

**The Pattern of Growth in Indonesia after the Economic Crisis 1997/1998:
Does the Primary Sector Still Need to Support Economic Growth?**

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ABSTRACT

This paper aims to examine the pattern of growth in Indonesia, especially after the economic crisis 1997/1998. Indonesia suffered a catastrophic economic crisis from the year 1997 until 1999 and the economy improved from the year 2000 even though it was still dependant on the non-economic fundamental factor. This paper represents the progress of each of the main sectors in the economy, such as primary, secondary, and tertiary sectors, from the year 2001 until 2007, particularly focusing on its role to support economic growth. The primary sector, which consists mostly of agriculture and mining, is always excluded by policy makers because of its decreasing contribution to the Gross Domestic Product (GDP). The interesting phenomenon that we can learn from this paper is the two-way correlation, which happens between primary sector growth and GDP growth, it also happens to the secondary sector. On the other hand, tertiary sector growth has only one-way correlation with GDP growth.

Keywords: Primary Sector, Secondary Sector, Tertiary Sector, Economic Growth,
Correlation

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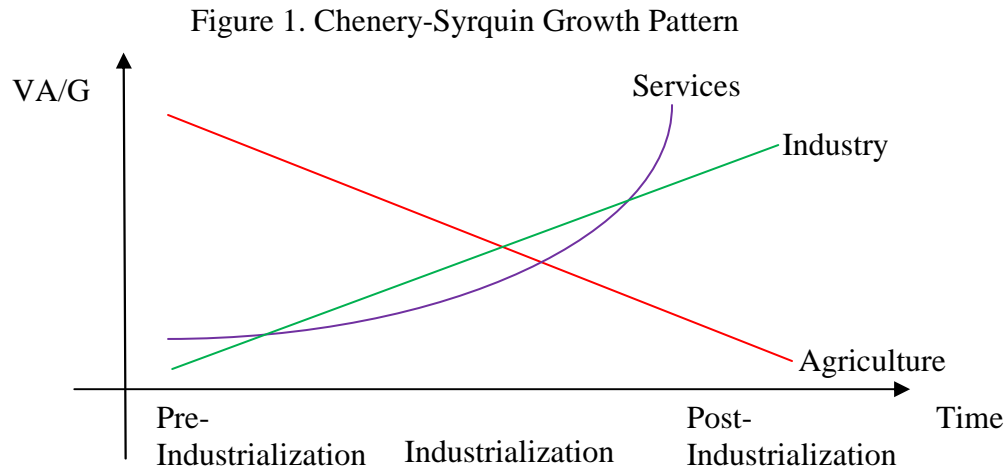
1. INTRODUCTION

1.1. Background

Many development theories have been introduced by brilliant economists, looking in depth into development theory many economists also explained the growth theory as a part of development theory, from Harrod-Domar to Chenery-Syrquin. There are still many economists who have concerns about the development and growth theory, such as Rosenstein-Rodan, Hirschman, Rostow, and many others.

Development is a process of change, not only implying growth or even decline, that entails the possibility of having changes in the social structure, technology, power relations, and distribution of interests (Grando, 2008). Harrod-Domar with their long run development formula also defined the development as an addition between growth and change (Kuntjoro-Jakti, 2007). Development can be political, economic, socio-cultural, or technological. Meanwhile, change can be defined as a vertical, horizontal, or lateral mobility. Nevertheless, this paper only looks in depth at the matter of growth.

Chenery and Syrquin (1975) introduced their invention, which was called “Chenery-Syrquin Growth Pattern.” It focuses on three main sectors that have influenced the economy: agriculture, industry, and services. They observed and measured the value added of each sector to GDP in three different periods: pre-industrialization, industrialization, and post-industrialization (see Figure 1).



