

GROWTH, INEQUALITY, AND POVERTY: An Analysis of Pro-Poor Growth in Indonesia

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in partial fulfilment of the requirements for obtaining the degree of MASTER OF ARTS IN DEVELOPMENT STUDIES

Major: Economic of Development (ECD)

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> The Hague, The Netherlands September 2017

Acknowledgment

The author will give thanks to Allah, the God Almighty who always guides in every step in one of the most critical stages of the writer's life. The author feels very grateful to be able to study in this very extraordinary program, hopefully, after going through the learning process, the author can be a better man.

The author would say sincere thanks to Dr. Elissaios Papyrakis for his guidance and support from the beginning through the comments, solutions, and enlightenment that is very useful for the completion of the thesis. The author would also like to thank Prof. Dr. S. M. Murshed is pleased to provide extraordinary knowledge through comments and detailed instructions.

For writer's parents, especially Mother, there is nothing more the writer can say except the deepest thanks, for all the prayers, support, and affection in the moment of despair. To all the members of the family, let's hope this is a big step for us to go ahead and pursue happiness. Without the support, this journey will never succeed.

It has been a steep and arduous challenge for almost three years in the author's life. Someday, what the author has learned from this program can bring benefits to his family and his country.

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Abstract

In the concept of pro-poor growth, economic growth accompanied by fair income distribution will accelerate the rate of poverty reduction. Employing extensive data of household expenditures and some economic indicators, this study will examine the performance of economic growth in Indonesia whether it has been pro-poor over the period 2005-2013. We employ two methods in this article, Growth Incidence Curve (GIC) method, and Pro-Poor Growth Index (PPGI) method. By applying the GIC method, our empirical results indicate that economic growth in Indonesia has not been pro-poor during the observation period. The curve shows that the highest income distribution enjoys increased consumption more than the lower percentile. Furthermore, PPGI method has revealed that economic growth, inequality, and an interaction term between economic growth and inequality have been significant to influence poverty incidence in Indonesia. Our empirical result also reveals that among three sectors, it was manufacturing industry that significantly reduced the poverty incidence, while the agriculture unexpectedly had a devastating impact on poverty alleviation efforts. The services sector, meanwhile, has not contributed to poverty alleviation in Indonesia. Furthermore, none of the government spending in education and health that significantly contributes to poverty alleviation.

Keywords

Poverty, Economic Growth, Inequality, Pro-Poor Growth

Chapter 1 Introduction

1.1 Background

Poverty reduction is one of the most important goals in economic development. In the development perspective, poverty is an obstacle that blocks human beings to meet their basic needs. It could also pull the trigger of many social problems within society, such as crime, poor health, or mental illness. Given the enormous negative impact in social life, efforts to alleviate poverty, therefore, should be prioritized in the development agenda.

In the development program, economic growth is believed to be the best potion to cure poverty. The importance of economic growth was initially emphasized by a concept, famous in the period of 1950s and 1960s, called a trickle-down hypothesis. The main idea of the theory believes that growth alone can reduce the number of poor people. The concept states that the benefits of growth will come first to rich people, and eventually, the benefits will stream down to poor individuals in the society. It is said that "the poor can only have benefited indirectly through a vertical flow from the rich; thus, the proportional gain from the growth will always going less for the people" (as cited in Kakwani and Pernia 2000: 2).

The best example of the essential role of economic growth on poverty alleviation is shown by the story of the People's Republic of China (PRC). Based on the World Bank database, PRC is now recognized as one of the world's economic giants regarding per capita income. The country has been able to achieve their success since the government promoted economic reforms, started in the 1970s, with the focus on high economic productivity. The effort has shifted the country from ninth to the second position in Gross Domestic Product (GDP) globally.

From the Figure 1, it can be seen that PRC has been maintaining their average growth over 9% per annum from 2001 to 2015, while the world's GDP experienced economic deceleration from 2006 to 2015. Even, when the world was suffering from a financial crisis in the late 2000s, PRC was able to maintain their economy from the impact of the crisis. Since 2011, PRC's growth has slowed, though it was still better than the entire world.



