EFFECT OF MACROECONOMIC FACTORS, FINANCIAL DEVELOPMENT AND STOCK MARKET DEVELOPMENT TOWARD ECONOMIC GROWTH: EVIDENCE IN JAPAN

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DECLARATION

We hereby declare that:

(1) This undergraduate research project is the end result of our own work and that due to acknowledgement has been given in the references to ALL sources of information be they printed, electronically, or personal.

(2) No portion of this research project has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.

(3) Equal contribution has been made by each group member in completing the research project.

(4) The word count of this research report is 26,140 words.

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From the initiation to the completion of this study paper, it was only possible and achievable with the upright synergy of aptitude and attitude displayed by those who are involved.

The result of the work is not without all the unhesitant cooperation, synchronistic harmonies, and the collective determinations from every individual involved. Of which includes all 5 members of the team, and the team's supervisor – Ms. Kuah Yoke Chin in exhibiting utmost proficiencies.

Expressing cordial gratitude to Ms. Kuah Yoke Chin may only seem to be an understatement, for she has given us astute guidance and directive supervision in the progress of conducting this study paper. With the time and dedication she has conferred onto us, extensive care and virtue of result honesty were able to manifest themselves amid the supervision.

This final year project has given all the members chances to fully utilize and expand their repertoire, thus allowing everyone to extrapolate all fundamentals attained throughout the courses of our studies in UTAR, of which is also a tertiary educative University that deserves everyone's appreciation.

The overall experience was quite sublime. Being able to cultivate most of every value there is about in coming up with a satiating study paper by an undergrad's standards has allowed every member to enjoy and understand the importance of this project.

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Note: Where $TOPIXQuate_t$ is TOPIX stock quote

$TOPIXCAP_t$ is market capitalization

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LIST OF ABBREVIATIONS

AIC	Akaike Information Criterion
ADF	Augmented Dickey-Fuller
APT	Arbitrage Pricing Theory
BNM	Bank Negara Malaysia
CAPM	Capital Asset Pricing Model
CPI	Consumer Price Index
DCR	Domestic Credit Ratio
E-Views	Econometric Views
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GFCF	Gross Fixed Capital Formation
HPAE	High Performing Asian Economies
INV	Investment Ratio
IR	Interest Rate
JB-Statistic	Jarque-Bera Statistic
LM	Lagrange Multiplier
OECD	Organization for Economic Co-operation and Development
OLS	Ordinary Least Square
PP	Phillips-Perron
PPP	Purchasing Power Parity
SIC	Schwarz Information Criterion
SMC	Stock Market Capitalization
VAR	Vector Autoregression
VECM	Vector Error Correction Model
VIF	Variance Inflation Factor

PREFACE

This research project is submitted in partial fulfillment to the requirement for Bachelor of Finance (Hons). Ms. Kuah Yoke Chin is our supervisor for this research project. This final year project was carried out solely by the authors but it is based on previous researches, and the sources are quoted in reference.

Numerous findings of the researches and studies have been concluded in this study paper, but are very none of them did research on the combination of three indicators: Financial Development, Stock Market Capitalization, and Macroeconomic Factors. This combination of variables' effect on Japan's economic growth was examined. It is intriguing to understand more of the in-depth details on the model of the variables in Financial Development, Stock Market Capitalization, and Macroeconomic Factors that will influence the economic growth. For this reason, "Effect of Macroeconomic Factors, Financial Development, and Stock Market Capitalization towards Economic Growth: Evidence in Japan" was chosen as our topic.

The completion of this study paper is difficult, but an abundant of knowledge pertaining to the economic growth in Japan is attained and comprehended. The apprehended notions and understandings pose a great deal in enriching our repertoire, of which are very helpful for our future careers.

ABSTRACT

Economic Growth has a decisive function in expressing the Gross Domestic Product of a country. It influences various other macroeconomic factors, with employment rate being one of the most prominent ones. Countries with healthy, stable and steady economic growth always enjoy favorable conditions in either long or short run. Powerfulness and the leadership of a country depends several factors, but Economic Growth often plays a very crucial role in determining this.

This study investigates the effects of independent variables like macroeconomic factors, financial developments and stock market developments have on Japan's economic growth from 1998 to 2012 in a quarterly interval. This paper will base on the results from E-Views 7 to discuss the impacts of independent variables including inflation, interest rate, foreign direct investment, stock market capitalization, domestic credit ratio and investment ratio toward Japan's economy in term of the importance, significances and relationship.

Contributions provided by this paper will allow policy makers such as Japan's central bank and stakeholders of a country to understand which independent variables that can influence the economic growth of Japan.

CHAPTER 1: RESEARCH OVERVIEW

1.0 Introduction

Firstly, this chapter focused on the discussion of this paper's research background. The backgrounds of Japan include history, geographic, demographic, economy and culture of Japan are discussed. Alongside of the introduction on the background of Japan, this paper brought in the discussion of the definition of economic growth, importance of economic growth and economic growth in Japan. Next, a few problems that this paper bring into the discussion are also included in this chapter. The research objective is the section that the goals of this research are determined.

Besides, this chapter also listed out all questions regarding to this research as well as the hypothesis of this paper. The importance and contributions of this paper are listed in the part that followed after. Another subtopic of chapter one included a brief layout of each chapter in this paper. Before the end of this chapter, a conclusion is provided upon a summary that linked to next chapter that discuss on the literature review from previous study.

1.1 Research Background

1.1.1 Japan's background

Japan is one of the top ten island country in the world. After Indonesia, Madagascar, Papua New Guinea, Japan was rank as the fourth largest island country in the world ("Top ten largest island countries in the world", n.d.). According to Briney (n.d.), Japan is formed with a combination of four major islands, which are Honshu, Hokkaido, Shikoku as well as Kyushu and approximately another 6,500 minor islands in Pacific Ocean. The Japanese called their nation "Nippon" or sometimes "Nihon". These unique names simply mean "source of the sun" and often called as "the land of the rising sun", because Japan is located in the East Asia (Askpari, 2012; "Why Japan is known as the land of rising sun", n.d.). Moreover, Japanese flag is officially called as Nisshoki, but the flag is commonly referred to as "Hinomaru", a literal meaning for "sun disc", sporting a bright red disc at the epicenter as an epitome of "the circle of the sun" ("Japan flag", 2012).

Almost 400 years ago, Tokyo was formerly named as Edo, while Kyoto city was the capital of Japan during that time (Cybriwsky, 1993). Based on "Overview of Tokyo" (n.d.), the population in Edo was exceeded a million, which was larger than Kyoto and it has become the biggest city in Japan. This also resulted in the Emperor moved from Kyoto to Edo, established government office and renamed the city as Tokyo in 1868 ("Overview of Tokyo", n.d.; "Edo period", n.d.). Since 1868, Tokyo has officially become the capital of Japan. In 1935, there was increase steeply in populace of the major city Tokyo, it increased to 6.36 millions, which was equivalent to the population of the New York City and London ("Overview of Tokyo", n.d.).

Unfortunately, until October 1945, the population of Tokyo fell significantly to 3.49 million, because much of the area in Tokyo had reduced to rubbles by the bombardments in World War II ("Overview of Tokyo", n.d.). On the other hand, the population of Tokyo keeps on increase year after year after the dramatic drop in 1945, and currently Tokyo city is the largest population around the world with approximately 13.29 million people in 2011 ("The world's 15 biggest metropolitan areas", 2011). With using the metro population to identified the size of the city, Japan still is the largest city in 2012 (Largest Cities of the World, n.d.)

By referring to "Overview of Tokyo" (n.d.), the first telecommunication line of Japan was opened between Tokyo and Yokohama in 1869. Besides, Japan started running their first steam locomotive in 1872, which travel along way from Shimbashi to Yokohama. Also, Japan started their primary subway line that linked Asakusa and Ueno together in 1927. With the advancement in the telecommunications and transportations, Japan was able to trade their goods and services efficiently, these are the reason of Japan's economy was boost up during that time.

In term of Japanese' belief, there are two highly prominent religions in Japan, which are Shintoism and Buddhism ("Religion in Japan", n.d.). As in accordance to Ohta (2006), Shintoism is also known as "the methods of the Gods". It is the original reliance of the Japanese and it is the epithet of Japan herself. There are two features in Shintoism, first, there is no right or wrong, and nobody is flawless and perfect. Another feature in Shintoism is that it does not consider life after death like Buddhism and there are no sutras, like the Holy Bible at all. Another religion that practice in Japan is Buddhism that was introduced by China in the 6th century and was soon accepted as their state religion. Originally, Chinese Buddhism was already mixed and fused

with Confucianism and Taoism ("Confucianism, Taoism and Buddhism", n.d.). Besides, it is widely known that the Japanese embraces certain aspects of Confucianism and Taoism. According to Ohta (2006) the worship of Shinto is housed and referred to a Shrine, while Buddhists' place of worship is a temple. In addition, many Japanese practiced Shinto for celebrating birth and marriage while following Buddhist ceremonies for funerals and memorial services.

In term of geographic, Shinano River is the longest river in Japan and there is an expanse of fertile land called Niigata Plains around the Shinano River ("Niigata", n.d.). Therefore, the fertile land facilitated a wide variety of plantations and achieved a great success in rice farming ("Niigata", n.d.).

In term of culture, Japan serves as the originator for difference forms of self-defense martial arts, namely the widely known "sumo", "judo", "karate" and "kendo" (Paul, 1995). Aside from these, Japanese's sophistication and refinement in cuisine are sushi and sashimi. Another culture is Japanese geisha which is also known as a female entertainer, but the Geisha traditions of Japan are obsolete in this today's world (Szczepanski, n.d.).

Last but not least, it is proud to say that Japan was the first Asian country to attain the economic growth in an amazingly fast rate, particularly throughout 1960s, when the average growth rate of Japan was approximately 10% per annum (Chang & Huang, 2010). Currently, Japanese economy is the third most prevalent economy on earth, as United States of America and mainland China having higher Gross Domestic Products than Japan (Barboza, 2010).

1.1.2 Definition of Economic Growth

Economic growth can be illustrated as an upbeat change on the output of a nation's manufacturing goods and services, stretching over a certain period of time (Kanu & Ozurumba, 2013). Besides, Antwi, Mills, and Zhao (2013) defined economic growth in the simplest form, which is an increase in real Gross Domestic Product (GDP). Economic growth can expand people's choices and making human life better, because it enriches the society (Durning, 1992). Furthermore, Kanu and Ozurumba (2013) stated that economic growth can directly measure a nation's output and provides an idea of how well the economy of a country is, thus the country's leader able to compare their performance with other countries.

1.1.3 Importance of Economic Growth

Growth is not everything, but without growth there will be nothing at all (Thomas, 2003). Economic growth is vital because it will lead to higher quality of life, which the country can develop a better quality of our standard of living (Palmer, 2012). Moreover, Dollar and Kraay (2002) emphasized that growth on average does benefit the underprivileged as much as anyone else in a civilization, so economic growth is a poverty lessening strategy used by policy makers. The study of Verger (2009) also stated that if a nation has a well and stable economic growth then the poverty rate in that nation will be reduced. The reduction or removal of poverty is necessary, as it will create a greater equality in society and providing a royal life as well as more wealth for all citizens (Agrawal, 2007). In addition, there will be more skilled and

educated workforce, as the decrease of poverty also helps in the advancement of education (Agrawal, 2007). As a result, a country is able to reduce the poverty rate and increase their standard of living, provided when the country can achieve or obtain a consistence economic growth.

1.1.4 Economic Growth in Japan

Japan was the first Asian country to achieve the economic miracle of rapid growth, especially from the mid of 1950s until 1973, as the average annual growth rate is over 10% (Ito, 1996). At that time, the Japanese's automotives, electronic goods, and machines have already started to dominate the market with innovative and progressive technologies (Berrios, 2001). In the second half of nineteenth century, the Japan's structural modification from the debut of Japan to international trade, due to Japan's productivity growth outstripped of all other major developed economy (Saxonhouse, 1993). Japan implemented a robust orientation that focuses on exporting activities in the manufacturing facility to obtain the advantages of quality and pricings of their products. Therefore, this model has assisted in the transformation of Japan into the world's second largest economy in 1980s ("Japan looks for economic growth in emerging Asia", 2010).

In addition the growth rate of Japan from 1961 to 1989 was remarkable at the annual growth rate of around 6.37% (Fan, Hanazaki, & Teranishi, 2013). Based on the same source, the growth rate has dropped to an average of 1.67% from 1989 onward. In addition, the Japan's growth rate started to drop again in 1998, which obtained an average growth rate of 0.2% from 1998 to 2002 (Li, n.d.). In addition, throughout the year 1981 to 2013, Japan experienced

the highest Gross Domestic Product (GDP) growth in first quarter of 1988 which was 9.40 % and the lowest was in first quarter of 2009 with a negative 9.40%, so the average annual GDP growth rate was around 2.08% during the 33 years ("Japan GDP annual growth rate", n.d.). Futhermore, in a report that written by Tabuchi (2013), the reporter mentioned that Japan has a strong economy growth in first quarter of 2013, however the growth rate decline from an annualize rate of 3.8% in second quarter to 1.9% in third quarter of 2013. This was mainly caused by the weakening of consumer spending and exports (Tabuchi, 2013).

In addition, capital of Japan, Tokyo, took large step in economic growth, because of its increasing international economic activities and the surfacing of the information age in 1980s ("Overview of Tokyo", n.d.). With prominent attractions from radical technology, information, fashion, unique culture, and a worthy mentioning of favorable public safety, Tokyo have became one of the most active major cities in the world during 1980s ("Overview of Japan", n.d.).

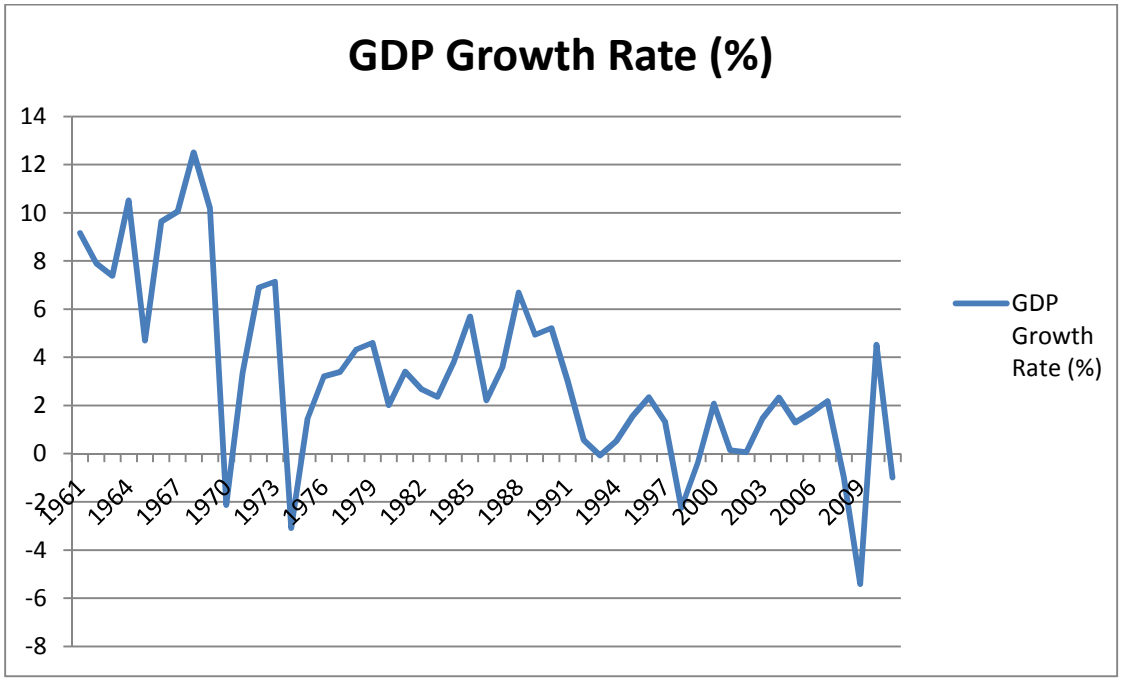
However, most of the industries especially service industries, medium-size manufacturing, and construction companies in Japan experienced shortage of workers in the late 1980, because Japan's booming economy that required a large number of workers. Additionally, the percentage for the scarcity of workers amplified from 46% in year 1989 to 58% in year 1990. This problem is due to the antipathy of manual labor and unskilled work among younger generation (Asakura & Murata, 2006). Therefore, Japan's government responded to this issue by amending the immigration control and refugee recognition act in 1989. In 2009, the shortage of worker problem in Japan was minimize, but the unemployment rate in Japan was 5.6% (Steinberg & Nakane, 2011).