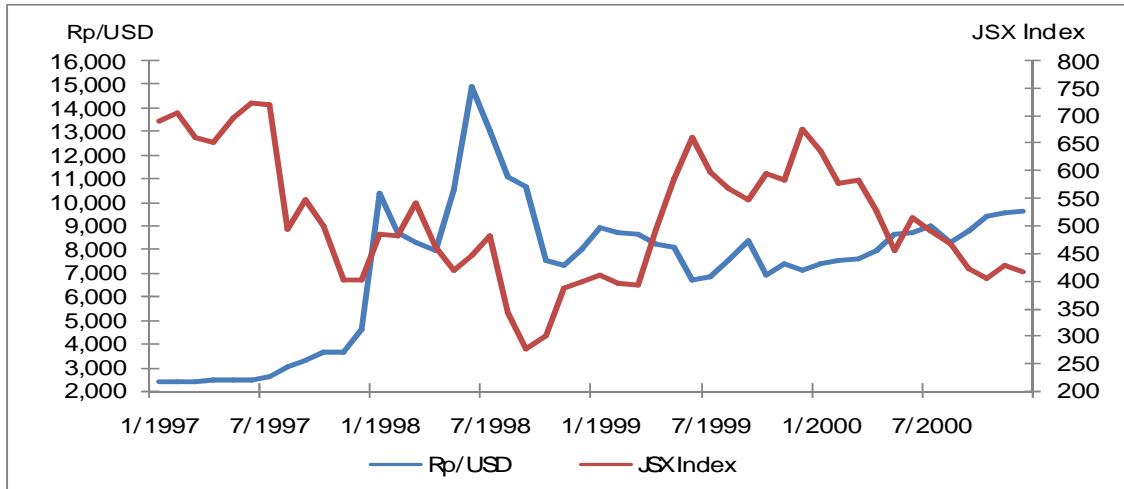
Source: Chenery and Syrquin, 1975

Based on the figure above, we can make a hypothesis for doing research in the pattern of growth field, specifically in one country without considering the economic system applied in the country. The primary sector can be used to present agriculture because it is derived from the primary sector. Meanwhile, industry and services sectors can be presented by the secondary and tertiary sectors.

1.2. Indonesia's Economic Condition: Overview

In the second half of 1997, Indonesia was suffering the East Asian Financial Crisis. The crisis that began from the high depreciation of Thailand's currency (Baht) to USD which then contaminated Indonesia and some other East Asian countries (Hirawan, 2007b). Beginning in August 1997, Indonesia experienced a huge depreciation in its currency (Rupiah), from Rp 2,300 to Rp 15,000 / USD by mid 1998 (see Figure 2). The stock market also suffered high pressure. It was expressed by the decline of the Jakarta Composite Index (JSX) at the end of 1998. This condition happened because of a massive capital outflow from Indonesia to other convincing countries.

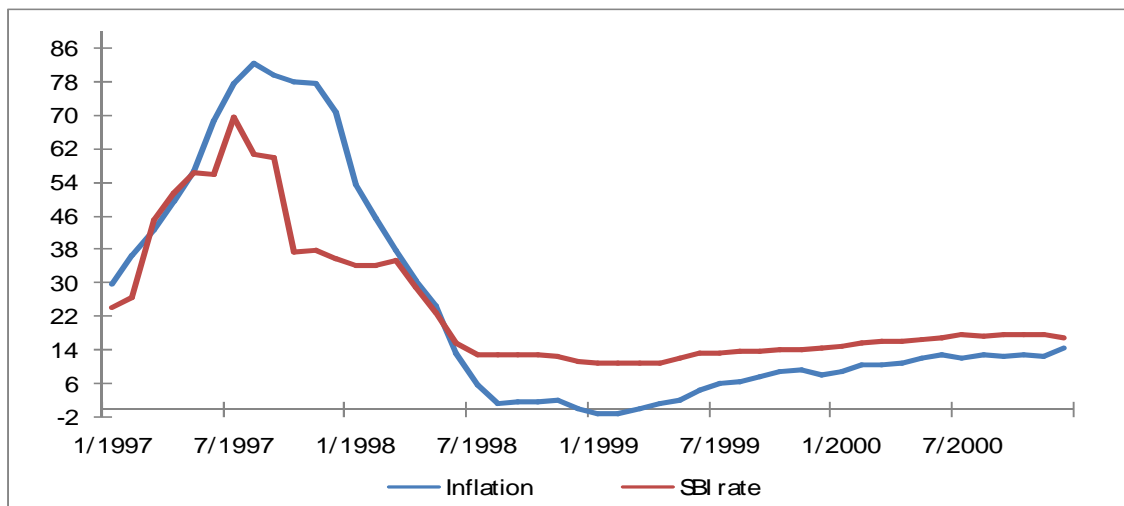
Figure 2. The Exchange Rate (Rp / USD) and JSX Index 1997-2000



Source: CEIC Asia database

Furthermore, the inflation rate was so high in mid 1997. It was about 82 percent (year on year (y-o-y)). In order to respond to the uncontrolled inflation, Bank Indonesia (BI), Indonesia's Central Bank, increased the interest rate (SBI rate). In mid 1997, the interest rate rose significantly to around 60-70 percent (see Figure 3). Consequently, the high interest rate was attracting people to invest their money in the form of bank's high interest fixed short term deposits (1-3 months) rather than to keep their money in hand.