Figure 1 GDP per Capita and Growth: PRC and the World

Source: The World Bank (2017)

PRC's strategy on boosting economic growth brought some positive results mainly on poverty reduction. It can be seen from Figure 2 that since the early 2000s, the percentage of poor people in PRC went down from about 32% to less than 2% in 2013. Studies by Lin (2003) and Montalvo and Ravallion (2010) confirmed that economic growth in PRC has successfully reduced poverty in China. However, regarding income distribution, PRC is also known for a high degree of inequality. Before the economic reform, PRC was acknowledged as an egalitarian society. By 2012, World Bank (2017) published that the Gini ratio in PRC is recorded at 42.2%. Lin (2003) later stated that high levels of inequality had reduced the benefits of economic growth.





While PRC's case shows us the magnificent effect of growth on poverty; however, some economists have their doubts over the validity of the argument that poverty reduction solely

Source: The World Bank (2017)

depends on economic growth. One of the concerns over trickle-down concept is that in some cases, there are possibilities that increasing poverty rate could also accompany high economic growth. Past experiences have revealed that it was the rich who got more advantages or welfare from the economic growth thus, the gap between the poor and the rich became larger. Bhagwati (1988) called this situation as "immiserizing" growth, a situation where inequality has a greater impact than the benefits of economic growth. Therefore, – it creates deterioration by increasing the number of poor people (as cited in Kakwani and Pernia 2000: 2).

As a consequence, there is argument suggesting that the poverty alleviation program will be useful when growth is accompanied by the even distribution of income (Kakwani and Son 2003; Kakwani et al. 2010). This argument believes that not only the total revenues growth is necessary for poverty alleviation, but also the quality of income distribution. When economic growth is followed by equal distribution of individual income, the poor will likely have better chance to obtain more income. So, people who are below the poverty line can improve their welfares and escape poverty.

The debate over the measure of pro-poor growth, therefore, can be sum up into two different perspectives. The first is the argument which does not explicitly emphasize the need for inequality when measuring pro-poor growth. This case believes that the only matter when determining pro-poor growth is the change of poverty level within the observed period, while the change in inequality is naturally only a part to achieve poverty reduction (Ravallion and Chen 2003; Ravallion 2004). According to the proponents, pro-poor growth is an increase of national income accompanied by a decrease of the poverty level. In other words, as long as the decline in poverty follows economic growth, we can still categorize it into pro-poor growth, despite no improvement in the distribution of the income. However, they believe that if the benefits are well distributed within the society, economic growth will produce the higher magnitude of poverty reduction.

The second is the argument which takes into account inequality when measuring pro-poor growth. This view believes that growth is pro-poor when the poor not only achieve gain from economic to meet the basic necessities but also receive more benefits of growth than those who are not poor (Kakwani and Pernia 2000; Kakwani and Son 2010). According to these proponents, pro-poor growth will be achieved when the equitable distribution of income follows growth in total revenues.

The connection between economic growth and inequality on poverty has become an important part in the course of Indonesia's economic development. Although Indonesia has not experienced fast growth like PRC, Indonesia has tried to establish some strategies to achieve sustainable economic growth. Since the 1960s, those strategies were implemented to reduce poverty level influenced by the concept of trickle-down effect. History proved that the expected result of the trickle-down effect could not be said as the successful one. It was only since 2004 that Indonesia began to formulate the framework outlined in Indonesia's National Medium Term Development Plan to implement the three strategies of economic development, which are a 'pro-growth, pro-job, and pro-poor' strategy, while also maintaining equitable income distribution. These three strategies are expected to drive the acceleration of economic growth that can provide more employment opportunities. Thus, more and more people, especially the poor, can enjoy the results of development and get out of poverty.

A year after the National Medium Term Development Plan ran, from the Figure 3, we can see that Indonesia has experienced fluctuated economic growth over eight years. The growth rates were still above 4% each year, with the highest growth in 2011 for about 5%. The year of 2009 was the time when most countries in the world were experiencing the impact of the global crisis. Indonesia had a no different story as we can see by the declines of growth rate which are quite high compared to the previous period.



Figure 3 Indonesia: Economic Growth and Headcount Index (P0)

Source: BPS - Statistic Indonesia

On the contrary, there was a trend in the number of poor people offers somewhat promising condition for the development goal. Although there was an increase in the percentage of poor

people between 2005 and 2006, the following years showed declining trend of the poverty rate in Indonesia. From approximately 17.75% at 2006, the incidence of poverty was going down to 11.47% at 2013 or decreasing about 6% for seven years.