In year 1980 until 1983, Japan experienced the nastiest and the longest postwar downturn (Gordon, 2008; Williams, 2010). In order to overcome the recession and boost up Japan's economy again, Japan's central bank decided to relax the monetary policy (Sato, 2001). Based on Sato (2001) study, the researcher showed that the central bank of Japan lowered down the discount rate to 2.5% in February 1987, which is the lowest discount rate in Japan. This stimulated the growth in domestic demand and influenced to the price bubble. In order to reduce the price bubble occurred in Japan, Bank of Japan use the contractionary monetary policy to reduce the money supply in the market by increase the interest rate to 6% in 1989 to 1990. However, it failed to overcome Japan's economy recession. As a result, Japan used expansionary policy again in 1991 to 2000, which decrease to 4.5% in 1991, 3.25%, 1.75% and 0.5% in 1992, 1993-1994 and 1995-2000 respectively (Powell, 2002). Due to the ineffectiveness of monetary policy, so both policies unable boost up the economy of Japan and overcome the recession problem. Currently, Japan maintains a low discount rate after 2000 and at an average of 0.3% from year 2011 to the end of 2013 ("Bank of Japan basic discount rate", n.d.).

Before Japan experienced economy downturn, Japan has designated as one of the member of Group of Seven (G-7) in 1975, because Japan was economically well-built (Berriors, 2001). Based on the "Group of seven-G-7 definition", (n.d.), G-7 is a forum for the world's seven most industrialized economies and the country include France, Germany, Japan, United States, United Kingdom and Canada. However, Japan experienced the lowest growth among the G-7 from 1991 to 2008, as Japan's annual growth rates revolves around 1% only (Chang & Huang, 2010). As Japan's economy growth was slow down, so China has outperformed Japan and became the world's second main economy in 2010, with an achievement of almost $9 trillion of output (Jefferson, Hu, & Su, 2006).

1.2 Problem Statement

Figure 1.1: Gross Domestic Product (GDP) Growth Rate (%)



Source: "Japan GDP growth rate", Datastream (2013)

According to the percentage change in Gross Domestic Product (GDP) that is shown in Figure 1.1, this paper has identified that the Japan's GDP growth rate projected a declining trend starting from year of 1980 to 2013. The GDP growth in Japan is started to drop in 2008 with the percentage of -0.9899 and reaching its minimum point in the year of 2009 with a percentage of -5.4188 of growth rate. It is probably due to the global financial crisis that happened when US investors' confidence are lost upon the value of subprime mortgages caused a crisis related to liquidity. Japan was vulnerable during this stage because of the changes of trade and industrial structure over the past decade, thus Japan's output has become a lot more reactive to the shocks in the advanced markets' output that are in the United States of America and Western Europe.

The structural alterations consist of two major mechanisms. First, over 90% of Japan's export consists of high return elastic manufacturing supplies, capital goods, and long term consumer products. These are mainly intermediary products used in the manufacturing for the United States of America and Western Europe. Second, Japan's trade reliance has amplified since the beginning of the 2000s, thus it is more responsive to the negative demand shock impending from the external (Kawai & Takagi, 2009).

As observed from Figure 1.1, the GDP growth in Japan over the 50 years is highly volatile. However, it is obviously exposed that there is a declining trend in the GDP growth rate in Japan. Harden (2009) reported that the Japan's GDP continues its speedy decline following the global financial crisis. As mentioned by Harden (2009), Japan's rate of reduction is more than double that of the United States, where GDP diminished at an annualized rate of 6.1% in the first quarter of 2009.

Frank and Enkawa (2009) stated that the diminishment in GDP growth could affect the life contentment of Japanese. The effect was not entirely direct but interceded via consumer confidence and satisfaction, adaptive expectations, health, and job satisfaction. Impeded economic growth signified that the productivity of a nation's goods and services are low, this implied that the market size of the nation unable to obtain a quick growing rate and the purchasing power of the population in the nation is diminishing, and this may affect the quality of life among Japan's citizen.

The reason behind of carrying out this research is to examine to what extent the macroeconomic factor, financial market and stock market development indicator in affecting the economic growth in Japan. So far, there are very little researches that carry out research that cover three type of indicator at the one time, most of the research is examine the economic growth by using only one type of indicator. For

example, examine the economic growth by using either macroeconomic factor or financial market indicator or stock market development indicator. Thus, this paper is aimed to test these three types of indicators in one breath as it would like to know which of the factors or indicators is more significant to the economic growth in Japan.

Therefore, this paper mainly focused on three categories of variable, which are macroeconomic variable, stock market development variables and financial development variable. At the end of this research, this paper able to conclude what are the variables that is more significant in enhancing the economic growth in Japan so that the government as well as central bank of Japan can work control on this variable in order for the improvement of economic growth and also the quality of life of the Japan's citizen.

In conclusion, there are total of six variables taken into account in this research paper, they are made up of macroeconomic factor, financial market indicator and stock market development indicator. Among of these six variables, there are Inflation, Foreign Direct Investment, Interest Rate, Stock Market Capitalization, Domestic Credit Ratio, and Investment Ratio. Therefore, this paper has integrated the variables in this paper to investigate and determine if there is any relationship between these variables and economic growth in Japan. Yet, this paper intends to find out to what extent each categories of variable affect the economic growth in Japan.

1.3 Research Objectives

1.3.1 General Objective

This paper is mainly focused on the study of the relationship between the independent variables of macroeconomics, financial development as well as stock market development and economic growth in Japan from 1998 Quarter 1 - 2012 Quarter 4.

1.3.2 Specific Objectives

I. To find out whether there is a relationship between inflation and economic growth in Japan from 1998 Quarter 1 - 2012 Quarter 4.

II. To find out whether there is a relationship between foreign direct investment and economic growth in Japan from 1998 Quarter 1 - 2012 Quarter 4.

III. To find out whether there is a relationship between interest rate and economic growth in Japan from 1998 Quarter 1 - 2012 Quarter 4.

IV. To find out whether there is a relationship between stock market capitalization and economic growth in Japan from 1998 Quarter 1 - 2012 Quarter 4.

V. To find out whether there is a relationship between domestic credit ratio and economic growth in Japan from 1998 Quarter 1 - 2012 Quarter 4.

VI. To find out whether there is a relationship between investment ratio and economic growth in Japan from 1998 Quarter 1 - 2012 Quarter 4.

1.4 Research Questions

I. Whether the relationship between inflation and economic growth in Japan from 1998 Quarter 1 - 2012 Quarter 4 has a significance relationship?

II. Whether the relationship between foreign direct investment and economic growth in Japan from 1998 Quarter 1 - 2012 Quarter 4 has a significance relationship?

III. Whether the relationship between interest rate and economic growth in Japan from 1998 Quarter 1 - 2012 Quarter 4 has a significance relationship?

IV. Whether the relationship between stock market capitalization and economic growth in Japan from 1998 Quarter 1 - 2012 Quarter 4 has a significance relationship?

V. Whether the relationship between domestic credit ratio and economic growth in Japan from 1998 Quarter 1 - 2012 Quarter 4 has a significance relationship?

VI. Whether the relationship between investment ratio and economic growth in Japan from 1998 Quarter 1 - 2012 Quarter 4 has a significance relationship?

1.5 Hypotheses of the Study

1.5.1 Inflation (INF)

H_0: The relationship between inflation and economic growth in Japan does not exist.

H_1: The relationship between inflation and economic growth in Japan does exist.

Inflation is an increment in the overall level of prices of goods and services in an economy of the nation over a certain period of time, as stated by Burda and Wyplosz (2005). If inflation keeps on increasing, every dollar will demand lesser amount of products. In the other word, purchasing power of the nation will fall, if the rate of overall level of prices for goods and services are rising. (*"Definition of inflation", n.d.*).

1.5.2 Foreign Direct Investment (FDI)

H_0: The relationship between foreign direct investment and economic growth in Japan does not exist.

H_1: The relationship between foreign direct investment and economic growth in Japan does exist.

Foreign Direct Investment (FDI) is referring to foreign investors' investment directly into the manufacturing or industry in aboard country, rather than the company's host country. There are two types of FDI one of that is through buying a company in a targeted nation, while another one is expanding operations of an existing business in another country (Burda & Wyplosz, 2005). FDI vary considerably from indirect investments such as portfolio flows, in which overseas institutions investment in stocks that are listed on the country's stock exchange ("*Definition of foreign direct investment", n.d.*).

1.5.3 Interest Rate (IR)

H_0: The relationship between interest rate and economic growth in Japan does not exist.

H_1: The relationship between interest rate and economic growth in Japan does exist.

Interest rate can be defined as the amount charged by a lender to a borrower for the use of assets such as vehicles, properties or money, because lender want to protect themselves from the loss from the asset's use ("Definition of interest rate", n.d.). Normally, interest rate is a function to charge interest in lending and pay interest when holding customers deposit (Amadeo, 2012). Besides, Amadeo (2012) also mentioned that in order to enhance economic growth in a country, central bank should be responsible in setting the percentage of interest rate, as it affects the supply of money in the market.

1.5.4 Stock Market Capitalization (SMC)

H_0: The relationship between stock market capitalization and economic growth in Japan does not exist.

H_1: The relationship between stock market capitalization and economic growth in Japan does exist.

Stock Market Capitalization (SMC), otherwise known as market value, is the price of share multiplying the number of outstanding shares, as stated by Carp (2012). Listed companies are the nationally integrated corporations listed in the nation's stock exchanges. On the other hand, listed corporations do not involve investment banking, mutual funds, or other collective investment instruments ("Market capitalization of listed companies in percentage of GDP", n.d.).

This independent variable was intended to determine the development of stock markets with an assumption that the "size" of the market is positively correlated with existing liquidity (Marques, Fuinhas, & Marques, 2013). SMC attempts to calculate the easiness with which funds can be raised in the equity market and changes in stock market valuations may play a significant role as concerns expected returns on investment (Leahy et al. 2001).

1.5.5 Domestic Credit Ratio (DCR)

H_0: The relationship between domestic credit ratio and economic growth in Japan does not exist.

H_1: The relationship between domestic credit ratio and economic growth in Japan does exist.

Domestic Credit Ratio (DCR) is the ratio calculated from the total domestic credit over nominal GDP. It is used as a determinant of financial establishment and development in a nation (Marques et al. 2013). Domestic credit supplied by the banking sector comprises of all credit to various sectors on a gross basis, with the exclusion of credit to the central government ("Domestic credit provided by banking sector in percentage of GDP", n.d.).

1.5.6 Investment Ratio (INV)

H_0: There is no relationship between investment ratio and economic growth in Japan.

H_1: There is relationship between investment ratio per gross domestic product and economic growth in Japan.

Investment ratio is utilized as a base variable, or otherwise known as a control variable. It is very recurrent in the writings of the study in Bassanini, Scarpetta, and Hemming (2001) as well as the research of Leahy et al. (2001). Investment ratio is calculated from Gross Fixed Capital Formation (GFCF) (Marques, Fuinhas, & Marques, 2013).

1.6 Significance of the Study

This paper focused on the effects of several macroeconomic variables has on economic growth of Japan by using a wide-span of data of 15 years. The lack of variables' explanations are indemnified in further paragraphs, and pried in detail in the methodology section.

For many researchers have previously conducted their respective and tributes-worthy research on the subject matter of which how various relevant variables actually affect and ultimately set the pattern of an dependant variable, research pertaining to economics have also been carried out and published. But there is a notable lacking of a considerable amount of attention paid onto the case of Japan.

As a mixed study, it determined the type of purpose of this paper. This paper contributed to parties of interest that has the potential to intertwine their wellbeing with the pattern of Japan's economy. As mentioned by Dollar and Kraay (2002), economic growth is a poverty reducing strategy used by policy makers, so parties of interest such as policy makers and stakeholders can benefit from this paper shall the independent variables explain economic growth in a profound way. By the end of this paper, the readers and interest takers able see how the literature is on the brink of being an adequately useful knowledge to add to the audience. Evidence are constructed and provided with the backups, conformations, concordances, accords and confirmations from many findings of researchers listed in the references section. Such concordance proved the findings to be expected and very close to the truth.

And to allow understanding what affect a region's absorptive capacity may have on policy implications for how a poor, Foreign Direct Investment (FDI) scarce region can gain from concentrated FDI (Ouyang & Fu, 2012). The justification behind such passion displayed in attracting multinational enterprises has been discussed in the academic literature and in the community of policy makings (Barrios, Gorg, & Strobl, 2005). The effects of said independent variables have on the economic growth of Japan is worth the study because it allowed parties of interest to better understand the roles of each independent variable and their effects. So, that they may take influencing actions to better exploit them and turn things in their favor. To make things legal and mandatory, actions taken must be revised in such a way that is it legally permitted so that this paper will be utilized to any good.

In retrospect, several financial crises were indirectly internationalized by Japan because of their actions on elevating the interest on loan to Thailand. This overseas credit crunch reflects an international channel of crisis transmission (Brana & Lahet, 2009). And if not carefully nurtured, the overly powerful economy of Japan can be detrimental and backfires. So, this paper partially allowed such understanding and avoids repercussions.

Governments, citizens and non-citizens of Japan are significantly influenced by the economy, if not heavily influenced. With the background information stipulated, this is where the study is going on with detail as per the research question. The effects of said independent variables have on the economic growth of Japan is worth the study because it allows parties of interest to better understand the roles of each independent variable and their effects (Brana & Lahet, 2009). This paper could be of a good help to policy makers for Japanese banks to support their economy.

1.7 Chapter Layout

1.7.1 Chapter 1

An introduction of the topic of this paper that includes background of Japan and economic growth in Japan are discussed in this chapter. Researchers have also listed out the problem statement, of which this paper is going to carry out the research. The primary and sub objective of conducting this paper as well as the hypothesis of the investigation are included in this chapter. Other than that, it presents the contribution and significance of this paper.

1.7.2 Chapter 2

A number of previous studies are collected and summarized in this chapter. Besides, this paper listed the expected sign on the independent variable toward economic growth at here as well. In addition, those importance theoretical models are reviewed and discussed in this topic. This paper derived a conceptual framework of this paper.

1.7.3 Chapter 3

The preparation work is discussed at here, before carry out data analysis in the following chapter. The researchers descript the ways of this research used to collect all independent variables' data as well as the scale of measurement. In addition, all the methods that this paper planned to use for analyzing the data are listed as well.

1.7.4 Chapter 4

Chapter 4 revealed about the patterns of the results according to the estimation of data and methodology that were previously discussed in Chapter 3. Then, this paper analyzed as well as estimated findings in order to inquire the research question and hypotheses that were stated in the first chapter.

1.7.5 Chapter 5

The final part of this paper covered the summary of statistical analyses that were discussed in previous chapter. Discussions on major findings for all independent variables are included to make confirm on the research question and hypotheses. From the results obtained through the analysis, this paper provides the insights and implications of this paper for Japan's policy makers as well as practitioners. Other than that, it states the limitation of the study and provides suggestions for the future researchers for further study on this topic.

1.8 Conclusion

The sole purpose of this research paper is to study on the effects of Inflation Rate (INF), Foreign Direct Investment (FDI), Interest Rate (IR), Stock Market Capitalization (SMC), Domestic Credit Ratio (DCR) and Investment Ratio (INV) on the economic growth of Japan. The research objectives are set for identify the determinants of economic growth in Japan in order to benefit interest takers and policy makers involved. Results found in this research hold the potency of contributing to the possible improvement of economic growth in Japan. Interest takers like foreign and domestic investors can understand the factors and strength of economic growth in Japan. Policy makers such as the government can better comprehend the economy of Japan, allowing them to be better equipped in making new and or amendments to policies. This research paper also included the chapter layout of this paper to better serve as an index. After the elaboration of the research, literature is followed next. The revisions of many previous tribute-worthy researches pertaining factors that affect economy growth are done.

CHAPTER 2: LITERATURE REVIEW

2.0 Introduction

Previous researches papers that are pertaining to the determinants of economic growth are respectively reviewed here. Summarizing the crucial arguments, points and findings in the relevant researches served as a medium to bring out better comprehension of the readers. Better understanding on the radical natures of Economic Growth, Inflation (INF), Foreign Direct Investment (FDI), Interest Rate (IR), Stock Market Capitalization (SMC), Domestic Credit Ratio (DCR) and Investment Ratio (INV) are achieved.

Aside from that, this paper studied on the relationship and impact of all independent variables toward economic growth. By using the ideas laid down by previous studies' models, this paper can accurately utilize a distinctive framework to study the effect of INF, FDI, IR, SMC, DCR and INV on economic growth.

2.1 Review of the Literature

2.1.1 Economic growth (GDP)

Based on the research of Kanu and Ozurumba (2013), economic growth of a nation can be determined by the positive or negative change in the nation's output including both goods and services over a period of time. Also, Antwi, Mills, and Zhao (2013) stated that the growth and the performance on a country economic can be concluded from an increase or decrease in a country's real gross domestic product (GDP). According to the online sources ("Definition of economic growth", n.d.), the economic growth also can act as an indicator of the country's economy health; in order to gauge the country's living standard. It also explained that GDP usually does not take into account of underground economy. Positive economic growth raises the standard of living in the host country. At the same time, education, finance, image and health standards will be augmented. Factors that may affect the economic growth in this paper are listed in the next section where the literatures of independent variables are reviewed.

The benefit of economic growth in this paper is in accordance with the findings of Palmer (2012). In the research, Palmer found that economic growth is important because it lead to higher quality of life. The research of Dollar and Kraay (2002) emphasized that growth on average does benefit the poor as much as anyone else in the society, so policy maker can use economic growth as a strategy to reduce poverty rate in its countries. Verger (2009) also stated that the rushing of economic growth is capable of reducing the rate of

poverty in a country. This paper employed Japan's GDP per capita to represent the economic growth in Japan.