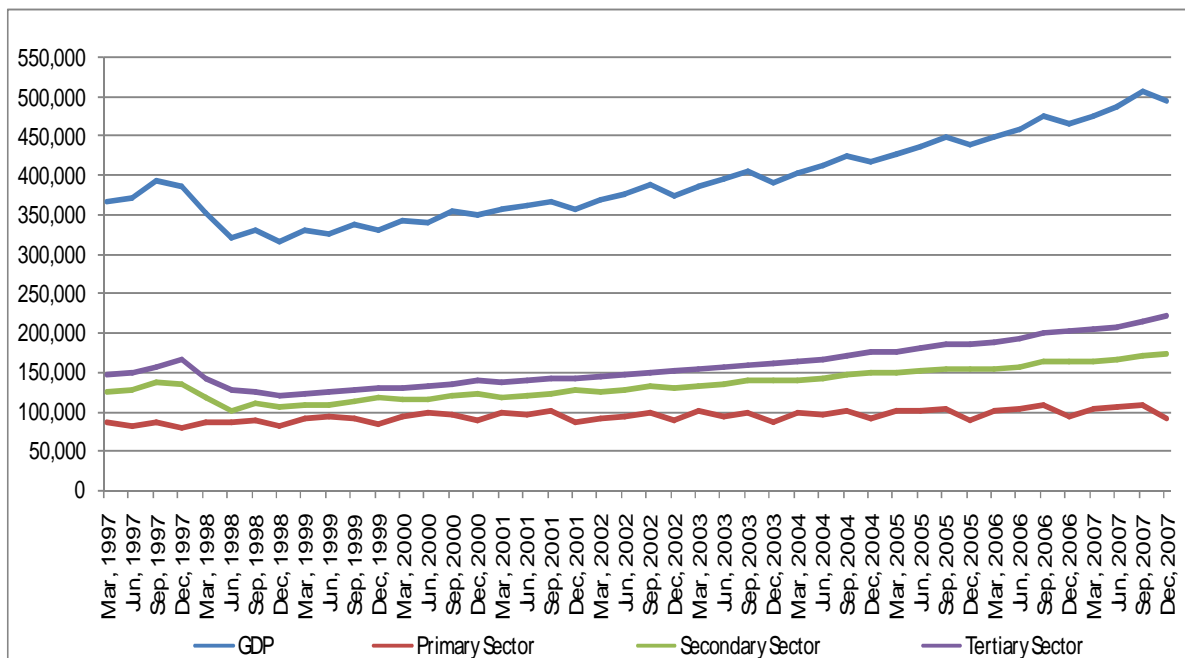
Figure 3. The Inflation Rate (y-o-y) and SBI rate 1997-2000 (in percent)



Source: Bank Indonesia (BI)

The most eye-catching indicator to give evidence of Indonesia's economy falling is GDP. Indonesia's GDP has gradually declined from Rp 392.65 trillion in September 1997 to the lowest level Rp 315 trillion in December 1998. It was automatically followed by all the main sectors. The unique condition happened in the range between December 1997 and March 1998. The secondary and tertiary sectors were declining, but in contrast, the primary sector was increasing (see Figure 4).

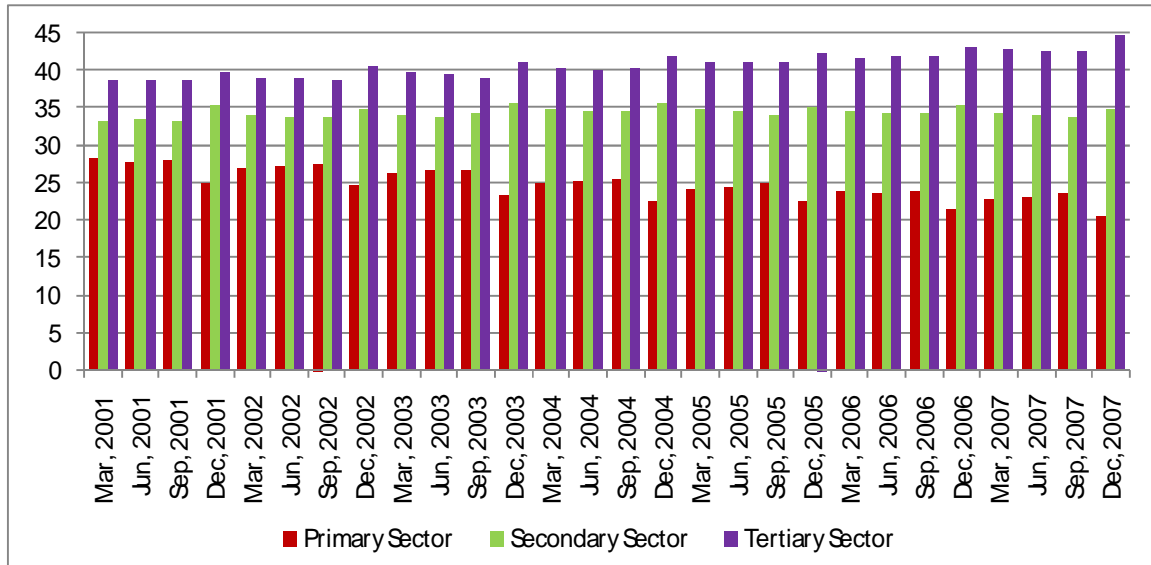
Figure 4. GDP and the Main Sectors in the Economy 1997-2007 (in billions Rupiah)