While most economists believe that poverty alleviation strategies should pay attention to the level of income distribution within society, sometimes, this is not always the case. In Indonesia, even though the number of poor people seemed to fall from 2005 to 2013, the inequality trend was disappointing. From Figure 4, we can see that the curve depicts a trend of increasing inequality, in other words, the distribution of income tended to get worse from 2005 to 2013. It was only in 2008 when the Gini ratio decreased from about 0.37 to 0.25. Overall, we can say that equitable income distribution did not follow Indonesia's economic growths over the observed periods.



Figure 4 Gini Ratio: Indonesia

Source: BPS - Statistic Indonesia

1.2 Objectives

Looking at the various economic indicators in section 1.1 which includes economic growth, inequality, and poverty, we cannot conclude whether Indonesia's economic growth is already pro-poor, or not. Although when we see an increasing trend of inequality, it is an early indication that economic development has not been optimal in reducing the poverty rate. For that reason, this study is aimed to assess whether or not Indonesia's economic growth is already pro-poor. Also, it is intended to measure to what extent the impact of economic growth and inequality on poverty in Indonesia. The empirical findings of this article are supposed to provide an overview of the success of economic development programs designed

by the government in the National Medium Term Development Plan to achieve economic growth that gives benefits more to the poor, in particular through the strategies of pro-poor and pro-growth.

This study also intends to provide added value by revealing how other variables can affect poverty rate. Those variables include government spending in education and health and sectoral composition of the economy. The study investigates the impact of government expenditures on education and health or sectoral composition on poverty level in Indonesia.

1.3 Research Questions

Considering the objectives of the paper, the author proposes research question as follow:

- a. Is economic growth in Indonesia from 2005 to 2013 already pro-poor using Growth Incidence Curve (GIC) method?
- b. How is economic growth, inequality and other determinants explaining the performance of poverty alleviation from 2005 to 2013 in Indonesia using (Pro-Poor Growth Index approach)?

1.4 Scope of the Research

The economic variables investigated in this study cover the period from 2005 to 2013. The selection of this time is due to two reasons. The first is the availability of data, especially data on government spending that is only available adequately from 2005 to 2013. The second is the study intends to focus on the period in which three development strategies, namely progrowth, pro-job, and pro-poor, have been implemented by the Indonesian government. Furthermore, this study uses data at regency and municipal level throughout Indonesia so that we can obtain a more comprehensive picture of economic development in Indonesia by using regional approach.

1.5 Contribution to Development Studies

A program to boost economic growth needs to consider the distribution of income so that the poor can get the most benefit of the growth. This article attempts to examine whether economic growth has been pro-poor and to find out how economic growth and inequality can influence the development goal. This article, therefore, contributes to the literature because of two reasons. First, the study combines two different methods to measure pro-poor growth, GIC method, and PPGI method. Second, the research uses a large panel dataset which covers

490 regencies and municipalities from 33 provinces in Indonesia over nine years of the period.

1.6 Structure of Research Paper

For answering the research question, the study is divided into five chapters.

Chapter 1 is Introduction.

Chapter 2 is Key Concepts and Literature Review.

This chapter presents the conceptual framework of pro-poor growth and the relationships among poverty level, economic growth, inequality, government spending, and sectoral composition. The theories are also supported by some empirical studies to build the model and the hypothesis of the research.

Chapter 3 is the Research Methodology.

This chapter reveals some variables used in the study and the source of that data. The specification model is also presented as a basis for answering research questions and for achieving research objectives.

Chapter 4 is the Analysis of Empirical Results

In this chapter, the author explains the finding of the model. The empirical results are equipped with how independent and dependent variables are connected to the literature review built in the earlier section.

Chapter 5 is the Conclusion.

In this paper, the author draws the conclusion based on the empirical results and some limitation of the research about the previous studies.

Chapter 2 Key Concepts and Literature Review

This chapter discusses the idea of pro-poor growth, and some components relate to it, namely poverty, economic growth, and inequality. The discussion is also complemented by some variables, which is government spending in education and health or sectoral composition that affect the level of poverty. The selection of these variables is based on theoretical considerations and empirical studies that have been done in previous research to obtain unbiased estimation in explaining the links between poverty and economic growth, inequality, government spending, and sectoral composition.