2.1.2 Inflation (INF)

Friedman's (1963) defined that inflation as an increase in the general price level in a steady and sustained manner. Similarly, Laidler, and Parkin (1975) also defined inflation as a process of continuously rising prices. In other words, there is a continuously depreciation of the currency. The researchers emphasized that virtue of inflation is the persistence or continuity of changes in prices.

The research of Fountas (2010) stated that inflation has negative relationship with economic growth and this result is in accordance with another previous research that carried out by Chong, Tan, and Baharumshah (2001). Rabiul (2010) also mentioned that inflation is significantly negative in explaining economic growth and this is supported by Barro, Kocherlakota, and Sims (1996). Bittencourt (2012) has also concluded that inflation is a main macroeconomic determinant of growth and has a negative impact on growth.

Andres and Hernando (1999) concluded in long term growth, inflation rates has negative low or moderate temporary impact whereby this effect is significant and generates a permanent reduction in the level of per capital income. The researchers also mentioned that inflation reduces the investment

level and the efficiency of productive factors. Thus, this variable is one of the important determinants to explain economic growth.

As in the earlier study by Bengoa and Sanchez-Robles (2003) concluded that inflation has negative impact on economic growth because once the inflation rate increase to extremely high level, it will harm on the export competitiveness between nations and the reduce on the demand from other nations. This might be an indication of the existence of lack of fiscal discipline, poor macroeconomic stability or distortions in the markets.

The research of Bruno and Easterly (1998) described that at business-cycle frequencies, inflation and growth may be positively related, and in medium and long-run, the relationship appeared to be negative. They proposed that there is inconsistent pattern of growth with lower rates of inflation, ambiguous growth affects with low to moderate rates of inflation and the relationship between growth and isolated high inflation crises in a temporal manner. Besides, they have concluded that their research firmly confirmed that inflation and growth are negatively associated.

However, Hussain and Malik (2011) argued that inflation is a significant variable in explaining economic growth and inflation-growth relationship is positive, in another word, inflation is causing a nation to growth.

Anwar and Nguyen (2011) have also argued that there is a mix relationship of positive and negative of inflation-growth. This finding is confirmed by Vinayagathasan (2013) that said inflation has non-linear relationship. He also

concluded that economic growth is hampered if inflation exceeds threshold level.

This paper is expecting its sign to be negative, which is concordantly in the findings of the researchers that are mentioned above. The inflation is intended to evaluate on price of products that consumers consume every day. This is a very important and significant variable in affecting the economic growth. In term of data, this paper employed the consumer price index as the measurement of inflation.

2.1.3 Foreign Direct Investment (FDI)

According to Barrios, Gorg, and Strobl (2005), Foreign Direct Investment (FDI) represents a capital inflow and modifies the host country capital endowment. FDI is also defining as the flows of direct investment from the investors abroad into the respective nation's economy. It includes three major categories of abroad investment, which including equity capital, reinvested earnings as well as intercompany transactions in capital between affiliated enterprises ("International Monetary Fund", 1995).

In the research of Barrios, Gorg, and Strobl (2005), they found that FDI always has a positive impact on intermediary industry services variety. The potential benefits for local's firms are highly depending on the relative strength of this positive externality. FDI can bring advantages for expansion of domestic firms and that positive externalities are possible to occur if there

is a massive quantity of capital transferred into a nation or it is more vigorous if the local firms are operating efficiently.

Extensive empirical studies of Ouyang and Fu (2012) using country-level and firm-level data has generally confirmed that FDI increases economic growth of recipient countries by bringing physical capital, advanced technology, and management expertise. Hence, it is expected that the sign of FDI to be positive toward a nation's gross domestic product.

Furthermore, a research was conducted to examine the effect on FDI toward 11 Latin American developing countries and Asian developing countries between 1970 and 1997 was mentioned that FDI has higher chances to encourage Asia's developing countries economic growth rather than in Latin America developing countries (Adams, 2009). In that research, it indicated that FDI has positive impact toward a nation's economic growth. The research of Bengoa and Sanchez-Robles (2003) also suggested that economic growth in the host countries are positively affected by FDI.

In the study of Barrios, Gorg, and Strobl (2005) found that FDI allows most of the local's intermediate product firms to expand their production lines in producing their supply of products, because the company able to involve in international export. In the research of Zhang (2001), the researcher found that a country able to attract more FDI by improve the education, sustain a stable macroeconomic condition and adopt liberalized trade policies, so it will improving the economic growth of a nation at the same time.

The increase of FDI in a nation is not only improving the level of output per capita but it can also speed up a country growth rate. Results from the previous study with using the panel data analysis in examined the determinant of countries' economic growth show that there is a positive effect on FDI toward economic growth. (Bengoa & Sanchez-Robles, 2003).

The research of Azman-Saini, Baharumshah, and Law (2010) found that the low absorptive capacity countries are unlikely to be effected by FDI. However, it also found that FDI has a stronger impact in most of the actively developing country economic growth and it is a positive effect. The impact of FDI on countries' growth is known to be stronger with export promotion policies than in countries that pursued import substitutions.

This paper expected that FDI has a positive sign. In concordance with findings of previous researcher, FDI is believed to be significant in its effect on economy growth in Japan since Japan has higher absorptive capacity and a higher level of development. So the FDI may have served as an upbeat to the economy growth of Japan. In term of data, this paper used FDI in percentage to find out whether FDI influence Japan's economic.

2.1.4 Interest Rate (IR)

According to "Definition of interest rate", (n.d.), Interest Rate (IR) is defined as the amount charged in percentage on the principal amount or an asset by a lender to a borrower as the compensation for the loss of the asset's use.

In accordance to Udoka and Roland (2012), his research laid down the statement that there is direct relationship between IR and gross domestic product (GDP) in Nigeria, meaning that increase in IR will encourage savers to save thereby inducing growth in the economy. Financial repression mostly occurs in countries that set lending nominal interest rate at low levels. This resulted in low IR, thus discouraging savings in the country and transfers the funds out of the financial system. The nation's investment will have been negatively affected and hence the economic growth.

The research of Nissim and Penman (2001) found that increases in IR are followed by higher profitability and growth. According to Chang and Huang (2010), the researchers found there is a significant positive effect on GDP.

This paper expected that IR to has a positive and significant relationship with the dependent variable, GDP in accordance to major researcher's finding. In order to fulfil the finding that relies on stock market development, this paper uses Japan's Treasury bill interest in percentage to investigate whether GDP is influenced by IR.

2.1.5 Stock Market Capitalization (SMC)

Stock Market Capitalization (SMC) is the ratio of the total value of listed shares in the market (Marques, Fuinhas, & Marques, 2013), it is often used as a measurement of stock market development (Levine & Zervos, 1996). SMC is used as the indicator for stock market development in research did by

Demirgüc-Kunt and Levine (1996). Besides, Levine and Zervos (1996) also use SMC to measure the contribution of the stock market to economic growth.

Cooray (2010) has found that the SMC is significance at the 5% level. As stated, a percentage increase in market capitalization will drive to 0.07% increase in per capita income. SMC is positive and significant to gross domestic product (GDP), suggesting that the SMC is crucial for determination of GDP which is aligned with the studies by Levine and Zervos (1996); Levine and Zervos (1998); Bencivenga, Smith, and Starr (1996); Atje and Javanovic (1993); Rousseau and Wachtel (2000); and Henry (2003) who found that stock markets promote economic growth. At the same time, Levine and Zervos (1996) also argued that increase in SMC, in return may improve an economy's ability to mobilise capital and diversify risk.

The result in Germany proved that the cointegrating vector shows a positive relationship between the level of GDP and SMC effect (Aretis, Demetriades, & Luintel, 2001). Results are significant and follow hypothesis that economic growth has a positive relationship with SMC. It is consistent with literature, as stock market is the best indicator to forecast the economic growth and stock price (Hussain, Zia-ur-Rehman, & Rza, 2012).

There is strong evidence to prove that SMC is significant at 1% significance level ($\boldsymbol{\alpha}$=0.01) with positive impact towards economic growth in Egypt and South Africa. (Enisan & Olufisayo, 2009). However, the result contradicts in the country of Cote D' Ivoire, Kenya, Morocco, Nigeria and Zimbabwe, where the variable is not significant even at 10% of significance level.

On the other hand, according to Granger Causality analysis conducted by Carp (2012) with the case of Romanian economy as evidence, the SMC does not exert any impact on economic growth rates.

This paper expected that SMC has a positive relationship toward economic growth, due to it is supported by quite large number of previous research. In term of data, this paper used the quarterly stock market capitalization in millions of Japanese Yen to study whether SMC bring an impact on GDP.

2.1.6 Domestic Credit Ratio (DCR)

According to Egert, Backe, and Zumer (2007) domestic credit to private sector as percentage of Gross Domestic Product (GDP) can be described as the degree of financial liberalization. Based on the journal's result, this Domestic Credit Ratio (DCR) variable showed that DCR is significant and negatively related to economic growth.

Marques, Fuinhas, and Marques (2013) suggested that DCR is a variable that are obtained from the total domestic credit divided by the nominal GDP. This variable is often used as the indication of banking system development. The researchers also suggested that DCR can measure the degree of financial development. This variable considers the domestic credit can be justified by huge amounts of credit which may has effects on GDP. Besides, this variable is suggested in an economic that has high dependency on bank credit. In the research, Marques et al. (2013) reported that DCR has a negative impact toward economic growth, when domestic credit ratio increases that mean

banking sector play a major role in the country's economy, at the same time corporate will not depend on equity to rise up their capital too much and productivity. As a result, the economic growth of the respective country will be reducing.

Saci, Giorgioni, and Holden (2009) stated that the domestic credit to the private sector in the percentage of GDP may differentiate between credit issues to private sector and to government sector. This variable able to capture the ability of intermediaries in evaluates information and determine profitability of those investment projects. Higher ratio of DCR indicates that there might have a lower transaction costs and high level of financial services. Therefore, it generated a greater financial intermediary development in that nation and it might result in the negative impact toward economic growth. The problem of moral hazard from firms and over lending from the bank to public will make a nation's economic growth decline (De Gregorio & Guidotti, 1995). As a result, the researchers found that there is significantly negative expected sign in the result. Similar to the journal above, Aamir, Sharif, and Nisar (2011) also suggested that DCR can be used as an independent variable to determine the economic growth. They achieved the result that this variable has negative relationship with the dependent variable and it was an important factor which may affect economic growth.

This paper expected that DCR has negative relationship with the economic growth. The reason behind the negative relationship is explained by higher DCR indicated that most of the firm rely more on debt in financing their business rather than equity. Besides, when most of the firms able to obtain the loan from bank easily then moral hazard and default risk might occurred and lead to the decrease in economic growth as the nation's bank might be collapse, if the bank unable to receive repayment from those borrowing firms.

Furthermore, DCR provided by banking sector in the percentage of GDP is being employed in this paper to find out the whether there is any relationship between DCR and GDP.

2.1.7 Investment Ratio (INV)

Investment per Gross Domestic Product (investment ratio) can be defined as share of investment in fixed assets in Gross Domestic Product (GDP) (Ouyang & Fu, 2012). While in the study of Marques, Fuinhas, and Marques (2013) Investment Ratio (INV) is calculated by Gross Fixed Capital Formation. In addition, capital formation refers to the net accumulation of physical assets that included equipment, building and other intermediary goods ("Definition of capital formation", n.d.). By referring to the same source, in average, the larger the amount of capital formation, the more quickly of an economy can grow in their aggregate income.

According to Vinayagathasan (2013), the study found that INV can stimulate a country economic growth, because their empirical result showed significant at the 1% significance level. Besides, the researcher also suggested that INV has a positive impact on GDP with using the standard growth model.

Another previous research stated that higher INV will lead to fast growth in gross domestic product per capita (Li & Liu, 2005). In Bittencourt (2012) study, the researcher included INV as one of the controls variable in their estimation model. INV is the only control variable and it showed that there is

a significant positive relationship toward economic growth, which is also similar towards the researchers' expected sign.

Furthermore, in the research paper did by Marques, Fuinhas, and Marques (2013), the researchers also used INV as their control variable. Besides, they found that the INV has a significant and positive impact toward GDP. However, the study also point out that the INV does not granger cause economic growth, which is evidence from the investment in Portugal.

With the ordinary least square (OLS) model and fixed model, the researchers successfully found that the INV has a positive and significant relationship at the 1% significance level in every regression (Ouyang & Fu, 2012). In the same study, with the high growth elasticity between INV and economic growth that showed in their finding, so the researchers conclude that the INV is one of the biggest driving forces behind domestic economic growth.

In short, the expected sign for INV for this paper is positive, because the increase of INV can encourage the growth of the country economic. For example, when investors make an investment toward a company, the company will accumulate extra capital for producing more goods with good quality for export and domestic use. Therefore, the economics of a country will grow, as the productivity, revenue and the consumption of the products increase. In this paper, this paper used the Japan Gross Fixed Capital Formation (GFCF) in billions of Japanese Yen to investigate the degree INV influence on GDP.

2.2 Review of Relevant Theoretical Models

2.2.1 Fisher Effect Theory

Fisher effect is a fundamental theory of finance and economics in studies, which links interest rate, inflation and exchange rate (Shalishali, 2012). In the study, the researcher mentioned that this theory is same as Purchasing Power Parity (PPP) theory, Fisher effect also ascribed on the changes in interest rate differentials to exchange rate.

In the study of Chaudhry et al. (2011), Fisher effect theory is used by researchers to examine on the relationship between inflation, exchange rate and interest rate for four countries within the period of 2003-2008 by using both yearly and quarterly data. The research finds out that there is a significant positive correlation between interest rate differential and changes in exchange rate.

Besides, Fisher effect theory stated that there is parallel with the same amount or percentage of moving between inflation rate and interest rate ("Definition of Fisher Effect", n.d.). According to Foote (2010), if government controls money supply, it can help in determining inflation rate and it will affect the movement of interest rate at the same time. Therefore, government need to concern about the amount of money supply in the market, because it definitely has an impact on economic growth.

2.2.2 Endogenous Growth Theory

This research cannot apply neo-classical models for economic growth because the theory is limited to Foreign Direct Investment (FDI) for determining the level effect on growth due to diminishing returns to capital. As a result, endogenous growth theory is more appropriate theory to apply in this paper, as it provides a framework in studying the relationship between FDI and Gross Domestic Product (GDP) that makes it possible to take the characteristics of FDI into account (Johnson, 2005).

Normally, FDI will move from capital-surplus countries to capital-deficit economies, because those countries have lower rental rate of assets and their productivity is enhanced by increasing labour productivity and also introducing new technology embedded in the capital. Therefore, on theoretical grounds, FDI may positively affect economic growth of a nation. However, FDI may negatively affect the economic growth, because it may deteriorate competition and may corrupt the development path of the country in its own interests (Turkcan, Duman, & Yetkiner, 2008).

Moreover, as the stock market provides means for a company to change ownership, diversify their portfolio risk, and not disrupt the production process of the company, so stock market able to enhance economic growth (Levine, 1991). This is because without stock market, lenders as well as investors might face liquidity problems and it would force investors and firms to repay loan that they used to invest in stock by liquidating all or partially of their owned assets. Thus, this situation will lower the firm's productivity, as those assets including their fixed assets that they used for their production is being sold.

Boyd and Smith (1998) suggested that endogenous growth model is a framework in which capital formation is financed by issuing equity and debt. The study showed that investors prefer to invest in equity rather than debt. This is due to the decreasing of comparative cost of capital when a country experiencing growth. Those firms are able to promote country's growth, whenever there is a huge accumulation of capital from firms. On the other hand, there is a bidirectional linkage between stock markets and GDP that is found by Boyd and Smith (1998)

Researchers Enisan and Olufisayo (2009), using endogenous type of model found that economic growth may not only be subjected to the effect of those factors including the relatively efficiency, liquidity and size of the stock markets, it also might influence the quality of the economic and social environment of the country. In addition, that study showed that stock market development has long run impact toward GDP and it was significantly positive, with the evidence from seven sub-Saharan African Countries.

2.2.3 Keynesian Economics Theory

Keynesian economics is a theory of economy's total spending, also known as aggregate demand and its effects on output and inflation (Blinder, n.d.). The researcher Blinder, (n.d.) stated that output will fluctuate when there are some changes in the spending component such as consumption, investment as well as government expenditures. This indicates that when consumption increases, output will increases by holding other variables constant, and this fluctuation is due to the stiffness of price. The welfare of the economic will decline as the

macroeconomic fluctuates. The researcher also mentioned that household savings will increase as they reduce consumption because a dollar saved today will act as a compensation for an increase in the future tax liabilities, therefore government's deficit will be offset by private saving. So, when Japan's deficit rises with steady government spending, aggregate demand also increases.

The above foundational mock-ups of Japan lead to a notion where, as consumption, government spending, net of export, and investment increase, the aggregate demand increases as well, hence causally, increases Japan's economic growth.

According to Vaona (2012), investment increases as the opportunity cost of holding reserves and urge of lending rises due to the increase of nominal interest rate and money growth, these will in turn promote the economic growth of a nation. The researcher also described that exceeding nominal interest rate threshold level will worsen borrowing through credit rationing, thus effectively diminishing the economic growth. High nominal interest rate of Japan holds the nature to unfavourably impede its economic growth.