Source: CEIC Asia database

Economic growth, as a conventional indicator, is still used significantly by policy makers to indicate economic performance. Economic growth, which is depicted by GDP, can give us a preview of macroeconomic conditions as a whole. In Figure 5, we can see the contribution of the main sectors to GDP. The patterns of the contribution of each sector are relatively the same from Q1 2001 until Q4 2007. It was the tertiary sector that gave a big contribution to GDP (more than 35 percent). Meanwhile, the secondary and primary sectors were placed in second and the third position (see Figure 5).

Figure 5. Contribution of Main Sectors to GDP 2001-2007 (in percent)



Source: CEIC Asia database

Based on most of the literature about the economic crisis in Indonesia, it is stated that Indonesia suffered an economic crisis from the year 1997 until mid 1999. In the year 2000, Indonesia's macroeconomic indicators became better, but there were still problems because of the reliance on macroeconomic indicators and non-economic fundamental factors, such as the political and security condition. Based on these conditions, the time frame of this paper will be set from the year 2001 until 2007.

1.3. Objectives

Based on the background knowledge above, this paper attempts to answer the following questions:

1. How is the contribution of the three main sectors in the economy to GDP in Indonesia after the economic crisis 1997/1998?
2. How is the relationship of each sector to the GDP in Indonesia after the economic crisis 1997/1998, especially in order to support economic growth?
3. Which sector has an important role to enhance the economic growth in Indonesia after the economic crisis 1997/1998?

1.4. Research Methods

In this paper, I would like to apply both qualitative and quantitative methods. Many studies have been done on the subject of development and economic growth. A literature survey will be undertaken to enrich the study. Meanwhile, for quantitative, secondary data will be used. This paper uses Indonesia's GDP data, constant price 2000, from the year 2001 until 2007. The data will be quarterly. Since the study will be quantitative, basic statistics and econometrics analysis will be added using *EViews* software.

1.4.1. Correlation Coefficient

Many researchers in social subjects are often interested in how one variable relates to other variables, relationships can be quantified by a single number called the correlation coefficient (r). The number of the correlation coefficient that is always used to measure the relationship between two variables is zero (0) until one (1). If the correlation coefficient is more than 0.8, this shows that there is a strong relationship between two variables and vice versa (Hirawan, 2007a). The formula of Correlation Coefficient as the following:

$$r = \frac{\sum_{i=1}^n (x_i - \bar{X})(y_i - \bar{Y})}{\sqrt{\sum_{i=1}^n (x_i - \bar{X})^2 \sum_{i=1}^n (y_i - \bar{Y})^2}} \quad (1.1)$$

The correlation coefficient is an efficient way to communicate the relationship between two variables. Nevertheless, it doesn't communicate information about whether one variable moves in response to another. The correlation coefficient is only used to identify associations, not causal relationships.

1.4.2. Granger Causality Test

Correlation does not necessarily mean causation. Even regression analysis, which always deals with the dependence of one variable on other variables, also does not imply causation. The econometric output is full of magnificent correlations, which are sometimes spurious. The correlation coefficient does not show a causal relationship, only an association, no further than that.

The Granger (1969) approach to the question of whether X causes Y is to see how much of the current Y can be explained by past values of Y and then to see whether adding lagged values of X can improve the explanation. Y is said to be Granger-caused by X if X helps in the prediction of Y, or equivalently if the coefficients on the lagged X's are statistically significant. Note that two-way causation is frequently the case; X Granger causes Y and Y Granger causes X¹.

It is important to note that the statement “X Granger causes Y” does not imply that Y is the effect or the result of X. Granger causality measures precedence and information content but does not by itself indicate causality in the more common use of the term².