2.1 Key Concept

2.1.1 Key Concept of Poverty

Poverty is defined as a condition when household fails to meet the daily needs, but it is different from one country to another (United Nations 2017). Internationally speaking, the minimum level of income to identify poverty is when the income is less than \$1.90 a day (World Bank 2015). The minimum requirement that separates poor and non-poor is translated into a financial measure known as the poverty line.

There are two methods of measuring poverty, which is "actual or observed consumption" approach and expenditure or income approach line (Ray 1998: 251). The former viewed poverty line as a minimum level of nutrition which needed to be consumed by an individual. Meanwhile, the latter set poverty line simply by determining the minimum level of income or expenditure. Ray (1998) later explained that each approach has its advantage and disadvantages. Nutrition-based poverty lines may offer a logical thinking that the changes in income are expected to influence the behavior of consuming nutrient foods. However, the skepticism over this approach is that the more income received, sometimes, people do not always consume more nutritious foods. Therefore, the correlation between income and nutrient food can be ambiguous. Meanwhile, the advantage of expenditure or income-based poverty line is a lot easier in term of collecting data than the nutrition-based poverty line.

How we measure poverty line will always differ from one place to another and from time to time. Therefore, in economics, the notion of poverty can be divided into absolute poverty and relative poverty. In absolute term, Ray (1998, 251) explained that poverty line is a minimum condition where an individual could fulfill the basic necessities or could be able to function in daily life. The line is set at a constant level over time; so that, we can consider when an individual is deemed to live in "absolute human misery" (Todaro and Smith 2009: 218). Whereas in the relative concept, how we determine poverty line be relatively changing over time and place. Thus, the minimum standard "must be comparatively evaluated to the prevailing economic standard" (Ibid.). In this sense, the relative measure will depend on how incomes are distributed in the society. When a country becomes more prosperous, there is a tendency for the state to revise its poverty line to be higher. So, even though the poor can increase their incomes, there is a possibility for poverty to rise if the whole population also improve their revenues (Ravallion 2004: 3).

Foster et al. (1984) developed a method widely known by economist to measure the type of poverty. Three measures often used in the economy are first, the Headcount Index (HCI – P0), defined as the proportion of poor people (%) in the population. Second, the Poverty Gap Index (P1), defined as "the extent to which individuals fall below the poverty line (the poverty gaps) as a proportion of the poverty threshold." Third, the Squared Poverty Gap Index (P2), defined as "the average value of the squares of the poverty gaps relative to the poverty line" (World Bank 2005: 69).

2.1.2 Key Concept of Economic Growth

In macroeconomic perspective, economic growth is defined as an increase in the total amount of goods and services produced in a region over a period. In the country level, the total amount of produced goods and services is called Gross Domestic Product (GDP), while in regional level is called Gross Regional Domestic Product (GRDP). GDP can be calculated using three approaches, which are production, income, and expenditure approach. In production approach, GDP indicates the aggregate value of goods and services produced within a country over given period. Under this method, the output of each sector in the economy, such as agricultural, manufacturing, mining, and services, are summed to obtain the aggregate output. Whereas in income approach, the total GDP is calculated by summing up all of the income received by production factors, namely wages for labor, rents for land, interests for capital, and profits for entrepreneurship. The expenditure approach, meanwhile, represents all spending in the economy, also known as aggregate demand, which are consumer spending, government spending, investment, and net exports.

The measure usually used to represent human living standards is called GDP per capita that equals to the total incomes of the society in one period divided by the number of individuals within a region. If an area can increase the total output by 7 percent annually, but the population increases by 3 % per annum, thus we can say that the growth of output per capita is about 4 % per annum. Because GDP relates to the total output, the more people get involved in producing goods and services; there will be higher likelihood that GDP per capita will increase. Regarding development, higher GDP per capita means that the income level of the community increases so does the level of economic development.

Thirlwall (2014), nevertheless, reminds us that economic growth is not similar to economic development. While it is true that an improvement in the standard of living relates to the increase in income per capita, the development process requires other dimensions than only economic variable. Economic growth alone cannot explain whether the income has been well distributed in the society or whether people have improved the quality of life regarding health or knowledge. However, the increase in economic growth is one of the important factors to achieve socio-economic development.