Government spending shock will positively affect the relationship between inflation and economic growth whereby consumption increases the aggregate demand (Canzoneri et al., 2006). According to Investopedia, "Keynesian Economics", (n.d.), when economy's aggregate demand dropped, the jobs and production reduces, resulting in declination in wages and prices. So, employment and capital investment can be increased by lowering the inflation and wages and therefore, promoting the economic growth. This indicates that there is a negative relationship between inflation and economic growth,

whereas there is a positive relationship between investment and economic growth.

Klein (1950) also stated that household income can be promoted when taxes on varies income are reduced and thus, increases consumption and investment. Therefore, promotes the aggregate demand and economic growth.

Keynesian economics theory also stated that trade position can be enhanced by combining the right fusion of fiscal and monetary policy, therefore promoting the economic growth (Hart, 2011). In the research of Klein (1950) described how price movement can be stimulated by giving control over fiscal policy to the government. Japan's government has control over fiscal policy, and the coursings of fiscal policies can be independently formulated. Thus price increments will reduce the wages and unemployment, and this is known as expansionary of aggregate demand (Nordhaus & Tobin, 1972). The researchers also mentioned that expansion of aggregate demand will lead to full employment whereby there will be maximum of aggregate supply from the labor force to an extend where there will be no increase in employments and output. So, increase of aggregate demand undeniably promotes the economic growth.

2.2.4 Schumpeter's Theory of Economic Development

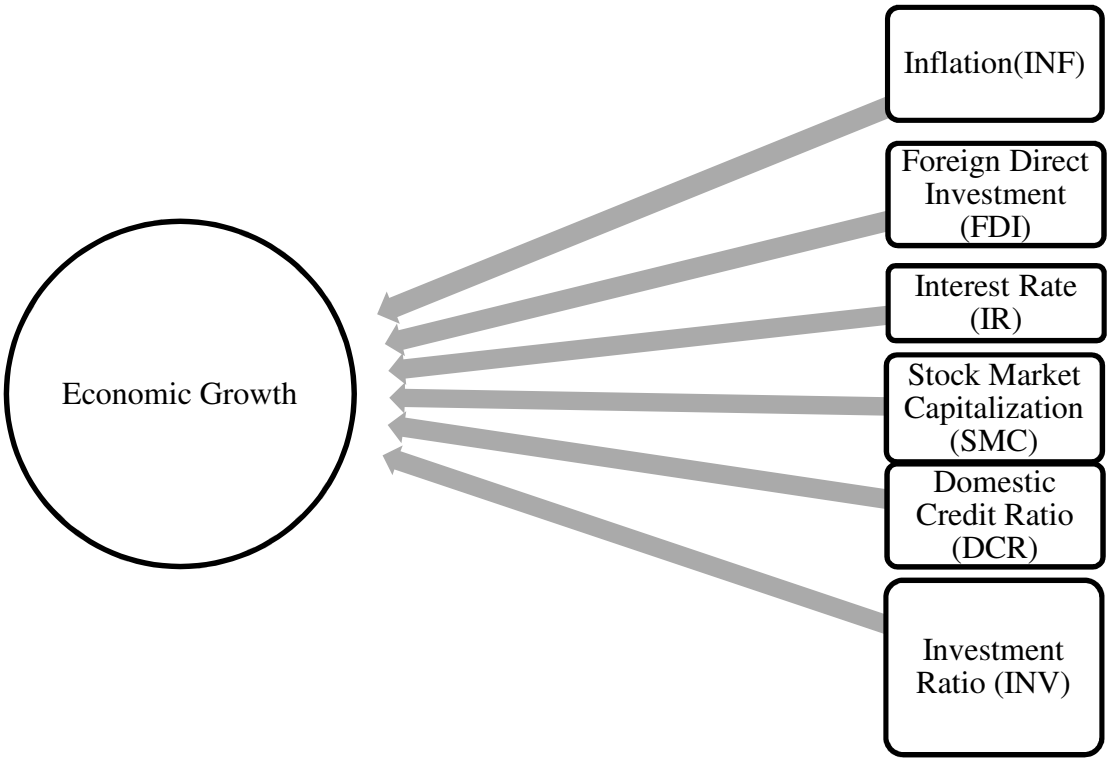
The Schumpeter's theory of Economic Development revolves around the nature of organizations' business innovation's nature of necessitating the use of capital through credit. Schumpeter's theory explicates the linkage of credit and innovation, describing them with the implication of causality. Schumpeter coined in the theory that capital made into existence from credit will be used by entrepreneurs to initiate new groupings and shifting the production to new paths, thus creating innovation. Bankers and lenders of bank notes and depositors' deposit hold the action of expanding the money supply, hence creating sources of innovation, development, and investment that require the use of capital (Foster, 1984).

The emergence latency of new firms or products inevitably relies on innovation, thus dictating the absolute association of credit. Schumpeter posited and confirmed that credit is indeed important, implying an indirect intervention on economic growth, because if there're activities in the economy that pertain emergence of new firms and products, there's economic development, and subsequently, potential growth (Croitoru, 2012).

2.3 Proposed Theoretical / Conceptual Framework

Figure 2.1: Factors That Influence Economic Growth in Japan Framework

From 1998-2012



$$GDP_t = \alpha_1 - \beta_1 INF_t + \beta_2 FDI_t + \beta_3 IR_t + \beta_4 SMC_t - \beta_5 DCR_t + \beta_6 INV_t + \varepsilon_t$$

Note: Estimated model formed based on the expected sign of this paper.

This research paper investigated the effect of Inflation (INF), Foreign Direct Investment (FDI), Interest Rate (IR), Stock Market Capitalization (SMC), Domestic Credit Ratio (DCR) and Investment Ratio (INV) in Japan towards the economic growth in Japan, using quarterly data from 1998 quarter 1 to 2012 quarter 4. The paper examined the determinants of economic growth in Japan that serves to contribute policy makers and parties of interest.

It is the measurement of increase in general level of prices of commodities and value of money. The research of Hussain and Malik (2011) suggested that there is a negative bond between Gross Domestic Product (GDP) and INF.

The second independent variable FDI is the indicator of foreign direct investment in Japan. Adams (2009) reported the result of growth regression and FDI, which implied that the factor has significant positive relationship with economic growth in Japan.

The third independent variable is IR. The researchers found that with the higher IR in the market will bring the banking system have positively and significantly effects on output growth (Chang & Huang, 2010).

The fourth independent variable is SMC. Both of the study of Levine and Zervos (1996; 1998) also showed that SMC has a positive impact which can enhance economic growth.

The fifth independent variable is DCR which is explained by Saci et al. (2009) indicates that the DCR is negatively and significantly correlated with economic growth. Besides, Aamir et al. (2011) also suggested the relationship is negatively and significant.

The very last independent variable is INV. In the study of Cooray (2010), he concluded that the INV has relative significant impact toward the economic growth. Besides, Ouyang, and Fu, (2012) found that the relationship between INV and GDP is positive.

2.5 Conclusion

This paper used six independent variables comprising of Inflation, Foreign Direct Investment, Interest Rate, Stock Market Capitalization, Domestic Credit Ratio, and Investment Ratio. In accordance and concordance with the statements and findings in many referenced previous studies, this paper is able to stipulate that those variables affecting the outcome in determining the Economic growth. To go in-depth and fulfil the purpose of this paper, data were obtained from reliable sources. The research methodology is also planned out in a criticizing manner to ensure the best outcome of the analysis.

CHAPTER 3: METHODOLOGY

3.0 Introduction

In this chapter, researchers introduced all steps, procedures and techniques that were adopted in researching the effect of macroeconomic factors, financial development and stock market development toward Japan's economic growth. Besides, this paper included a total of one macroeconomic factor, one financial development factor and one stock market development factor. All of these independent variables are in the form of quarterly data which are from 1998 quarter 1 to 2012 quarter 4, so there are a total of 60 observations.

In order for researchers to make a better choice in selecting the right methodology for this paper, the researchers referred to the review of previous studies that has done in Chapter 2 as that gave researchers the information about the related problems and limitations that previous researchers faced which provides and leads the researchers to choose methods and tests that work well in this paper. As a result, researchers able to give a valid and significant result in this paper.

Lastly, the following sub-topic in this chapter discussed on the data collection methods, sampling design, data processing and methodology used in data analysis.

3.1 Data Collection Method

This paper primarily used Science Direct, ProQuest and EBSCOhost online database that provided by UTAR library in the search of previous studies. The purpose of study on the previous research is for researchers to have a better understanding and increasing the knowledge in the study (Boote & Beile, 2005).

3.1.1 Secondary Data

This paper mainly focused on secondary data. Secondary data is defined as the data that have already existed (Andrews et al., 2012). Besides, Heaton (2004) defined secondary data analysis as a research which used the existing data to verify either for a new research or justify the previous researches. This paper used secondary data, because it is less costly than acquiring primary data and it does not lead to unnecessary work.

As a result, the independent variables' data included Inflation (INF), Foreign Direct Investment (FDI), Interest Rrate (IR), Stock Market Capitalization (SMC), Domestic Credit Ratio (DCR), Investment Ratio (INV) as well as the dependent variable, Gross Domestic Product per capita (GDP) were extracted from Datastream. This paper employed quarterly data from 1998 quarter 1 to 2012 quarter 4, consequently the total number of observation is 60.

Table 3.1.1 Data Measurement

Independent variables	Measurement	Source	Supported by
Inflation (INF)	Consumer price index	UTAR library's DataStream	Chong, Tan, and Baharumshah (2001); Fountas (2010)
Foreign Direct Investment (FDI)	FDI inward in the percentage of GDP (% of GDP)	UTAR library's DataStream	Bengoa, and Sanchez-Robles (2003); Hsiao and Hsiao (2006)
Interest Rate (IR)	Treasury-bill interest rate	UTAR library's DataStream	Chong, Tan, and Baharumshah (2001)
Stock Market Capitalization (LGSMC)	Stock market capitalization in million of Japanese Yen	UTAR library's DataStream	Marques et at. (2013); Carp (2012)
Domestic Credit Ratio (DCR)	Domestic credit provided by banking sector in the percentage of GDP	UTAR library's DataStream	Marques et al. (2013)
Investment Ratio (LGINV)	Gross Fixed Capital Formation (GFCF) in billion of Japanese Yen	UTAR library's DataStream	Marques et al. (2013)

Dependent Variable	Measurement	Source	Supported by
Gross Domestic Product (LGGDP)	Nominal Gross Domestic Product	UTAR library's DataStream	Ogbonna et al. (2013)

3.2 Sampling Design

3.2.1 Target Population – Japan

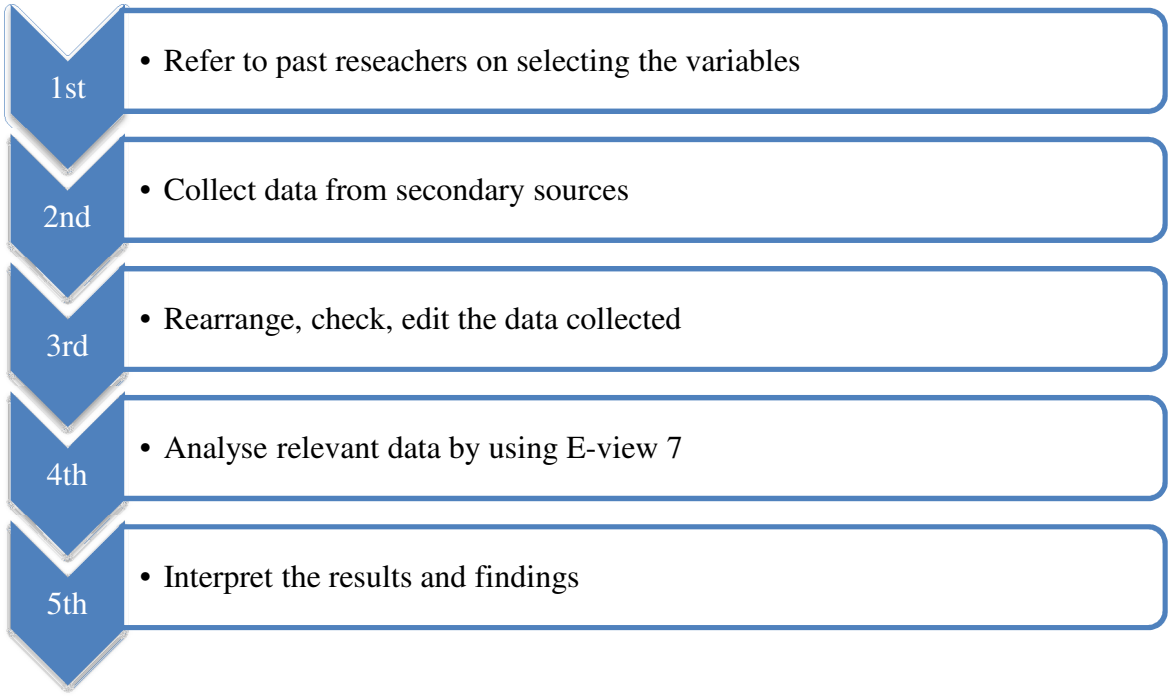
Kyung (2011) described that Japan has the fourth largest purchasing power parity (PPP) as it's the world's third main economy counting the by nominal Gross Domestic Product (GDP). According to the "The world factbook-Japan", (n.d.), Japan has the population of 127,253,075 as estimated at July 2013 thus, making it the world's tenth most populated country with 91.3% of total population in urban areas.

Growth rate is used to determine how the changing needs of a country's people and infrastructure will burden that a country. "The world factbook-Japan", (n.d.) stated that Japan has no net migration**,** population growth rate of -0.1% and this net population loss is recent due to the fall in birth rates, and is said to be the third highest life expectancies in the world with 84.19 years of age as estimated in year 2013.

In 2008, Ministry of Justice published a statistics stated that since 1987, the registered foreign nationals occupied in Japan increase in numbers each year thus**,** the total population of Japan has increased every year as well. Manabu and Kazumasa (2010) concluded that economy in Japan has improved with the presence of immigration and it contributed in the long-run demographic trend of Japan.

3.3 Data Processing

Chart 3.3.1: Flow of Data Processing



Generally, the data processing in this paper is divided into five stages as shown in the graph above. The first step of the data processing is selecting the independent variables based on the previous researches. The selected independent variables in this paper are important and it was tested and totally supported by past researchers.

After the researchers have confirmed which suitable data to be collected, data are collected from various secondary sources such as DataStream and saved into the spread sheet. Then, the data are rearranged accordingly, re-finalised and are edited by the researchers so that it has the same years of observation among all of the variables.

In addition, researchers calculated a few data such as stock market capitalization and domestic credit ratio. For stock market capitalization, researchers converted annual data to quarterly using the formulas stated in the previous study of Marques et al. (2013), which was as following:

First step: compute a factor (R) relating the two variables:

$$R = \frac{\sum_{T=1}^{N} TOPIXQUATEt}{\sum_{T=1}^{n} TOPIXCAPt}$$

Where $TOPIXQuate_t$ and $TOPIXCAP_t$ are name as the TOPIX stock quote and market capitalization, respectively.

Second step: find the quarterly value with using:

$S_t = TOPIXQuate_t / R$

In order to obtain the domestic credit ratio, this paper used the total domestic credit in quarterly divided by nominal Gross Domestic Product (GDP) in quarterly (Marques et al., 2013)

The formula is stated as below:

$$\text{Domestic Credit Ratio} = \frac{\text{Total Domestic Credit}}{\text{Nominal GDP}}$$

Next, the relevant data are imported directly from Excel to E-views 7. However, the data imported to E-views 7 are checked for several times in order to ensure there was no error in the process of transmitting. E-views 7 is used to determine the results for the paper's estimated model. Lastly, the outcome and results from the E-views 7 were interpreted in the later stage with the aid of tables and figures as well.

3.4 Data Analysis

This paper used E-views 7 to conduct and examine regression analysis.

3.4.1 E-Views 7

E-Views 7 is used to determine the econometric analysis such as time series analysis, cross-sectional analysis, panel data analysis and forecasting. The E-Views 7 involved the usage of spreadsheet and database technologies with statistical software and it usually able to access Organization for Economic Co-operation and Development (OECD) databases. Besides, it aided in supporting undocumented file format for data storage.

According to Startz (2009), E-Views 7 is used to estimate both simple regressions and multiple regressions. All the information of each estimated coefficient is shown in the end of the results. Furthermore, E-Views 7 can provide completely summary information for the estimated equation. As mentioned above, this paper used E-Views 7 to run estimation on multiple regression models and thus, diagnostic checking was conducted to determine whether there are existence of autocorrelation, heteroscedasticity and multicollinearity on estimated equation. On the other hand, through the usage of E-Views 7, researchers are able to conduct normality test and model specification test as well as unit root test, Johansen co-integration test and granger causality test.

3.4.2 Multiple Linear Regressions

According to Gujarati and Porter (2009), multiple linear regressions model is defined as linear regression model which contains of two or more independent variables (X_i) with respect to one dependent variable (Y). The function of an independent variables (X_i) were treated as an explanatory variables in which it can be used to predict the results and relationship with respects to the dependent variable (Y).