To explain Granger test, let's we consider the relationship between X and Y. The Granger causality test assumes that the information relevant to the prediction of the respective variables, X and Y, is contained solely in the time series data on these variables. The formulation of Granger causality is as the following.

$$Y_t = \sum_{j=1}^m a_j Y_{t-j} + \sum_{j=1}^m b_j X_{t-j} + \varepsilon_t \quad (1.2)$$

$$Y_t = \sum_{j=1}^m c_j X_{t-j} + \sum_{j=1}^m d_j Y_{t-j} + \eta_t \quad (1.3)$$

X_{t-1} and Y_{t-1} are the lag of variable X and Y. t represents time, meanwhile, ε_t and η_t illustrates disturbances which are not correlated.

From the equations above, we can distinguish four cases of Granger causality as the following (Gujarati, 2003):

¹ *Eviews 4 User's Guide*, Quantitative Micro Software, LLC, Irvine CA, 2002, p. 222.

² *Ibid.*

1. Unidirectional causality from X to Y exists if the set of lagged Y coefficients in (1.2) is not statistically different from zero (i.e., $\sum_{j=1}^m a_j = 0$) and the set of the lagged X coefficients in (1.3) is statistically different from zero (i.e., $\sum_{j=1}^m d_j \neq 0$).
2. Unidirectional causality from Y to X is indicated if the estimated coefficients on the lagged Y in (1.2) are statistically different from zero as a group (i.e., $\sum_{j=1}^m a_j \neq 0$) and the set of estimated coefficients on the lagged X in (1.3) is not statistically different from zero (i.e., i.e., $\sum_{j=1}^m d_j = 0$).
3. Feedback, or bilateral causality, is suggested when the sets of Y and X coefficients are statistically significantly different from zero in both regressions
4. Finally, independence is suggested when the sets of Y and X coefficients are not statistically significant in both the regressions.

2. THE CONDITION OF THE MAIN SECTORS AFTER THE ECONOMIC CRISIS 1997/1998

2.1. Primary Sector

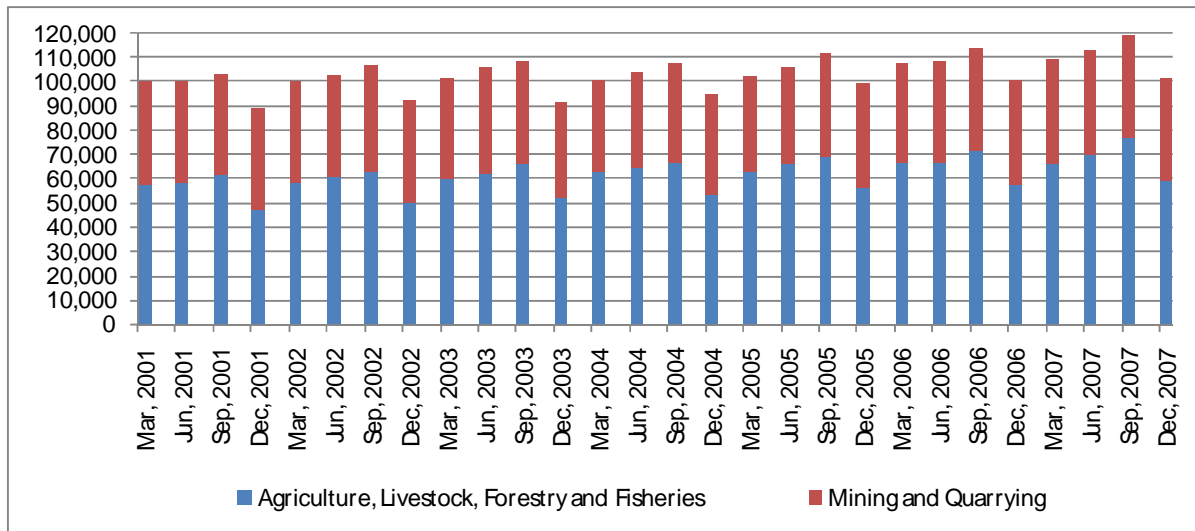
The primary sector, commonly called the natural or resource based sector, is the sector that leads an economy in the period of pre-industrialization. In this period, the primary sector had given a big contribution to the world economy. Based on the Chenery-Syrquin growth pattern, the primary sector tends to decrease in line with the massive growth from the other main sectors, secondary and tertiary, in the industrialization and post-industrialization period.