While the importance of economic growth is undeniable on poverty reduction, there is a debate on how economic growth can be considered as pro-poor growth. As discussed earlier, there are two major arguments of the issue. First, economic growth is claimed to be pro-poor growth when those categorized as the poor can benefit in the absolute rate of poverty. Thus, as long as the reduction in poverty level follows economic growth, it can be called as pro-poor growth (Ibid.). Second, economic growth has to be supported by the better distribution of income to claim as pro-poor growth. Therefore, the poor would receive a higher rate of revenue change than those who are not poor (Ibid.). The difference in those definitions leads to several alternatives in measuring pro-poor growth.

Cited from Son (2007: 1), there are at least five methods to examine the pro-poor growth measure, those methods are:

a. Poverty Bias of Growth (PBG)

This method proposed by McCulloch and Baulch (2000) focusing on inequality reduction. The PBG is calculated from "the negative of the change in poverty when inequality changes in the absence of growth" (Zaman et al. 2010: 305).

b. Pro-Poor Growth Index (PPGI)

Inspired by McCulloch and Baulch (2000), Kakwani and Pernia (2000) developed a method built to determine whether or not growth is already pro-poor with regard two conditions. First, the benefits brought by growth must be enjoyed by the poor more than the non-poor. Second, the growth not only reduces poverty rate but also decreases inequality level during growth course. Based on those logical thinking, they created Pro-Poor Growth Index (PPGI).

c. Poverty Equivalent Growth Rate (PEGR)

Kakwani and Son (2008) realized that something was missing in PPGI approach since it could not capture the level of actual growth rate. They introduced a measure called Poverty Equivalent Growth Rate (PEGR). They stated the definition by "the growth rate that will result in the same level of poverty reduction as the present growth rate if the growth process had not been accompanied by any change in inequality (when everyone in society receives the same proportion of benefits from growth" (Ibid.).

d. Growth Incidence Curve (GIC) and Poverty Growth Curve (PGC)

GIC explains how far each percentile point has increased its income or expenditures level. "If the curve is positive at all percentile points, then there is an unambiguous reduction in poverty between two periods" (Ibid.). To improve the limitation in GIC, Son (2004) then offered alternative approach called Poverty Growth Curve (PGC). "The PGC can be estimated by the growth rate of mean income of the poor up to the p-th percentile" (Ibid.).

2.1.3 Key Concept of Inequality

According to Todaro and Smith (2009: 210-216), income distribution can be divided into two different approaches. First is the personal or size distribution of revenue. In this context, the income distribution can be seen as an amount of income received by individual or household; therefore, it does not matter how or where they get the income. Second is functional or factor share distribution of revenue. In this context, the proportion of revenue is calculated to each of the factors of production; therefore, how much land, labor, or capital will receive in the economy depend on their level of productivity or their contribution in the manufacturing process.

Later on, Todaro and Smith (2009: 222-223) revealed that there would be at least two consequences of a high rate of inequality. First, there will be economic inefficiency. It can happen because the high level of inequality means that only small portion of total income will

go to poor people or low-income individuals. So, it restricts them from moving out of their condition. They eventually could not have a chance to access some credits or resources which possibly help them increase their income. Meanwhile, a group of rich people may enjoy the huge share of total revenues, but they tend to be more consumptive for luxury goods, not in the productive investment. As a result, it will reduce productivity within a country. Second, the inequality will cause problems in social stability and solidarity. Todaro and Smith believed that high-income people tend to use their power in the economy to find advantages which can accommodate them to be the beneficiaries of some policies or regulations.

A measure often used to determine how incomes are distributed within society is the Gini rate. The ratio is based on Lorenz curve, "a cumulative frequency curve that compares the distribution of a particular variable (e.g., income) with the uniform distribution that represents equality" (World Bank 2005: 97). When higher inequality occurs, it indicates that significant amount of share in the total income has been enjoyed by only a few people in the population, while most people only receive the small proportion of total earnings in the region. When fewer revenues are distributed well in the population, the higher the level of inequality occurs.