Overall, this paper used multiple linear regression model as it included more than one independent variables to explain economic growth. This is because there are more than one variable that will influence the results in real economic condition. In order to avoid the estimated result to have a huge different from actual result, so this paper included all relevant and important independent variables into the equation. Therefore, the estimated output is more accurate for policy maker to make decision for boost up Japan economic growth. In this paper, the researchers have included six independent variables into the estimated model as follows:

$$GDP_t = \alpha_1 + \beta_1 INF_t + \beta_2 FDI_t + \beta_3 IR_t + \beta_4 SMC_t + \beta_5 DCR_t + \beta_6 INV_t + \varepsilon_t$$

Where GDP referred to Gross Domestic Product or Economic Growth in Japan, α defined as coefficients that explained the degree of affecting GDP, INF referred to Inflation, FDI referred to Foreign Direct Investment, IR referred to Interest Rate, SMC referred to Stock Market Capitalization, DCR referred to Domestic Credit Ratio, and INV referred to Investment Ratio.

The parameter (β) in the model should be in linear form and it should not have any relationship among the independent variables. This is because multicollinearity problem will occurs and it will leads to biased results when parameter (β) has relationship with the independent variables. On the other hand, the increased in number of independent variables do not influence value of R^2 thus, the researchers used the adjusted R^2 instead of R^2 to interpret the data as R^2 take into the account of sample size and number of independent variable that included in the model.

3.4.3 F-test Statistic

According to Gujarati and Porter (2009), F-test function is to measure the overall significance of the estimated linear regression. F-test can also used to compare the statistical models and determine whether the estimated model is complemented with the population from the data employed.

F-test statistic can determine and identify P-value in which it explained the feasibility of getting the results through chance. The researchers reject the null hypothesis if the result is less than either 0.01 (1%), 0.05 (5%), or 0.10 (10%). If the null hypothesis is being rejected then researchers concluded that the estimated model is significant in explaining the economic growth in Japan. As a result, this paper applies F-test for checking the overall significance with the following hypothesis by using the 1% significance level as critical value.

Hypothesis:

H_0: $\beta_1 = \beta_2 = \beta_3 = \ldots = \beta_i = 0$

H_1: At least one of the β_i is not equal to zero

Where β_i = 1, 2, 3, 4, 5, 6

3.4.4 T-test Statistic

By using Statistical Data Analysis with two or more independent variables, T-test is used to perform the hypothesis testing on each independent variable (Lucey, 2002). T-tests always treat the total sample populations as normally distributed with the condition that all variances must be equalled.

T-test used the similar method as F-test whereby P-value is used to determine whether every independent variable has a significant effect on the dependent variable. If the result is less than either 0.01 (1%), 0.05 (5%), or 0.10 (10%), the researchers concluded that there is significant results between the economic growth and independent variables which are Inflation, Foreign Direct Investment, Interest Rate, Stock Market Capitalization, Domestic Credit Ratio and Investment Ratio. In another word, the researchers tested the significance of all independent variables by using 1% significance level. If the null hypothesis is rejected then this paper concluded that the particular independent variable is significant in explaining Japan's economic growth. The hypothesis for this test is:

Hypothesis:

H_0: $\beta_i = 0$

H_1: $\beta_i \neq 0$

Where $\beta_i = 1, 2, 3, 4, 5, 6$

3.4.5 Diagnostic Checking

During the phase of diagnostic checking, researchers have conducted a few hypotheses testing to determine whether the estimated model have the problem of autocorrelation, heteroscedasticity and multicollinearity. Next, researchers performed model specification test as well as normality test. After that, the researchers proceeded decision making process and addressing the problems that occurred in the estimated model.

3.4.5.1 Autocorrelation

According to Gujarati and Porter (2009), autocorrelation is explained as the correlation between the error term at period t and the error term before period t. For time series data, it is possible for disturbance terms to have correlation with each other, therefore autocorrelation problem might occur. Besides, autocorrelation may occur when important variables have been omitted in which the variables should have been

included in the estimated model or wrong functional form is used. The existence of autocorrelation problem will leads to biased results.

In order to detect the autocorrelation problem, researchers performed the Breusch-Godfrey serial Correlation LM test. When a research data sample size is less than 30 observations, the researchers may choose an alternative way to perform the results such as graphical method to detect autocorrelation. The reason for using graphical method is because it can deliver a more precise result compared to hypothesis testing. In conclusion, final hypothesis testing results can be shown through the graphical result. In this paper, LM test is used to detect the autocorrelation problem with the critical value of 1% significance level and the hypothesis for autocorrelation test is written as:

Hypothesis:

H_0: There is no autocorrelation problem.

H_1: There is autocorrelation problem.

3.4.5.2 Heteroscedasticity

Another test that the researchers have run is heteroscedasticity test to determine whether the model has a constant variance of error terms. According to Gujarati and Porter (2009), the estimated model that consist of heteroscedasticity, the error term will not have a constant variance. The paper used ARCH test to determine whether there is

heteroscedasticity problem in the estimated model. In short, if heteroscedasticity problem exist in the estimated model then the variance will no longer efficient and it will influence the result and leads to a bias conclusion.

If there is a small number of sample size which it is less than 30 observations, researchers need to use the graphical method to determine heteroscedasticity problem as the graphical method can provide a more precise result than the hypothesis testing. Whenever there is a heteroscedasticity in the estimated model, then researchers need to correct the standard errors of estimators in the ordinary least square by using White's Heteroscedasticity-consistent variances and Standard Errors. In addition this paper used ARCH test with 1% significance level to detect heteroscedasticity problem, as the sample size is large. While the hypothesis is written as:

Hypothesis:

H_0: There is no heteroscedasticity problem.

H_1: There is heteroscedasticity problem.

3.4.5.3 Multicollinearity

Researchers have conducted multicollinearity test to detect whether there is high correlation between independent variables to each other in the estimated model (Gujarati & Porter, 2009). Multicollinearity problem led regression coefficients to have an opposite results as the actual relationship. Therefore if there is an existence of high degree multicollinearity, researchers cannot interpret the results by just relying on individual coefficient it will provide misleading information on the relationships between all the independent variables. According to "The instat guide to choosing and interpretating statistical tests", (2003), the results will become insignificant when multicollinearity present. The multicollinerity may affect those important variables and caused the standard error to be larger than the actual standard error.

The presence of multicollinearity can be determined by using the pair-wise analysis as well as variable inflation factor (VIF). The estimated model is said to have multicollinearity problem whenever the correlation in pair-wise analysis is greater than 0.8 with high R-squared and high VIF ("Multicolinearity in multiple regression", 2011).

3.4.5.4 Model Specification and Normality test

The researchers should choose only those relevant independent variables to be included into the estimated model and excluded those irrelevant independent variables (Gujarati & Porter, 2009). Regression analysis contained three stages, firstly, the model specification, followed by the parameter estimation and finally the parameter interpretation. In addition, Ramsey RESET test is used for the model specification test with the critical value of 1% significance level. While the hypothesis for model specification is:

Hypothesis:

H_0: The model is correctly specified.

H_1: The model is not correctly specified.

There are four categories of model specification error. The first type is where the researchers omitted an important independent variable and it may lead to either heteroscedasticity or autocorrelation, or both. Consequently, the parameter in the estimated model will become biased and inconsistent. On the other hand, the standard error of the coefficients and variances will be wrongly estimated and it will form an invalid hypothesis-testing. Next, the researchers might include an irrelevant independent variable whereby the inclusion of irrelevant or omission of relevant independent variable may cause serious problem in which the estimated model become invalid, biased and inconsistent. Lastly, model specification error is due to wrong functional form of

the variables such as dependent variable and independent variables in the estimated model (Gujarati & Porter, 2009).

Next, the normality test is used to determine whether the error term in the estimated model is normally distributed thus, Jarque-Bera normality test is employed. The results will be biased if the error term is not normally distributed (Gujarati & Porter, 2009). While the hypothesis for this test is:

Hypothesis:

H_0: Error Term is normally distributed.

H_1: Error Term is not normally distributed.

Therefore, before conducting any statistical tests, researchers have ensured that the estimated model is well specified with normally distributed error term.

3.4.6 Inferential Analysis

In this research paper, both Augmented Dickey-Fuller (ADF) and Phillips-Peron (PP) test are under the category of unit root test and are used to investigate the relationship between the dependent variable and independent variables.

3.4.6.1 Unit Root Test

The purpose of using unit root test is to create an order of each of the variable's integration. In analyzing the effects of the macroeconomic factors, financial development and stock market development on the economic growth, firstly, this research paper checked the stationary properties of those variables. The test on level of stationary is very important because biased results can be avoided. If there is a constant mean, variances and autocovariances in every of the lag then it can be defined that the variables are stationary (Rahman & Salahuddin, 2010). The test results will be more accurate, if the variables are stationary. In a nutshell, this paper used both Augmented Dickey-Fuller (ADF) test and Phillips-Perron (PP) test to determine the form of level as well as the form of first difference to check the stationarity of the variables. While the hypothesis is written as:

Hypothesis:

H_0: LGGDP/ INF/ FDI/ IR/ LGSMC/ DCR/ LGINV is not stationary and has a unit root.

H_1: LGGDP/ INF/ FDI/ IR/ LGSMC/ DCR/ LGINV is stationary and do not contain unit root.

Note: LGGDP is known as Japan's Gross Domestic Product; INF is known as Inflation; FDI is known as Foreign Direct Investment; IR is known as Interest Rate; LGSMC is known as Stock Market Capitalization; DCR is known as Domestic Credit Ratio; LGINV is known as Investment Ratio

3.4.6.1.1 Augmented Dickey-Fuller (ADF)

ADF is considered as test under the category of unit root in which contains of time series sample. The rule of thumb states that the Augmented Dickey–Fuller (ADF) statistic in the test will always be a negative numerated value. Smaller the negative values, the more likely the null hypothesis being rejected and concluded that unit root do not exist in this paper's estimated model. This paper used ADF because ADF can investigate the coefficients of the estimated model. ADF consists of running and estimate of the series in the level as well as first difference, which is lagged one in the series (Al-Zoubi & Al-Sharkas, 2011).

3.4.6.1.2 Phillips-Perron (PP)

Unit root test also consist of Philips-Perron (PP) test that is similar to ADF. PP test is conducted in a similar method, but it used automatic correlation to control higher order of serial correlation (Asmy et al., 2009). If the PP as well as ADF test unable to conclude that the estimated model is stationary in level form, but able to find out that there is a stationary in the first difference form then this paper can conclude that the variables are integrated of order one (Sari & Soytas, 2003).

3.4.6.2 Johansen Co-integration Test

Next, researchers conducted the co-integration test by employing Johansen (1998) methodology, because it has two advantages over other alternatives. First, it relaxes the assumption that the co-integrating vector is unique, second, when takes the co-integrating vectors into account, it has taken the short-run dynamics of the system (Dolado, Gonzalo, & Marmol, 2000). Co-integration test is implemented to find out whether there is a long term equilibrium relationship in the estimated model (Johansen & Juselius, 1990). In order to have a well performing co-integration test, the researchers used correlogram to determine the number of lag length to be used, because Johansen co-integration test is sensitive in terms of the usage of the number of lag length (Thangavelu et al., 2004). While the hypothesis is written as:

Hypothesis:

H_0: Long run relationship does not exist between variables

H_1: Long-run relationship exists between variables.

3.4.6.3 Vector Error Correction Model (VECM)

The short term and long term effects of this paper's time series are estimated by using VECM. VECM is particularly useful in testing integrated data and stationary data (Davidson et al., 1978). In this paper, the main purpose of using this model is to directly estimate the speed of the dependent variable returning to equilibrium after the changes in an independent variable. If the two variables in linear combination can be stationary, co-integration then occurred, and the relationship can be used to develop a superior model that can focus more on long-run characteristic in the Johansen test (Engle & Granger, 1987).

3.4.6.4 Granger Causality Test

Granger causality test is suggested and implemented by Clive Granger in 1969 with the function of determine the causality between variables, which is to find out whether one variable can be used to forecast another (Harasheh & Abu-Libdeh, 2011). In another words, it is used

to determine whether one event that happened before able to predict the next event that likely will occur in the future (Gujarati & Porter, 2009). Granger causality in the context of a vector error correction model (VECM) are used to explore the impact of the stock market development, financial development and macroeconomic variables to the economic growth as suggested by Chong et al. (2001).

Granger causality test is popular among many researches in testing the relationship between various variables to the economic growth in different countries around the world (Enisan & Olufisayo, 2009; Suliman Zakaria & Hala Ahmed Dafaalla, 2011; Thangavelu et al., 2004; Muhsin et al., 2011). For instance, Enisan and Olufisayo (2009) used granger causality test to determine the causality relationship for both stock market development and economic growth. The test was also employed by Suliman Zakaria and Hala Ahmed Dafaalla (2011) to check whether there is long-run relationship for both the stock market development and economic growth. The Granger procedure is used because it is a more powerful and simple method compared to other tests in testing the causal relationship (Granger, 1986).

Ibrahim (1999) suggested that if the estimated model is not stationary and co-integrated with each other then granger causality test is not suitable to be conducted, as the results will not be biased. In this paper, granger causality test is one of the tests that this paper used, so this paper has listed out the hypothesis as follow:

Hypothesis:

H_0: LGGDP do not granger caused by β_i in short run.

H_1: LGGDP do granger caused by β_i in short run.

Where β_i is known as

β_1 INF is known as Inflation

β_2 FDI is known as Foreign Direct Investment

β_3 IR is known as Interest Rate

β_4 SMC is known as Stock Market Capitalization

β_5 DCR is known as Domestic Credit Ratio

β_6 INV is known as Investment Ratio.

3.4.6.5 Variance Decomposition Test

According to Ndako (n.d.), the variance decomposition test is used to identify the short run and long run dynamics between the variables in the system. Based on the same research, it proposed that through the variance decomposition test, the researchers are able to figure out how each individual variable response is shocked by other variables in the VAR model. Besides, the variance decomposition test provides proportion of the movement in sequence based on their own shock and shocks of other variables (Ndako, n.d.). Thereby this way, the change of variable will reflects to its own shock and how it can be shock by other variables. While for the research of Neumann and Vanrolleghem (2011), the variance decomposition test has been used to evaluate how range of inputs beneficial to the variance of the design volume. This paper applied this test with the following hypothesis.

Hypothesis:

H_0: INF/ FDI/ IR/ LGSMC/ DCR/ LGINV do not have an impact on economic growth (LGGDP)

H_1: INF/ FDI/ IR/ LGSMC/ DCR/ LGINV have an impact on economic growth (LGGDP)

Note: INF is known as Inflation; FDI is known as Foreign Direct Investment; IR is known as Interest Rate; LGSMC is known as Stock Market Capitalization; DCR is known as Domestic Credit Ratio; LGINV is known as Investment Ratio

3.4.6.6 Impulse Response Functions

The researchers have run the impulse response functions (IRF) with the purpose of preparing a fundamental for policy analysis (Lin, 2006). Based on the explanation of Cao and Zhou (2010), the researchers have defined the impulse function as how the responsiveness of the dynamic system to some external change. On the other hand, the impulse response function can determine the impact of any variable to other variables in the system (Lin, 2006). The impulse response functions are chose to identify the dynamic effects of the system during the estimated model has received the impulse. According to Griffiths and Lutkepohl (1990), impulse responses have been used as a powerful tool in determining the interrelationship between those variables of vector autoregression (VAR) model. Basically this tool has used to calculate the estimation variability of estimated impulse response.

3.5 Summary of Test

There are few popular methods that have been employed by previous researchers to study the relationship between economic growth and independent variables. Among these methods is Vector Autoregressive (VAR) modelling. It is employed by Zhang and Wu (2012); Arestis et al. (2011); Thangavelu et al. (2004); Marques et al. (2013); Chong et al. (2001); Hsiao and Hsiao (2006); Arestis and Demetriades (1997) and Carp (2012).

Vector Error Correction Model (VECM) method also is conducted by Zhang and Wu (2012); Arestis et al. (2011); Thangavelu et al. (2004); Marques et al. (2013); Chong et al. (2001); Anwar and Sun (2011) as well as Enisan and Olufisayo (2009).

Hussain and Malik (2011); Tang (2006); Hussain et al. (2012); Bengoa and Sanchez-Robles (2003); Cooray (2010); Barrios et al. (2005); Adams (2009); Ouyang and Fu (2012) and Anwar and Nguyen (2011) conducted their tests by using Ordinary Least Square (OLS) methodology.

Thangavelu et al. (2004) used Granger causality test to determine whether there is a granger cause between economic growth and independent variables. This methodology is also applied by Enisan and Olufisayo (2009); Muhsin et al. (2011); Suliman Zakaria and Hala Ahmed Dafaalla (2011); Hsiao and Hsiao (2006); Carp (2012); Fountas (2010) and Hussain and Malik (2011).

Unit root test is also a famous method that previous researchers used. (Herzer, 2012; Zhang & Wu, 2012; Arestis et al. 2011; Suliman Zakaria & Hala Ahmed Dafaalla, 2011; Thangavelu et al. 2004; Li & Liu, 2004).