The classification of the primary sector can be divided into two big sub-sectors. Firstly agriculture, livestock, forestry, and fisheries (ALFF) and the second is mining and quarrying. Agriculture consists of two sub-sectors, farm food crops and non-food crops. Mining is divided into two sub-sectors, which are crude petroleum and natural gas and mining, excluding petroleum and gas.

Figure 6 shows the contribution of the big main sub-sectors, which form the primary sector. As we can see the value of ALFF in GDP from the year 2001-2007 is very

dynamic. The value of this subsector is always higher than Rp 45 trillion. Meanwhile, the value of mining and quarrying is more than Rp 35 trillion. The total value of GDP, specifically in the primary sector, is worth more than Rp 85 trillion from the year 2001-2007.

Figure 6. Primary Sector 2001-2007 (in billions Rupiah)



Source: CEIC Asia database

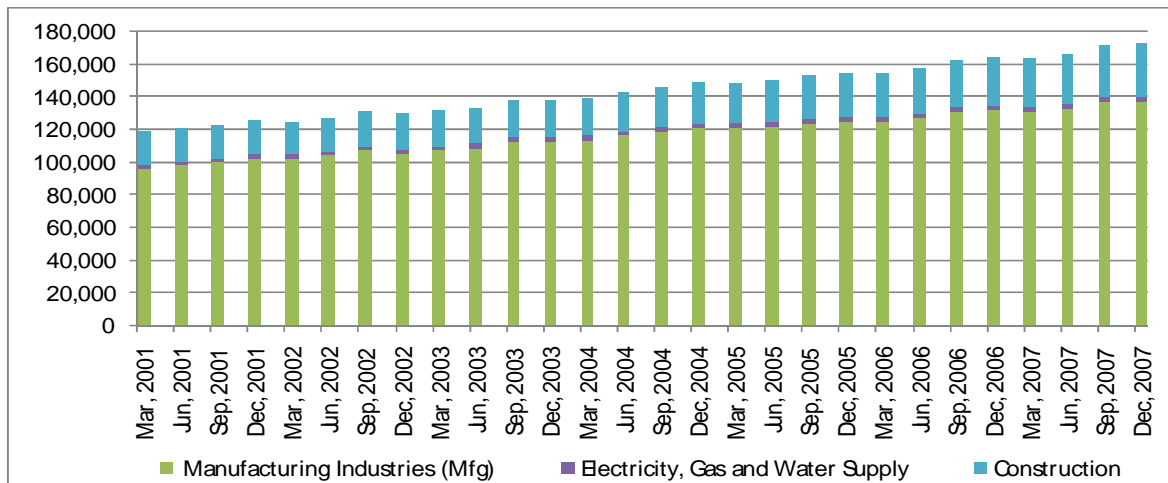
2.2. Secondary Sector

The processing sector is exactly the correct phrase to depict the secondary sector. This sector consists of three big sub-sectors, manufacturing industry, construction, and utilities (Kuntjoro-Jakti, 2007). The manufacturing industry can be classified into two sub-sectors, petroleum and gas manufacturing industry, manufacturing excluding petroleum and gas.

The petroleum refinery and Liquefied Natural Gas (LNG) structured petroleum and gas manufacturing industry. Meanwhile, food, beverage, and tobacco; textile, leather products, and footwear; wood and wood products; paper and printing; fertilizers, chemicals, and rubber; cement and non-metallic mineral, iron and basic steel; transport equipment machinery and apparatus; and other manufacturing products are part of manufacturing, excluding petroleum and gas.

The utilities sector is formatted by three sub-sectors, always defined as one integrity sector, which are electricity, gas, and water supply. The utilities sector has only a small proportion of the secondary sector structure as well as in GDP. Figure 7 shows the existence of manufacturing industries, which formed the secondary sector. From the year 2001-2007, the manufacturing industries lead the contribution to the secondary sector and GDP with a value that tends to increase. This condition is also followed by construction. Moreover, the total value of the secondary sector, from the year 2001-2007, is worth more than Rp 110 trillion.