2.2 Literature Review

2.2.1 Economic Growth and Poverty

2.2.1.1 The Relationship between Economic Growth and Poverty

It has become the consensus among the economist that economic growth is the minimum requirement to ensure that poverty alleviation program can be successfully achieved. Son (2007: 3) wrote that to reduce the poverty rate, growth is a minimum receipt but not sufficient to achieve the goal. Without growth, it may be difficult, if it can be said as impossible to reduce the poverty rate.

According to Nayyar (2005: 1632), there are three mechanisms of how economic growth can reduce poverty level. First, economic growth can generate income effect; there by the poor would also raise their income. Second, rising economic growth will create job opportunities because of a higher rate of investment; accordingly, it helps the poor to get a job and earn salaries. Third, the fast growth will create multiplier effects because when the poor can get more revenues from their asset, they can increase their investment and sustain the consumption.

Nevertheless, some economists think that rapid growth can create disadvantages for the poor since they will be left behind to the change brought by economic growth. Todaro and Smith (2009) then emphasized some reasons why growth and poverty reduction should be achieved

mutually. First, the policies which ensure that poverty alleviation follows economic growth help people who suffer in poverty not only to reach their standard of life but also the productivity and income of the overall economy. Second, the strategies to raise the level of revenue of the poor will bring them out from a condition that reduces their possibilities to fulfill their need. When they have enough money, they will spend it to consume goods. For that reason, it increases demand, especially local products. Unlike wealthy people who prefer to consume imported goods, which in turn create a greater market and economic growth as well. Third, a reduction in the number of poor people is incentive to promote participation in the process of development.

2.2.1.2 Empirical Study of Economic Growth and Poverty

How economic growth is essential for reducing the number of poor people has been proposed by some economist (Dollar and Kraay 2002, Bourguignon 2004, Warr 2006, Dollar et al. 2016). This argument is supported by numerous findings that attest the beneficial effect of economic growth on the poor. Some studies explained in the following paragraph reveal the good impact of economic growth in poverty reduction. However, the success of economic growth to reduce poverty is believed to be highly correlated with the characteristic of each country like initial income, the human capital level, or institutional quality (Pernia 2003: 1).

Dollar et al. (2016) concluded that economic growth is a factor behind income increase of the poorest quintile after investigating 121 countries worldwide within 40 years. That argument was based on the fact that while mean incomes in the poorest quintile grew at the same rate as mean incomes, the variation in the revenues of the poorest quintile was relatively small compared to the change in mean revenues. In other words, the earnings of people below poverty line are influenced by economic growth. Thus economic growth is an essential element to improve poor people lives.

Using estimation method called the Generalized Method of Moments (GMM), Perera and Lee (2013: 83) examined the impact of economic growth on poverty in East and South Asia region since 1985 to 2009. They found that economic growth in the area has been a success to reduce poverty and even the elasticity of economic growth to poverty in South East Asia was higher than the global elasticity of growth to poverty. To alleviate poverty, then, some economic policies should be focused on increasing growth, for example, a system which supports openness in trade will create higher average incomes in the short run, therefore, will lead to greater productivity in the long term (Ibid.).

A study by Wodon (1999), in one of his model, tried to examine the impact of economic growth on poverty. He decomposed the effect of growth to poverty into two different elasticities, namely gross and net elasticity of poverty to growth. The gross elasticity of poverty to growth measures the effect of economic growth on poverty when inequality is constant, whereas the net elasticity takes into account the change of inequality when measuring the impact of growth and poverty. The model is inspired by Pro-Poor Growth Model (PPGI) by Kakwani (1993), but he offered different approach by using panel data set with double log form in his model specification. The data set was obtained from Bangladesh's households survey. The result showed that economic growth reduced the poverty rate during observed years, assuming inequality held constant. The impact was even larger on the higher order of poverty measures, which are P0, P1, and P2. In term of net elasticity of poverty to growth, an increase in growth reduced the percentage of poor people, but in lower magnitude compared to what was the result when holding the inequality constant.

Warr (2006) attempted to see how growth was essential to the program of poverty reduction. The model used poverty incidence data obtained from seven household surveys in Southeast Asia countries. Besides aggregate growth, he also investigated how the growth of output, especially in the agricultural, industrial, and services sectors could affect poverty reduction within a country. He found that all countries have successfully achieved their goals to reduce the number of poverty incidence during the observed periods. The significant effect of aggregate growth on poverty reduction could be found in four countries, which were Thailand, Indonesia, Malaysia, and the Philippines, whereas the changes in the composition of each sector in total output have been proven to be less impact in lowering poverty than aggregate growth.