On the other hand, Augmented Dickey-Fuller (ADF) test is methods that are frequently used by previous researchers (Zhang and Wu, 2012; Hussain & Malik, 2011; Bittencourt, 2012). Generalised Method of Moments technique (GMM) is also applied by Rabiul (2010); García and Liu (1999); Cooray (2010); Anwar and Nguyen (2011); Anwar and Sun (2011) and Vinayagathasan (2013).

Co-integration test is applied by Hsiao and Hsiao (2006); Hussain and Malik (2011) and Thangavelu et al. (2004).

Chang and Huang (2010) and Aamir et al. (2011) used linear multiple regression. Herzer (2012) and Anwar and Nguyen (2011) used Durbin-wu-hausman test. Ouyang and Fu (2012) as well as Tang (2006) used Two-Stage Least Squares fixed effect regressions.

As a result, this paper has chosen to conduct Unit Root Tests, Johansen Co-integration, Vector Error Correction Model (VECM) and Granger Causality Tests to estimate the data.

3.6 Conclusion

In a nutshell, data used for independent and dependent variables are obtained from the same source, which is DataStream. Besides, this paper listed out a number of tests such as Unit Root Test, Ordinary Least Square, Johansen Co-integration Test and Granger Causality to examine the different relationships on the effect all the factors including macroeconomic factors, financial development as well as stock market development toward economic growth. In the next chapter, this paper discussed on the empirical results that researchers obtained from those selected tests.

CHAPTER 4: DATA ANALYSIS

4.0 Introduction

This paper analyses the time series data and presents the estimated result on the impact of Japan's economic growth with by Ordinary Least Square. Besides, Unit Root Test, Johansen Co-integration Test, Granger Causality Test, Variance Decomposition and Impulse Response Function are used for the inferential analysis on the estimated model. In this chapter, the researchers have included a few tables and figures for a clearer presentation on the finding.

4.1 Ordinary Least Square (OLS)

Economic Model:

$$LGGDP_t = \alpha_1 - \hat{\beta}_1 INF_t - \hat{\beta}_2 FDI_t + \hat{\beta}_3 IR_t + \hat{\beta}_4 LGSMC_t - \hat{\beta}_5 DCR_t + \hat{\beta}_6 LGINV_t + \varepsilon_t$$

$$LGGDP_t = 12.38710 - 0.059955 INF_t - 0.001366 FDI_t + 0.029904\ IR_t + 0.001150 LGSMC_t - 0.007072\ DCR_t + 0.129247 LGINV_t + \varepsilon_t$$

SE	= (0.175288)	(0.009680)	(0.007611)	(0.009988)	(0.010571)	(0.005115)	(0.024826)
T-value	= (70.66706)	(-6.193637)	(-0.179479)	(2.994021)	(0.108800)	(-1.382543)	(5.206208)
P-value	= (0.0000)	(0.0000)*	(0.8582)	(0.0042)*	(0.9138)	(0.1726)	(0.0000)*

R^2 = 0.658318 $\bar{R}^2$ = 0.619637 Degree of freedom = 60 - 6 - 1 = 53

* Significant at 1% significance level

From the above economic model,

Dependent variable:

LGGDP is known as Japan's Gross Domestic Product per capita in LOG form

Independent variables:

β_1 is the coefficient of INF and INF is known as Inflation

β_2 is the coefficient of FDI and FDI is known as Foreign Direct Investment

β_3 is the coefficient of IR and IR is known as Interest Rate

β_4 is the coefficient of LGSMC and LGSMC is known as Stock Market Capitalization in LOG form

β_5 is the coefficient of DCR and DCR is known as Domestic Credit Ratio

β_6 is the coefficient of LGINV and LGINV is known as Investment Ratio in LOG form

Based on output from E-views 7, which is stated on above, this paper briefly mentioned that there are three independent variables which are Inflation (INF), Interest Rate (IR) and Investment Ratio (LGINV) remained significant at 1% significance level.

However, another three independent variables which are Foreign Direct Investment (FDI), Stock Market Capitalization (LGSMC) and Domestic Credit Ratio (DCR) are insignificant at 1% significance level.

Hereby the R^2 can be defined as 65.8318% of total variation in dependent variable (Y) can be explained by variation in independent variables (X_i).

For adjusted R^2, it can be defined as 61.9637% of total variation in dependent variable (Y) can be explained by variation in independent variables (X_i) by taking into account of sample size and number of independent variables that are included in the estimated model.

4.2 Diagnostic Checking

4.2.1 Multicollinearity

Table 4.2.1 Intercorrelation

	LGGDP	INF	FDI	IR	LGSMC	DCR	LGINV
LGGDP	1.000000						
INF	-0.434945	1.000000					
FDI	0.181208	-0.129950	1.000000				
IR	0.594880	-0.210527	0.102976	1.000000			
LGSMC	-0.036726	0.108970	-0.094297	0.277117	1.000000		
DCR	-0.060140	0.001935	0.020225	-0.063917	0.049667	1.000000	
LGINV	0.195273	0.635080	0.098434	0.176261	-0.060080	0.113614	1.000000

Note: LGGDP is known as Japan's Gross Domestic Product; INF is known as Inflation; FDI is known as Foreign Direct Investment; IR is known as Interest Rate; LGSMC is known as Stock Market Capitalization; DCR is known as Domestic Credit Ratio; LGINV is known as Investment Ratio

In this part, pair wise correlation test is used to check for the multicollinearity problem and it showed that there is no muticollinearity problem. Based on Gujarati and Porter (2009), the researchers cannot fully refer to pair-wise correlation test to detect and justify whether there is a multicollinearity problem exist in the model. Therefore, researchers also run auxiliary regression, which is a test on each independent variable (X) on the remaining X variables. After that, this paper used the R^2 in the auxiliary models to calculate the Variance Inflation Factor (VIF) to determine whether there is any correlation between the X variables that are included in the model.

Table 4.2.2 R^2 Values from the Auxiliary Regression and VIF Result

Dependent Variable	R^2 value	VIF value $\left(\frac{1}{1-r^2_{Xi,i=1,2,3,4,5,6}}\right)$
INF	0.607727	2.549245
FDI	0.073657	1.079514
IR	0.368973	1.584718
LGSMC	0.228205	1.295681
DCR	0.061427	1.065447
LGINV	0.600405	2.502534

Note: LGGDP is known as Japan's Gross Domestic Product; INF is known as Inflation; FDI is known as Foreign Direct Investment; IR is known as Interest Rate; LGSMC is known as Stock Market Capitalization; DCR is known as Domestic Credit Ratio; LGINV is known as Investment Ratio

Based on the Table 4.2.2, all of the auxiliary regressions R^2 are low, as mentioned by Gujarati and Porter (2009), if the R^2 exceed the value of 0.8, the multicollinearity exist in the model, results shown that there is no R^2 that exceed this value of 0.8. In addition, as rule of thumb suggested by Hesketh and Everitt (2012), if any of the VIF is greater than 10, there is

multicollinearity problem. Since all the VIF value is between 1 and 10, therefore, there is no multicollinearity problem present in the model.

In short, there is no multicollinearity problem in this paper after the researchers have run pair wise test and VIF test.

4.2.2 Autocorrelation

Table 4.2.3 : Breusch-Godfrey Serial Correlation LM Test Result

Hypothesis	H_0: There is no autocorrelation problem. H_1: There is autocorrelation problem.
Critical value	1% significance level
Decision rule	Reject H_0, if P-value of F-statistic smaller than 0.01
P-value	0.0206
Conclusion	Do not reject Ho.

Based on the result from the LM test, this paper concluded that there is no autocorrelation problem in the estimated model. This is because the P-value of F-statistic in the LM test 0.0206 is greater than 1% of significance level and do not reject H_0. As a result, this paper concluded that the error term between both the time, present time (t_1) and previous time (t_0) are not correlated (Gujarati and Porter, 2009).

4.2.3 Heteroscedasticity

Table 4.2.4 : Heteroscedasticity Test: ARCH Test Result

Hypothesis	H_0: There is no heteroscedasticity problem. H_1: There is heteroscedasticity problem.
Critical value	1% significance level
Decision rule	Reject H_0, if P-value of F-statistic smaller than 0.01
P-value	0.5510
Conclusion	Do not reject Ho.

Based on the result in ARCH test, this paper concluded that the estimated model do not contain heteroscedasticity problem. As the P-value of F-statistic in ARCH test 0.5510 is greater than 1% significance level and do not reject H_0. As a result, the error term in paper's estimated model has a constant variance (Kersting et al., 2007). Besides, the estimated model still consider as best, linear, unbiased and efficient estimator (BLUE).

4.2.4 Model Specification Test

Table 4.2.5 : Ramsey RESET Test Result

Hypothesis	H_0: The model is correctly specified. H_1: The model is not correctly specified.
Critical value	1% significance level
Decision rule	Reject H_0, if P-value of F-statistic smaller than 0.01
P-value	0.0413
Conclusion	Do not reject H_0.

Based on the result in Ramsey RESET test, this paper concluded that the model is correctly specified. As the P-value of F-statistic 0.0413 is greater than 1% significance level and do not reject H_0.

4.2.5 Normality Test

Table 4.2.6 : Jarque-Bera Normality Test Result

Hypothesis	H_0: Error term is normally distributed. H_1: Error term is not normally distributed.
Critical value	1% significance level
Decision rule	Reject H_0, if P-value of Jarque-Bera statistics is smaller than 0.01
P-value	0.018964
Decision	Do not reject H_0.

Based on the result from Jarque-Bera normality test, the paper concluded that the error term in the estimated model is normally distributed. As the P-value

of Jarque-Bera statistic 0.018964 is greater than 1% significance level and do not reject H_0.

4.2.6 T-statistic

This paper used P-value approach to check on the significance of the individual regression coefficient.

Hypothesis:

H_0: $\beta_i = 0$

H_1: $\beta_i \neq 0$

Where $\beta_i = 1, 2, 3, 4, 5, 6$

Critical value: 1% significance level

Decision rule:

Reject H_0, if the P-value of β_i (where $i = 1, 2, 3, 4, 5, 6$) is less than 0.01.

Table 4.2.7 T-statistic Result

Independent Variables	P-value	Decision	Conclusion
β_1=INF	0.0000	Reject H_0	This paper concluded that β_1=INF significantly affects LGGDP
β_2=FDI	0.8582	Do Not Reject H_0	This paper concluded that β_2=FDI insignificantly affects LGGDP
β_3=IR	0.0042	Reject H_0	This paper concluded that β_3=IR significantly affects LGGDP
β_4=LGSMC	0.9138	Do Not Reject H_0	This paper concluded that β_4=LGSMC insignificantly affects LGGDP
β_5=DCR	0.1726	Do Not Reject H_0	This paper concluded that β_5=DCR insignificantly affects LGGDP
β_6=LGINV	0.0000	Reject H_0	This paper concluded that B_6=LGINV significantly affects LGGDP

Note: LGGDP is known as Japan's Gross Domestic Product; INF is known as Inflation; FDI is known as Foreign Direct Investment; IR is known as Interest Rate; LGSMC is known as Stock Market Capitalization; DCR is known as Domestic Credit Ratio; LGINV is known as Investment Ratio

4.2.7 F-statistic

This paper also used F-test for checking the overall significance of this paper's estimated model (Gujarati & Porter, 2009).

Hypothesis:

H_0: $\beta_1 = \beta 2 = \beta_3 = \ldots \beta i = 0$

H_1: At least one of the β_i is not equal to zero

Where β_i = 1, 2, 3, 4, 5, 6

Critical value: 1% significance level

Decision rule:

Reject H_0, if the P-value of F-statistic is less than 0.01.

Conclusion:

By referring to the economic model stated in the section 4.1, the P-value of F-statistic, which is 0.0000, is less than 0.01, as a result H_0 is rejected. Therefore, this paper has sufficient evidence to conclude that the estimated model is significant in explaining the dependent variable of economic growth.

4.3 Unit Root Test

Next, this paper applied both Augmented Dickey Fuller and Phillips Perron of Unit Root Test to check for the stationarity of those variables as shown in Table 4.3.1. Besides, the stationary of these variables enable this paper to carry out other tests, such as Johansen Co-integration Test, Granger Causality Test and Vector Correction Model.

Table 4.3.1: Unit Root and Stationary Test Result

	Augmented Dickey Fuller (ADF)		Phillips Perron (PP)	
	Level			
Variable	Constant Without Trend	Constant With Trend	Constant Without Trend	Constant With Trend
LGGDP	-1.189300 (1)	-2.340172 (1)	-0.939971 [0]	-2.061578 [1]
INF	-3.046285 (0)	-3.044209 (0)	-3.042369 [3]	-3.046352 [3]
FDI	-4.186364 * (1)	-4.229452 * (1)	-7.878225 * [3]	-7.881383 * [3]
IR	-2.588574 (0)	-2.363654 (1)	-2.529587 [1]	-2.900152 [1]
LGSMC	-2.205830 (4)	-2.557282 (4)	-2.351143 [3]	-2.417547 [3]
DCR	-2.562186 (3)	-3.664640 (3)	-7.559100 * [6]	-8.391541 * [16]
LGINV	-3.107500 (8)	-3.135312 (8)	-5.281538 * [4]	-5.893551 * [5]
	First Different			
LGGDP	-6.378310 * (0)	-6.354086 * (0)	-6.394136 * [2]	-6.345593 * [3]
INF	-8.060965 * (1)	-7.989330 * (1)	-7.045216 * [9]	-6.911170 * [9]

FDI	-15.81509 * (1)	-15.68259 * (1)	-26.65814 * [8]	-26.66724 * [8]
IR	-6.218073 * (1)	-6.220225 * (0)	-9.430097 * [4]	-9.399227 * [4]
LGSMC	-7.192638 * (0)	-7.143542 * (0)	-7.191878 * [2]	-7.143509 * [1]
DCR	-12.20087 * (2)	-12.14083 * (2)	-22.79449 * [13]	-22.47740 * [13]
LGINV	-4.695824 * (1)	-5.033476* (3)	-18.89628 * [17]	-18.04747 [17]
Note: * denotes significant at 1% significance level. The figure in parenthesis (…) represents optimum lag length selected based on Akaike Info Critirion. The figure in bracket […] represents the Bandwidth used in the KPSS test selected based on Newey-West Bandwidth criterion.				

Note: LGGDP is known as Japan's Gross Domestic Product; INF is known as Inflation; FDI is known as Foreign Direct Investment; IR is known as Interest Rate; LGSMC is known as Stock Market Capitalization; DCR is known as Domestic Credit Ratio; LGINV is known as Investment Ratio

Hypothesis:

H_0: LGGDP/ INF/ FDI/ IR/ LGSMC/ DCR/ LGINV is not stationary and has a unit root.

H_1: LGGDP/ INF/ FDI/ IR/ LGSMC/ DCR/ LGINV is stationary and do not contain unit root.

By referring to the Table 4.3.1, both of the ADF and PP test in term of level showed that most of the variables are not stationary and contain unit root, as most of the variables are not significant at 1% significance level. Therefore, the researchers do not have sufficient evidence to reject H_0.

However, this paper proceeded to first difference to carry out both ADF and PP tests. From these tests, the researchers are able to obtain sufficient evidence to reject $H_{0,}$ as all P-value of those variables are less than 0.01. Therefore, all variables are stationary in term of first difference and the estimated model do not contain unit root.

4.4 Johansen Co-integration Test

This paper continued with the co-integration test in order to carry out the objective to test whether there is a long run equilibrium relationship in the estimated model (Johansen & Jeselius, 1990).

Table 4.4.1: Johansen-Jeselius Co-integration Test

Hypothesized No.of CE(s)	Trace Statistic	Max-Eigen Statistic	Critical Values (1%)	
			Trace	Max-Eigen
R=0	174.7166 *	56.52766 *	135.9732	52.30821
R=1	118.1889 *	46.29735 *	104.9615	45.86900
R=2	71.89159	36.50893	77.81884	39.37013
R=3	35.38266	15.90512	54.68150	32.71527
R=4	19.47754	10.47510	35.45817	25.86121
R=5	9.002445	7.722831	19.93711	18.52001
R=6	1.279614	1.279614	6.634897	6.634897

Table 4.4.1 showed the results of co-integration test. Both P-value in Trace and Maximum Eigen at R=0 and R=1 are lower than 1% significance level and rejected H_0.

Hypothesis:

H_0: Long run relationship does not exist between variables

H_1: Long-run relationship exists between variables.

By referring to the Table 4.4.1, the results showed that both Trace statistic and Max-Eigen statistic are co-integrated in R=1 at 1% significance level. Therefore, the researchers have sufficient evidence to reject H_0 and enable this paper to conclude that the estimated model contains a long run relationship between dependent and independent variables.

