relationship correlation have the exchange rate, foreign direct investment and population employed to the economic growth.



## 5.2 Recommendation

Hence, refer to the research findings we can suggest that government plays a major role to hasten the growth of economics. A good macroeconomic environment and develop infrastructure must be created to increase production by encouraging investment, and indirectly generate competition and productivity in the economy. Moreover, in order to enhance the process of capitalization to promote economic growth, financial sectors played an important role to initiate new policy. This can be done by allocating resources to capable and profitable projects. Demand for financial services will continue to increase with economic growth in turn encourages the development of financial sector. Besides that, in order to promote economic growth, attention should be focused on long-run policies of financial development which requires well-developed financial systems, especially with sound financial indicators like interest rate that helps to maintain sustainable economic growth. By increasing the number of financial institutions to enhance the supply of credit to private sectors is one recommendation to influence economic growth. Consequently, the government should strengthen the reforms in the financial sectors which can attract investors and improve the efficiency of all production activities in the country. All these are lead the economic growth in the long-run. In the end, there is no denying the fact that economic growth does not only depend upon the stock market and/or the banking sector. The government securities markets, derivatives market, private debt markets, venture capital and new issue markets, along with legal and institutional factors are also vital for invigorating economic development. Finally, it is recommended that the government to enhance macro-economic policies especially the fiscal policies, policies that attract foreign direct investment and export promotions policies that will

generate growth. With economic growth, demand for financial services will increase, leading to the development of financial sectors



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