Figure 7. Secondary Sector 2001-2007 (in billions Rupiah)



Source: CEIC Asia database

2.3. Tertiary Sector

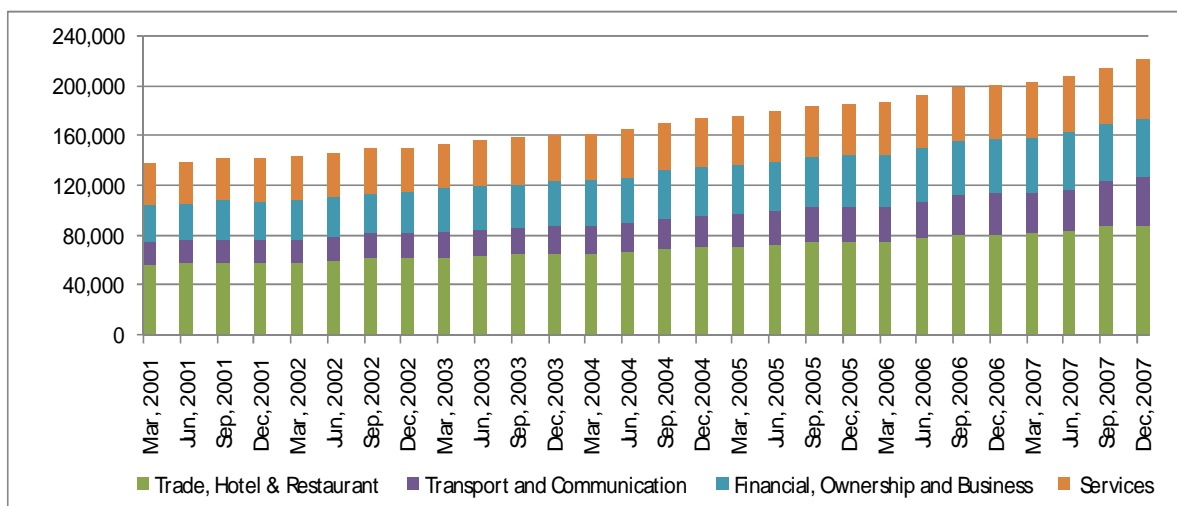
The tertiary sector is also defined as a supporting sector in the economy (Kuntjoro-Jakti, 2007). Even though it is defined as a supporting sector the contribution of this sector to GDP is huge, especially in the period of post-industrialization. Many economists, especially Chenery-Syrquin, have already conducted research about the pattern of development called “Chenery-Syrquin Growth Pattern”. In this invention, Chenery-Syrquin show the gigantic tertiary sector’s development in the post-industrialization period. The value added by the tertiary sector is higher than the other main sectors.

The tertiary sector consists of four subsectors, which are trade, hotel and restaurant; transport and communication; financial ownership and business (FOB); and services. Trade, hotel, and restaurant consist of three subsectors, wholesale and retail trade, hotels, and restaurants. Transport is divided into six subsectors, which are railways, road transport, sea transport, inland and water transport, air transport, and services allied to transport. In addition, FOB is classified by five subsectors. There are banks, non-bank financial institution, services allied to financial, building rental, and business services.

Finally, we cannot ignore the existence of services in the structure of the tertiary sector. Service segregates itself into two sub-sectors, general government and private. General government services consist of admin and defense plus others. Meanwhile, private sector services are classified into three sub-sectors. There are social and community, amusement and recreation, plus personal and household.

Based on Figure 8, trade, hotel, and restaurants, delivers the highest contribution to the tertiary sector. Meanwhile, transport and communication shows the smallest contribution. The total value of the tertiary sector in GDP, from the year 2001-2007, accounts for more than Rp 130 trillion.

Figure 8. Tertiary Sector 2001-2007 (in billions Rupiah)



Source: CEIC database

3. THE RELATIONSHIP BETWEEN THE MAIN SECTORS AND ECONOMIC GROWTH

3.1. Primary Sector and Economic Growth

Therefore, to identify the relationship between primary sector growth and GDP growth, the value of the correlation coefficient and the Granger Causality Test are enough to measure and to know how close the relationship between two variables and what the form of the relationship is, whether it is one way or two way relationship

Table 1. Correlation between Primary Sector and GDP

	LPRIM	LGDP
LPRIM	1.000000	0.641378

Based on Table 1, the correlation coefficient between primary sector growth and GDP growth is 0.641. This means that there is a positive correlation or relationship between primary sector growth and GDP growth. Its value is not too significant enough to show a strong relationship because it is less than 0.8. Nevertheless, it still describes a direct relationship where increasing GDP growth is in line with increasing primary sector growth.

Table 2. The Granger Causality Test between Primary Sector and GDP

Null Hypothesis:	Obs	F-Statistic	Probability
LGDP does not Granger Cause LPRIM	28	8.70529	0.00153
LPRIM does not Granger Cause LGDP		6.35516	0.00635

Table 2 represents the Granger Causality Test between primary sector and GDP. Based on the output above, primary sector growth and GDP growth shows a two-way correlation. The result of the Granger Causality Test output shows the rejection of both null hypotheses, Ho: LGDP does not Granger Cause LPRIM and Ho: LPRIM does not Granger Cause LGDP ($\alpha=5\%$). This means that primary sector growth has an effect on GDP growth and vice versa. The definition of the effect in Granger Causality version is that the past value of primary sector growth can significantly describe the present value of GDP growth, and vice versa. It doesn't mean that GDP growth is a result or an effect

from primary sector growth. In other words, it doesn't mean that primary sector growth is an exogenous variable and GDP growth is an endogenous variable.