4.5 Granger Causality Test

Table 4.5.1 Summary of Short-Term Granger Causality Test Results between All Variables Based On VECM

	Independent Variables						
Dependent variable	X^2-statistics of lagged 1st differenced term						
	ΔLGGDP	ΔINF	ΔFDI	ΔIR	ΔLGSMC	ΔDCR	ΔLGINV
ΔLGGDP	--	1.172244 [0.2789]	0.031291 [0.8596]	0.460220 [0.4975]	6.175507 [0.0130]	2.338105 [0.1262]	0.331059 [0.5650]
ΔINF	0.079166 [0.7784]	--	0.149619 [0.6989]	1.566142 [0.2108]	0.040145 [0.8412]	4.290270 [0.0383]	1.166050 [0.2802]
ΔFDI	0.779393 [0.3773]	1.790238 [0.1809]	--	0.002361 [0.9612]	2.485485 [0.1149]	0.025499 [0.8731]	1.252888 [0.2630]
ΔIR	0.410675 [0.5216]	2.752981 [0.0971]	1.012056 [0.3144]	--	0.058910 [0.8082]	0.292734 [0.5885]	0.013840 [0.9063]
ΔLGSMC	0.278075 [0.5980]	6.003564 [0.0143]	2.104792 [0.1468]	0.535066 [0.4645]	--	0.056291 [0.8125]	0.010030 [0.9202]
ΔDCR	6.156465 [0.0131]	**15.68009*** [0.0001]	2.308999 [0.1286]	0.213568 [0.6440]	3.105196 [0.0780]	--	2.317725 [0.1279]
ΔLGINV	0.042576 [0.8365]	8.443704 [0.0037]	1.211634 [0.2710]	0.496971 [0.4808]	0.240269 [0.6240]	**22.30069*** [0.0000]	--

Note: * denotes significant at 1% significance level. The figure in the parenthesis (…) denote as t-statistic and the figure in the squared brackets […] represent as p-value.

Note: LGGDP is known as Japan's Gross Domestic Product; INF is known as Inflation; FDI is known as Foreign Direct Investment; IR is known as Interest Rate; LGSMC is known as Stock Market Capitalization; DCR is known as Domestic Credit Ratio; LGINV is known as Investment Ratio

Figure 3.1: The Relationship between Each Variable for Granger Causality Test

Based on the output, as shown in Table4.5.1, this paper can conclude that there are granger cause between independent variables, which are Inflation (INF) do granger cause toward Domestic Credit Ratio (DCR) and DCR do granger cause Investment Ratio (INV).

4.5.1 Inflation (INF)

Hypothesis:

H_0: LGGDP do not granger caused by INF in short run.

H_1: LGGDP do granger caused by INF in short run.

Decision rule: Reject H_0, if P-value is less than 1% significance level.

Based on the Table 4.5.1, the results showed that Gross Domestic Product (LGGDP) is not granger caused by Inflation (INF) in short run. This is due to

the P-value of INF (0.2789) is greater than 1% significance level, so this paper do not reject H_0. Therefore, INF did not granger cause LGGDP and INF is unable to forecast the trend of LGGDP.

This result is inconsistent with the finding of Mubarik (2005) and Marques et al. (2013), because both researchers found that INF do granger cause the economic growth, which means that inflation can forecast economic growth (GDP). However, the study of Abdullahi et al. (2012) found that INF do not granger cause the economic growth GDP, which is consistent to the finding of this paper.

4.5.2 Foreign Direct Investment (FDI)

Hypothesis:

H_0: LGGDP do not granger caused by FDI in short run.

H_1: LGGDP do granger caused by FDI in short run.

Decision rule: Reject H_0, if P-value is less than 1% significance level.

Based on the Table 4.5.1, the results showed that Gross Domestic Product (LGGDP) do not granger caused by Foreign Direct Investment (FDI) in short run. This is due to P-value of FDI (0.8596) is greater than 1% significance level, so this paper do not reject H_0. Therefore, FDI do not granger cause LGGDP in this paper and FDI is unable to forecast the trend of GDP. This

finding is inconsistent with the study of Baharumshah and Thanoon (2006) in East Asia countries. However, in the study of Anforum et al. (2013) found that there is no granger cause on FDI toward GDP, which is similar to the finding of this paper.

4.5.3 Interest Rate (IR)

Hypothesis:

H_0: LGGDP do not granger caused by IR in short run.

H_1: LGGDP do granger caused by IR in short run.

Decision rule: Reject H_0, if P-value is less than 1% significance level.

Based on the Table 4.5.1, the results showed that Gross Domestic Product (LGGDP) do not granger caused by Interest Rate (IR) in short run. This is due to the P-value of IR (0.4975) is greater than 1% significance level, so this paper do not reject H_0. Therefore, this implied that IR do not granger cause LGGDP and this paper proved that IR cannot be use for forecasting the trend of LGGDP. There are two journals that are found to be consistent to the finding of this paper which are Abdullahi et al. (2012) as well as Kalikeka and Sheefeni (2013).

4.5.4 Stock Market Capitalization (SMC)

Hypothesis:

H_0: LGGDP do not granger caused by LGSMC in short run.

H_1: LGGDP do granger caused by LGSMC in short run.

Decision rule: Reject H_0, if P-value is less than 1% significance level.

Based on the Table 4.5.1, the results showed that Gross Domestic Product (LGGDP) do not granger caused by Stock Market Capitalization (LGSMC) in short run. This is due to P-value of SMC (0.0130) greater than 1% significance level, so this paper do not reject H_0. Therefore it is concluded that SMC do not granger cause LGGDP and SMC is unable to forecast the trend of GDP. The finding of this paper is similar to the finding in the Carp (2012), which the researcher found that there is no granger cause on the economic growth rate.

4.5.5 Domestic Credit Ratio (DCR)

Hypothesis:

H_0: LGGDP do not granger caused by DCR in short run.

H_1: LGGDP do granger caused by DCR in short run.

Decision rule: Reject H_0, if P-value is less than 1% significance level.

Based on the Table 4.5.1, the results showed that Gross Domestic Product (LGGDP) do not granger caused by Domestic Credit Ratio (DCR) in short run. This is due to the P-value of DCR (0.1262) is greater than 1% significance level, so this paper do not reject H_0. Therefore, this point out that DCR do not granger causes LGGDP and DCR is unable to forecast the trend of GDP. The finding of this paper is also supported by the Ogbonna et al. (2013), as the researchers also found that there is no granger cause on domestic credit ratio towards economic growth.

4.5.6 Investment Ratio (INV)

Hypothesis:

H_0: LGGDP do not granger caused by LGINV in short run.

H_1: LGGDP do granger cause LGINV in short run.

Decision rule: Reject H_0, if P-value is less than 1% significance level.

Based on the Table 4.5.1, the results indicated that Gross Domestic Product (LGGDP) do not granger caused by Investment Ratio (LGINV) in short run. This is due to P-value of INV (0.5650) greater than 1% significance level, so this paper do not reject H_0. Therefore, this showed that INV do not granger cause LGGDP and INV cannot use to forecast the trend LGGDP. The study of Marques et al. (2013) has obtained the same conclusion as this paper, because the researchers also found that there is no granger cause between investment ratio and economic growth (GDP).

4.6 Variance Decomposition Test

Table 4.6.1: Variance Decomposition of LGGDP towards INF, FDI, IR, LGSMC, DCR and LGINV

Variance Decomposition of LGGDP								
Period	Standard Error	LGGDP	INF	FDI	IR	LGSMC	DCR	LGINV
1	0.009699	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.015891	91.14021	3.092722	0.030515	0.038815	4.066584	**0.002549**	1.628608
3	0.020729	89.13872	2.147855	0.084395	0.025451	6.628393	0.107446	1.867745
4	0.024697	88.04322	1.641156	0.101944	0.072668	7.920062	0.214092	2.006862
5	0.028023	87.49099	1.409905	0.111082	0.101620	8.587239	0.259879	2.039280
6	0.030988	87.13663	1.280660	0.114667	0.114888	9.010578	0.276318	2.066262
7	0.033706	86.89539	1.179959	0.119077	0.122598	9.302500	0.291620	2.088853
8	0.036220	86.71894	1.104645	0.121602	0.129497	9.515811	0.304707	2.104801
9	0.038567	86.58498	1.049563	0.123729	0.134892	9.677375	0.313591	2.115866
10	0.040779	86.47881	1.006242	0.125214	0.138820	**9.805661**	0.320349	2.124903

Table 4.6.2 The Impact of the Independent Variables toward GDP in Short Run and Long Run

Small impact in short run	Domestic Credit Ratio (DCR)
Large impact in long run	Stock Market Capitalization (LGSMC)

Hypothesis:

H_0: INF/ FDI/ IR/ LGSMC/ DCR/ LGINV do not has an impact on economic growth (LGGDP)

H_1: INF/ FDI/ IR/ LGSMC/ DCR/ LGINV has an impact on economic growth (LGGDP)

Note: LGGDP is known as Japan's Gross Domestic Product; INF is known as Inflation; FDI is known as Foreign Direct Investment; IR is known as Interest Rate; LGSMC is known as Stock Market Capitalization; DCR is known as Domestic Credit Ratio; LGINV is known as Investment Ratio

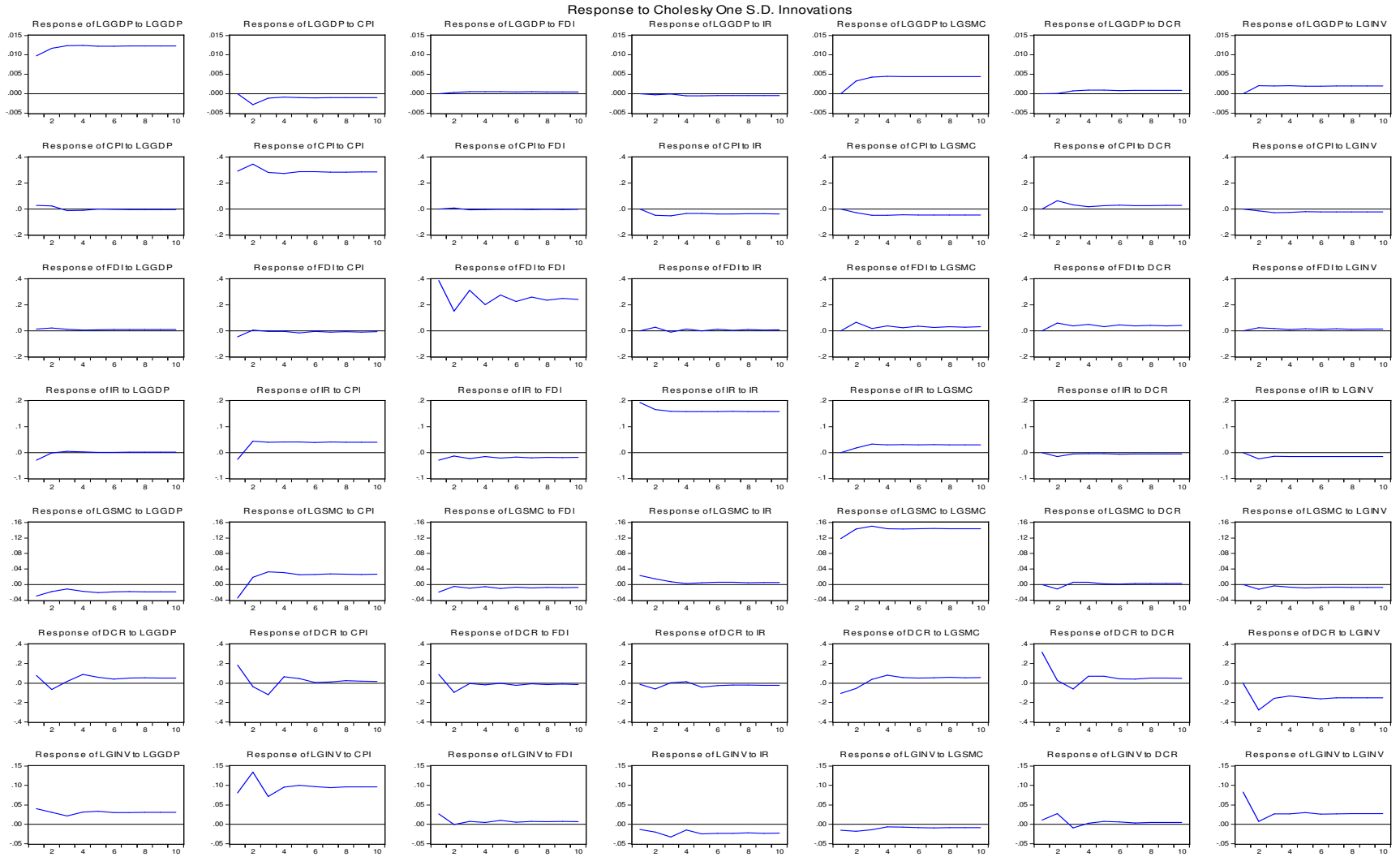
Due to innovative shocks stemming, so variance decomposition is conducted for determining the proportional contribution in one variable (Pesaran & Shin, 1998). The objective of this test is to find out the movement in the dependent variable (LGGDP), which can be caused by "own" shocks, versus shocks to the other variables. From the table above, the Stock Market Capitalization (LGSMC) created the largest impact of 9.805661% toward Gross Domestic Product (LGGDP) in period 10. On the other hand, there is only a small proportion of impact in T-bill Interest Rate (IR) toward LGGDP, as it has only 0.002549% of shock in period 2.

In addition, from the Table 4.6.1, it showed that when the period increases and the impact of independent toward economic growth becomes larger. In short, those independent variables have a larger impact toward dependent variable in long run.

The results showed that Domestic Credit Ratio (DCR) has small impact toward GDP in short run. The result of this paper is consistent with the result of Variance Decomposition Test that previously did by Marques et al. (2013) which concluded that the DCR has small impact in short run towards GDP on the second quarter.

The stock market development had large impact in long run toward the GDP is supported by the finding of Levine and Zervos (1996) mentioned that SMC is highly correlated with economic growth in long run. It is confirmed again by Levine (1996) as well as Agrawalla and Tuteja (2007) saying that stock market provide services to non-financial economy that is important to the long term economic development.

4.7 Impulse Response Function



4.8 Conclusion

In order to give a clear and precise explanation of data analysis results for readers, this paper has simplified all the findings and outputs of this paper's estimated model into tables and figures. Besides, this paper provided some appropriate explanation based on the previous studies. In next chapter, this paper summarized the result from every test and listed out some limitations as well as provided some importance suggestions for future studies.

Chapter 5: Discussion, Conclusion and Implications

5.0 Introduction

In order to obtain a clear presentation and explanation on the estimated model's results from Chapter 4, this paper summarized those results into a few tables and discuss at here. Moreover, this paper checked on the consistency of expected sign and theories with the major findings. Besides, insights and implications for Japan's policy makers, limitations as well as recommendations for future researchers and conclusion are written accordingly.

5.1 Summary of Statistical Analyses

Table 5.1: Statistical Analyses' Summaries

Econometric problems	Description
Multicollinearity	No multicollinearity problem
Autocorrelation	No autocorrelation problem
Heteroscedasticity	No heteroscedasticity problem
Model Specification	Model is correctly specified
Normality	Error term is normally distributed
F-Test	Model is significant in explaining the dependent variable

Description: The estimated model did not contain any econometric problem, as it passed through all diagnostic checking tests.

For multicollinearity, all correlation between independent variables in the pair-wise analysis are lower than 0.8 and all the variable inflation factor results are between 0 to 10, so there is no multicollinearity problem.

For autocorrelation, the P-value of F-statistic in LM test 0.0206 is greater than 1 % significance level, so H_0 is not rejected and it is concluded that there is no autocorrelation problem. For heteroscedasticity, the P-value of F-statistic in ARCH test is 0.5510, which is greater than 1% significance level, so H_0 is not rejected and it is concluded that there is no heteroscedasticity problem.

For model specification, the P-value of F-statistic in Ramsey RESET test is 0.0413, which is greater than 1% significance level, so H_0 is not rejected and it is concluded that the model is correctly specified.

For normality test, the P-value of F-statistic 0.018964 in Jarque-Bera normality test is greater than 1% significance level, so H_0 is not rejected and it is concluded that the error term is normally distributed.

For F-test, the P-value of F-statistic 0.0000 is lower than 1% significance level, so H_0 is rejected and it is concluded that at least one independent variable is significant to explain economic growth.

Table 5.2: Summaries of Major Findings

Dependent Variable	Independent Variable	Ordinary Least Square	Unit Root Test	Granger Causality Test	Variance Decomposition
LGGDP	Inflation (INF)	Significant at 1% significance level (negative)	Stationary	-	-
LGGDP	Foreign Direct Investment (FDI)	Not significant at 1% significance level (negative)	Stationary	-	-
LGGDP	Interest Rate (IR)	Significant at 1% significance level (positive)	Stationary	-	-

LGGDP	Stock Market Capitalization (LGSMC)	Not significant at 1% significance level (positive)	Stationary	-	Large impact in long run
LGGDP	Domestic Credit Ratio (DCR)	Not significant at 1% significance level (negative)	Stationary	-	Small impact in short run
LGGDP	LGINV	Significant at 1% significance level (positive)	Stationary	-	

Description: The table above showed that INF, IR, and LGINV have relationship with dependent variable at 1% significance level. However, the table also shown that FDI, LGSMC and DCR have no relationship with the dependent variable at 1% significance level.

On the other hand, the table also showed IR, LGSMC and LGINV have positive relationship with LGGDP whereas, INF, FDI and DCR have an inverse relationship with LGGDP. The model did not contain unit root, as all independent variables are stationary.

Based on the Granger Causality results, no short run relationship is found between independent variable and dependent variable. Moreover, DCR has small impact towards LGGDP in short run. However, LGSMC has large impact towards LGGDP in long run.