2.2.2 Inequality and Poverty

2.2.2.1 The Relationship between Inequality and Poverty

Kakwani and Son (2003: 417) stated that the policy to reduce the poverty level need to be considered the better distribution of income so that the poor people will gain more in the development agenda. They also claimed that "addresses both distributional concerns and poverty reduction could lead to enhancement of both economic growth and equity." When a country experiences economic growth, usually, it is the rich who obtain a large sum of income. When the process of poverty alleviation is also focused on the equitable distribution of income in all layers of society, especially to the poor; then, all components of the economy

will be able to contribute to the acceleration of economic growth while achieving equal distribution of income.

However, there is also an argument about the special bond between economic growth and inequality that could result in a trade-off between inequality and poverty. It was Simon Kuznets in 1955 who constructed a hypothetical relationship between economic growth and inequality which took the shape of an inverted U-curve. Kuznets believed that in the early stages of economic growth, income per capita would increase at certain level accompanied by the growth of inequality level. Then, in the intermediate phase, the income distribution remains unchanged but eventually decreases when the country has reached its prosperity. The high rate of inequality in the early stages of economic growth is related to the process of change from traditional to industrialized societies. The hypothesis assumes that there are two sectors of the economy, agricultural sector (traditional) in rural areas characterized by low income per capita and low-level inequality and industrial sector (modern) in urban areas where the income per capita is high as well as the level of inequality.

Kuznets revealed that economic growth occurs when rural workers move to urban areas or when traditional sector labor shifts to the modern sector to find a job. Kuznets theory also assumes that there is no change in income distribution within each area before the migration, so when rural workers move to urban areas, there will be an increase in urban inequality, though the number of poor people has decreased. That is why according to Kuznets theory, in the early stages of development, there will be a trade-off between inequality and poverty. At the beginning of development process, the increase of income per capita will always be followed by high inequality, yet at a certain point, the distribution of income will get better and eventually the inequality level decreases as the welfare in the country increases.

Another argument in favor of Kuznets' theory about the trade-off between inequality and poverty holds on the assumption that developing countries usually contain their level of inequality by controlling activities in the economy; so that, everyone in the economy could share the incomes equally. As has been exemplified in the previous section, PRC was an egalitarian society before the country began its economic reform. When the control was set to be free during economic reform, the inequality level in China rose as economic growth increased, while poverty fell (Ravallion 2005: 171).

The existence of such trade-off is opposed by some economists, one of which is Ravallion (2004) who argued that no benefit can be brought by higher inequality because inequality will withstand the 'good' impact of growth on poverty reduction. Economic growth means that the

capacity in economic increases, while the better distribution of income will ensure people to receive more equitable welfare; therefore, it can have a positive impact on poverty alleviation. He then stated that the gains from growth would go less to the poor when initial inequality is high. The estimated elasticity of poverty to growth will become less and less when inequality level close to the maximum (equals to 1); thus, the more share of economic growth will be enjoyed by the richest population. Besides initial inequality, another factor which has an impact on the rate of poverty reduction is the change of income distribution related to "geographical and sectoral growth patterns." Promoting growth which takes into consideration of sectoral growth pattern or geographical condition can deliver greater and equitable growth; so that, poverty reduction program can be more successful.

Bourguignon (2004) illustrated the relationship among growth, income inequality, and poverty reduction. He believed that the number of poor people could be diminished by improving the distribution of the earnings or maintaining economic growth. Ensuring poor people to get a more equitable share of the total earnings in the society will allow that group to earn additional welfare; so that, they can meet their daily basic needs. Meanwhile, by maintaining growth, a nation can keep increasing the level of income; therefore, they can raise the average income of the society. Improving average income means a higher possibility of rising standard of living which in turn could reduce poverty level.