3.2. Secondary Sector and Economic Growth

Table 3 shows the correlation coefficient between secondary sector growth and GDP growth. The correlation coefficient between them is 0.987. This means that there is a positive relationship between secondary sector growth and GDP growth. Because its value is more than 0.8, this is significant enough to illustrate a strong relationship. It also describes a direct relationship due to increasing GDP growth in line with increasing secondary sector growth.

Table 3. Correlation between the Secondary Sector and GDP

	LSEC	LGDP
LSEC	1.000000	0.987507

Table 4 depicts the Granger Causality Test between the secondary sector and GDP. Based on the output below, secondary sector growth and GDP growth has a two-way correlation. The result of the Granger Causality Test output shows the rejection of null hypothesis, Ho: LGDP does not Granger Cause LSEC and also the rejection of Ho: LSEC does not Granger Cause LGDP ($\alpha=5\%$). This means that the past value of secondary sector growth can significantly describe the present value of GDP growth, and vice versa.

Table 4. Granger Causality Test between the Secondary Sector and GDP

Null Hypothesis:	Obs	F-Statistic	Probability
LGDP does not Granger Cause LSEC	28	4.69695	0.01948
LSEC does not Granger Cause LGDP		4.14380	0.02905

3.3. Tertiary Sector and Economic Growth

Based on Table 5, the correlation coefficient between tertiary sector growth and GDP growth is 0.992. This means that there is a positive correlation or relationship between tertiary sector growth and GDP growth. This value is significant to exemplify the strong

relationship. It also describes a direct relationship where GDP growth is increasing in line with the increase of tertiary sector growth.

Table 5. Correlation between the Tertiary Sector and GDP

	LTER	LGDP
LTER	1.000000	0.991791

Table 6 shows the Granger Causality Test between the tertiary sector and GDP. Based on the output below, tertiary sector growth and GDP growth only has a one-way correlation. The result of the Granger Causality Test output shows the acceptance of null hypothesis, Ho: LGDP does not Granger Cause LTER and the rejection of Ho: LTER does not Granger Cause LGDP ($\alpha=5\%$). This means that the past value of the tertiary sector growth can significantly describe the present value of GDP growth, but the past value of GDP growth cannot significantly describe the present value of tertiary sector growth.

Table 6. Granger Causality Test between the Tertiary Sector and GDP

Null Hypothesis:	Obs	F-Statistic	Probability
LGDP does not Granger Cause LTER	28	1.93345	0.16744
LTER does not Granger Cause LGDP		8.37941	0.00185

4. CONCLUSION

The Chenery-Syrquin growth pattern is acceptable to illustrate the pattern of growth in Indonesia. Moreover, the Chenery-Syrquin growth pattern also makes sense theoretically and empirically. The pattern of growth in Indonesia after the economic crisis 1997/1998 seems to bracket together with the Chenery-Syrquin growth pattern, particularly in the period of post-industrialization.

Based on the previous explanation about the relationship between the main sectors and economic growth in Indonesia, particularly after the economic crisis 1997/1998 period, it can be found that the tertiary sector has the strongest relationship to economic growth. Meanwhile, the primary sector has the weakest relationship. However, it only shows the strength of the associations between the main sectors and economic growth. The other

important thing that should be considered is the causal relationship between the main sectors and economic growth.

The Granger Causality Test illustrates an interesting phenomenon that there is a two-way relationship between primary sector and economic growth in Indonesia. The two-way correlation also happens in the secondary sector and, surprisingly, there is only a one-way correlation between the tertiary sector and economic growth. We know that the secondary sector, which is relied on by the manufacturing industry, and tertiary sector, which is led by services are the sectors that have always been noticed by government or policy makers, especially in the case of Indonesia. Meanwhile, the primary sector is not as attractive anymore because of its declining contribution to economic growth and also by means of globalization.

In summary, the primary sector is definitely still needed to support Indonesia's economic growth, especially after the economic crisis 1997/1998. Even though its contribution to economic growth tends to be decreasing, the primary sector is expected to become a key part of Indonesia's growth story. Furthermore, the reason why the primary sector is still appropriate to enhance Indonesia's economic growth has been proved empirically.

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