Table 5.3: Consistency of Result with Theories Reviewed

Independent Variable	**Relevant Theoretical Model**			
	Fisher Effect Theory	**Endogenous Growth Theory**	**Keynesian Economic Theory**	**Schumpeter Theory of Economic Growth**
Inflation	Inconsistent	N/A	Consistent	N/A
Foreign Direct Investment	N/A	Inconsistent	N/A	N/A
Interest Rate	Inconsistent	N/A	N/A	N/A
Stock Market Capitalization	N/A	Consistent	N/A	N/A
Domestic Credit Ratio	N/A	N/A	N/A	Inconsistent
Investment Ratio	N/A	N/A	Consistent	N/A

Table 5.4: Consistency of Result with Expected Sign

Independent Variable	**Expected Sign**	**Actual Sign**	**Consistency**
Inflation	Negative	Negative	Consistent
Foreign Direct Investment	Positive	Negative	Inconsistent
Interest Rate	Positive	Positive	Consistent
Stock Market Capitalization	Positive	Positive	Inconsistent*
Domestic Credit Ratio	Negative	Negative	Inconsistent*
Investment Ratio	Positive	Positive	Consistent

Notes: * Since the independent variables are insignificant in explaining economic growth, so the expected sign of those variables are inconsistent with the actual sign.

Table 5.5: Johansen- Juselius Co-integration Test

Hypothesized No. of CE(s)	Trace Statistic	Max-Eigen Statistic
R=0	174.7166 *	56.52766 *
R=1	118.1889 *	46.29735 *
R=2	71.89159	36.50893
R=3	35.38266	15.90512
R=4	19.47754	10.47510
R=5	9.002445	7.722831
R=6	1.279614	1.279614

Notes: *Rejection of the hypothesis at the 1% significance level

Description: The results showed that Trace Test is a co-integrated where r=0,1 and Max-Eigen Test is a co-integrated where r=0,1 both at 1% significance level. Thus, this test concluded that long run relationship exist between variables.

5.2 Discussions on Major Findings

5.2.1 Inflation (INF)

This paper found that inflation is significant at 1% of significance level and it is negatively affect the economic growth in Japan. This implied that inflation is significant in influencing Japan's economic growth and has negative impact towards the economic growth in Japan. It is consistent to the expected sign and also Keynesian Economics Theory. However, it is inconsistent with Fisher Effect Theory.

Inflation is one of the core independent variables to explain economic growth, as this also proved by the study of Bittencourt (2012). The study concluded that inflation is a main macroeconomic determinant of growth and has a negative impact on growth. One of the reasons how inflation negatively impacts economic growth was mentioned in the findings of Bengoa and Sanchez-Robles (2003), stating that inflation jeopardizes competitiveness, thus decreasing the economic growth.

The finding of this research paper saying that the inflation is negatively influence the Japan's economic growth is aligned with the Keynesian Economics Theory which suggested increase in Aggregate Demand (AD) will subsequently lead to economic growth.

The AD model posited that there are several factors affecting economic growth which are consumption, investment, government spending or export. Inflation might have direct influence towards consumption and export. With higher inflation, the local goods become more expensive, which cause both consumption and export decrease and thus lead to decrease in economic growth. This is similar to the result found in this paper.

On the other hand, the results are inconsistent with Fisher Effect Theory which proposed that inflation rate moved together at the same amount with interest rate. Therefore, central bank should concern in both inflation and interest rate to control on money supply in order to manipulate the economic growth. However, in this paper inflation and interest rate do not move together in the same way, thus, not consistent with the theory.

5.2.2 Foreign Direct Investment (FDI)

This paper found that the Foreign Direct Investment (FDI) is not significant at 1% significance level and it is negatively affects the economic growth in Japan. This implied that FDI is not significant in influencing Japan's economic growth. The finding in this paper is not consistent with the expected sign and also Endogenous Growth Theory.

Result of FDI is inconsistent with the Endogenous Growth Theory might due to the following reason. According to Falki (2009), in order for effect of FDI to fully reflect on economic growth, the country should have a developed local markets and institutions, investment friendly policy and administrative

framework also the availability of complementary factors of production. Lack of fulfilment of the conditions above might seriously limited the effects of FDI towards economic growth. Moreover, the research also mentioned that the increase in the export and involvement in industrial sector or large scale manufacturing sector might enhance the effect of FDI towards economic growth. The insignificant of FDI in explaining economic growth in Japan might due to weak institutions or insufficient endowment of complementary factors of production.

The reason behind that FDI is adversely affect the economic growth is due to the increase of the tendency of local businesses to lay off local workers by crowding out local businesses that cannot compete with multinational company. At the same time, the negative effect of FDI towards economic growth is more obvious if investors use cheap raw material in local and resell the finished product at a higher price level (Zilinske, 2010). Moreover, FDI might have direct negative effect toward economic growth when a country has a very low level of human capital (Borensztein, Gregorio, & Lee, 1998).

This paper included FDI in the estimated model because in the research of Barrios, Gorg, and Strobl (2005), it is found that FDI is an important independent variable, it represents capital inflow that has positive effect on intermediate product sector to expand production. Ericsson and Irandoust (2001) stated that FDI has a major influence on economic growth.

5.2.3 Interest Rate (IR)

This paper found that the interest rate is significant at 1% significance level and it is positively affect the economic growth in Japan. This implied that interest rate is significantly in influencing Japan's economic growth and has a positive impact toward the economic growth in Japan. The finding in this paper is consistent with the expected sign but not consistent with Fisher Effect Theory.

To add, Chang and Huang (2010) also found that higher interest rate will bring the banking system to have positively and significantly effects the economic growth. Chang and Huang (2010) study's findings sided with Pill (1997), in which they found that East Asia enjoy a healthier growth performance than it is implied by the simple reduced form relationship between the interest rate and economic growth.

The reason interest rate in Japan has a positive relationship with its economic growth is because Japan government provides higher T-bill rate. Consequently, the market interest rate of the other securities will go up as investor will not invest at lower than the Treasury-bill interest rate. As the market interest rate increase, investor find that it is attractive to invest in Japan, then the capital available for expansion of Japan will increase and this lead to increase in productivity and economic growth. Other than that, the increase in interest rate encouraged savers to save thereby inducing growth in the economy (Udoka & Roland, 2012). Nissim and Penman (2001) also mentioned that increase in interest rate is followed by higher profitability and economic growth.

On the other hand, the result is inconsistent with Fisher Effect Theory which proposed that interest rate is moving together at the same amount with inflation rate. Therefore, central bank should always concern on both interest and inflation rate of money supply in order to manipulate the economic growth. However, in this paper, inflation and interest rate are not move together in the same way, thus, not consistent with theory.

5.2.4 Stock Market Capitalization (SMC)

This paper found that the Stock Market Capitalization (SMC) is not significant at 1% significance level and it is positively affect the economic growth in Japan. This implied that SMC is not significant in influencing Japan's economic growth. Since this independent variable is insignificant in explaining Japan's economic growth, then the expected sign is not consistent with this paper results. However, it is consistent with the Endogenous Growth Theory.

The stock market is a platform to boost up the economic growth in which it promotes efficiency in capital formation and allocation by enable the government and businesses to raise long-term capital for financing new projects, expanding and improve the commercial concerns. Fund must be effectively allocated and mobilized in order for the economy to control their resources, for example, material, human and management resources to improve the economic growth (Osinubi, 1998). Thus, it is consistent with Endogenous Growth Theory.

The reason for SMC being insignificant can be attributed to the small and mid-sized capitalization in stock market. The small and mid-sized capitalizations cannot increase the potentiality of a company to grow. On the other hand, the large cap corporations are most likely market lenders, hence having minimal space to grow thus discouraging economic growth if such capitalization is pervasive throughout Japan (Amadeo, 2012).

The reason that SMC is important is because Cooray (2010) found that SMC to be positive and highly significant. In the research, SMC is said to be a vital independent variable. This finding was aligned with and in concordance to the findings of Atje and Javanovic (1993), Bencivenga, Smith, and Starr (1996), Levine and Zervos (1998), Rousseau and Wachtel (2000) as well as Henry (2003).

5.2.5 Domestic Credit Ratio (DCR)

This paper found that Domestic Credit Ratio (DCR) is not significant at 1% significance level and it is negatively affect the economic growth in Japan. This implied that DCR is not significant in influencing Japan's economic growth. This paper is not consistent with the expected sign, as it is insignificant in explaining Japan's economic growth. Moreover, DCR is also not consistent with the Schumpeter Theory of Economic Development.

In the results of the journal written by Egert, Backe, and Zumer (2007), they stated that DCR and economic growth has significantly inverse relationship with each other. This is supported by the finding of Marques et al. (2013),

stating that there is a negative relationship between DCR and economic growth. In a similar manner, Saci, Giorgioni, and Holden (2009) had a significantly negative expected sign in their results. This is also aligned with Aamir, Sharif, and Nisar (2011). The negative relationship between DCR and economic growth is because the economy is always intolerance to high domestic debt as it throws the stable state of economy out of balance (Ozkaya, 2013). Countries with alarming economy condition are susceptible to high domestic debt, the detrimental DCR pose substantial threat to federal finances, high DCR increase the potentiality of plunging an economy into turmoil, if not crisis, hence impeding economic growth.

DCR's insignificant effect on economic growth can be analogized with Kenya's similar situation. This is due to the formidable financial development of Kenya from 1996 to 2007 (Maana, Owino & Mutai, 2008). Japan's DCR insignificantly explained economic growth because of its liable financial development, export earnings, and income is strong. This magnitude of development manifested in the outweighing of credit build up, thus minimizing DCR's significance towards economic growth in Japan. Furthermore, this paper did not exclude this insignificant variable, because it is an important independent variable that used to explained economic growth (Aamir, Sharif, & Nisar, 2011).

The reason that the results is inconsistent with Schumpeter Theory of Economic Development may due to there is a lot of drawbacks of this theory. One of the limitations is that the supply and demand curves of loans are homogenous, and the supply behaviour of capitalists does not meet the criteria of efficiency (Messori, 1996). There are many criticisms on this theory saying the insights provided is not reliable, therefore the results in this paper is inconsistent with the theory. This theory mentioned that an increase in

domestic credit will help entrepreneurs to create more innovation products and increase the productivity, which can enhance economic growth. However, this paper results has negative relationship with Japan's economic growth instead of positive.

5.2.6 Investment Ratio (INV)

This paper found that investment ratio is significant at 1% significance level and it is positively affect the economic growth in Japan. This implied that investment ratio is significant in influencing Japan's economic growth and has positive impact toward the economic growth in Japan. The finding in this paper is consistent with expected sign and Keynesian Economics Theory.

Vinayagathason (2013) affirmed that investment ratio can stimulate a country's economic growth. The findings of Bittencourt (2012) agreed with Vinayagathason (2013). Bittencourt (2012) included that investment ratio as one of the controls variable in their estimated model. In addition, it is one of the significant variable that has a positive impact on growth. The researchers' findings are in accordance with the initial expectation. Moreover, it was confirmed by Marques et al. (2013) as well as Ouyang and Fu (2012).

The study is consistent with Keynesian Economics Theory, it mentioned that investment is an important variable in explaining the economic growth. AD model under Keynesian Economic Theory mentioned that increased in Aggregate Demand (AD) will subsequently lead to economic growth. At the same time, investment is one of the variables that included in the model. As a

result, increased in investment will lead to increase in AD and ultimately cause economic growth to increase.

5.3 Implications of the Study

The results of this paper have presented important information to public, economists, stock market investors and policy makers. Hereby they played the roles in providing guidance and reference for decision makings. It is important to determine which of the macroeconomic factors, financial development variable and stock market variables would bring impact on economic growth in Japan.

There are a few implications that this paper would like to suggest for Japan's policy makers to strengthen and continue growing in their economic. Currently, Bank of Japan continues with implementing expansionary monetary policy in the country (Kashyap, 2014; Swagel, 2013). When the Japan's central bank implements this monetary policy, they should always aware on both inflation rate and interest rate. As both moving in opposite direction and both rates are not moving in the same trend as suggested in Fisher Effect theory. As a result, when Japan's central bank lowers down the interest rate to reduce the number of investment in Japanese bonds including Treasury bill, Japan's central bank also need to concern about the increase of their country inflation rate. As inflation might have unfavourable impact toward the country's export, so this paper suggested that it is better for Japan to maintain their country inflation rate that does not more than the threshold level of 5.43%, which was the level that mentioned in the research of Vinayagathasan (2013).

Lastly, it is important to achieve a high level of Gross Fixed Capital Formation (GFCF), as the high level of GFCF indicates that there are enough capital resources and human resource in producing more goods and services. With the increase in producing goods, Japan output will be raised up and this will be able to maintain the stability of Japan's economic growth. Based on Keynesian Macroeconomic Theory and the research of Tobin (1972), it is stated that expansion of aggregate demand will lead to full employment whereby there will be maximum of aggregate supply from the labor force to an extend where there will be no increase in employments and output. So, increase of aggregate demand undeniably promotes the economic growth.

5.4 Limitations of the Study

There are always containing limitations and difficulties in every research. This paper major problem is the limited data from UTAR library DataStream. The data constraint in the variable of Stock Market Capitalization (SMC) has prevented this paper to include the variable into the estimated model. This is because the data are only available in annually, which is from year 1988 to 2012 from the DataStream in UTAR library. However, this paper tried out the full effort to convert the SMC from annually to quarterly by following the method that used by Marques, Fuinhas and Marques (2013).

First, compute a factor (R) relating the two variables:

$$R = \frac{\sum_{T=1}^{N} TOPIXQUATEt}{\sum_{T=1}^{n} TOPIXCAPt}$$

Where $TOPIXQuate_t$ and $TOPIXCAP_t$ are the TOPIX stock quote and market capitalization respectively.

S_t= $TOPIXQuate_t$ / R

Using these two formulae, this paper is capable to compute the annually stock market capitalization into quarterly data.

It was later converted into quarterly data; this paper faced another problem of the necessity of observation to be reduced from 133 to 100. This is because the stock market capitalization only contains the data from 1988Q1 to 2012Q4 instead of 1980Q1 to 2013Q1.

Although this paper facing the availability of data for some variables such as domestic credit ratio, foreign direct investment and stock market capitalization, this paper still included those variables into the estimated model. Due to, the exclusion of those importance independent variables might leading to heteroscedasticity in the model. The consequences of including all variables is this paper facing in the decreasing in the number of observation again, because the domestic credit ratio is only available on the period 1998Q1 to 2012Q4. Due to the tolerance and meet the number of data available for domestic credit ratio, this paper once again reduces the number of observation from 100 to 60.

The difficulty of getting enough journals also created another problem for this paper. As some of the journals from those databases that brought by UTAR is not fully free of charge. The purchases of some journals are required in order to embellish this paper. However, UTAR provided an advantage of helping us to get those journals as long as we provide the title of the journal to library reference desk. Nevertheless, this process is time consuming in the course of the final year project, thus lowering the efficiency in the completion of this paper. this paper also utilized alternative sources for journals as well. Namely, the Wiley Online Library and JSTOR, but most of the

articles provided by these sources are not costless as well, especially those with titles that imply high relevancies.

This paper only investigated Japan. Therefore other countries like United States, Malaysia, Thailand and others will not be able to apply Japan's case in their respective country's policy. As a result, the output and information provided from this paper only useful for Japan's government, policy makers and its investors.

5.5 Recommendations for Future Research

Furthermore, time series data is used by researchers in this paper, whereby the results are only applicable in Japan and might not be applicable for other countries in any form of comparison. Besides, this paper comprised data with low sample size causes the results might inefficient and unreliable. Therefore, this paper suggested future researchers to not only rely on DataStream, and should try other databases to find more historical data for increase the number of observations.

Thus, future researchers, no matter the subject matter, are advised to use panel data instead of using time-series data as panel data uses more than one subject, in this case, more than one country, thus increasing the potentiality of the result in providing the researchers more implications and insights, ultimately creating more benefits for the beneficiaries. Moreover, future researchers are encouraged to increase the sample size of data in the panel data by extending the period of study in order to ensure the reliability and efficiency of future studies.

5.6 Conclusion

This paper results showed that Inflation (INF), Interest Rate (IR) and Investment Ratio (INV) are significantly affecting Japan's economic growth whereby INF has an inverse relationship with economic growth and IR as well as INV are positively correlated with economic growth. Besides, Foreign Direct Investment (FDI), Domestic Credit Ratio (DCR) and Stock Market Capitalization (SMC) are insignificantly affecting Japan's economic growth.

Tests are conducted to determine the short run and long run impact of the independent variables toward Economic Growth. It is found that the DCR has small impact in the short run, whereas SMC is has large impact in the long run, which is dichotomous compared to DCR.

This paper's limitations and recommendations are reviewed and discussed to better benefit future researchers. As this paper's contributions on some factors that affected economic growth are exclusively for Japan, but not for other countries around the world to benefit on it. Therefore, this paper has given a suggestion for future study to remedy it by using panel data that includes more than one subject. The problem of reduced observation is suggested with a solution advocated with using other sources rather than only depend on data-stream to collected history data for the extension of the period of study in hope to increase the reliability of future studies. The main objective of this paper is achieved doggedly after all the investigations being carried out.

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