Bourguignon (2004) also stated that the effect of economic growth and inequality on poverty might differ from one country to another. The reason is that each country has its initial level of income and inequality. His idea is based on the assumption that "both growth and distribution elasticity of poverty depends positively on the degree of development, and negatively, on the level of inequality" (Ibid.). In other words, when a country wants to implement a policy to reduce poverty level during a particular time, the state should consider the initial condition of income level and inequality. He then gave examples, in a country where inequality and income level are low, growth is possibly more significant than the changes in inequality, whereas, in a middle-income country where inequality level is high, a better distribution of income is more needed than economic growth.

2.2.2.2 Empirical Study of Inequality and Poverty

How well benefits are distributed in the economy will influence the successfulness of the poverty alleviation policy. The impact of inequality on poverty can be both positive and negative. The adverse effect here means that an increasing level of inequality could hamper the benefits of growth because the poor become poorer, while the non-poor can raise their

income. Hence, lowering chances for those groups to receive opportunities to improve their lives would reduce social mobility and the potential for economic development. Even when the impact of inequality on poverty is higher than the incidence of growth on poverty, the poor will suffer. As a result, it will increase the poverty level.

Meanwhile, not every economist thinks that inequality is always disadvantageous. Because in some stages of development, when massive growth is needed to reduce poverty, it is common when the rise of inequality accompanies growth. At this juncture, the impact of inequality on poverty is 'positive' because the increase in inequality following economic growth could reduce the number of poor people. Therefore, strategies in economic development need to find the most optimal option in poverty alleviation program.

One example which proves that the improvement in income distribution could bring a greater chance of poverty reduction is a study conducted by Lin (2003). He found that maintaining the level of inequality is an essential factor to ensure the success of poverty alleviation. The research also tried to determine the effect of growth to poverty, by examining regression analysis using data of net income per capita, Gini coefficient, and some measures of poverty. The result revealed the importance of economic growth to reduce poverty, but the increase in inequality reduced the effectiveness of economic growth impact. He also noted that the initial level of inequality is essential to determine growth policy within countries with different stages of development.

The negative effect of inequality to poverty reduction was also found by Wodon (1999). His investigation in Bangladesh showed that a rise in inequality would increase poverty level. The effect of the change in inequality was also greater in higher order poverty measures. It means that the poorest person within a group of poor people was affected by the increase in inequality level, not only those who were close to the poverty line.

Some years before Lin started his study, Ravallion and Chen (1997: 2-3) have already examined the elasticity of poverty and inequality to economic growth using cross countries data obtained from the household surveys of sixty-seven countries. There was substantial evidence that higher rates of poverty reduction correlated with higher rates of economic growth. However, the effect of inequality on poverty has not been strong enough to reduce the elasticity of growth in poverty. He also mentioned that in developing countries, the impact of inequality on poverty was not statistically significant. In other words, when developing countries could not raise their income level, the rate of poverty reduction was expected to be zero.

In contrast to some studies described earlier, there is evidence that increase in inequality could still possibly reduce poverty. Ravallion (2005) found a proof of the trade-off between inequality and poverty. Using cross countries data which cover 70 countries, he revealed that there was no evidence of a trade-off between poverty and relative inequality. He took an example of China, a country widely known for high economic growth as well as inequality. In China, despite poverty level was massively reduced, the trade-off between relative inequality and poverty did not happen. However, when he analyzed the link using absolute inequality, as reflected by absolute Gini index, the result has shown a trade-off between absolute inequality and poverty.

2.2.3 Economic Growth, Inequality and Poverty

Many studies have been carried to investigate the relationship between economic growth, inequality, and poverty. One of which was made by Silva (2016) who decomposed the changes in poverty level into two components, economic growth and inequality, based on the methodologies proposed by Kakwani and Pernia (2000) and Kakwani and Son (2008). The study used household surveys of income and expenditure in Sri Lanka over the period 1990-2010.

Using GIC proposed by Kakwani and Pernia (2000), the study concluded that only the top percentile of the population grew the expenditures more than average growth rate of spending. It means that "only a few households moved up along with the average growth rate of the economy" (Ibid.). The slope of the curve also indicated that the inequality level over 20 years tended to rise along with economic growth. The rising inequality was supported by the evidence that each percentile did not experience growth in economy proportionally. In other words, the economic growth in Sri Lanka exclusively gave more benefits to the rich than to the poor households.

The result of the decomposing the changes in headcount poverty by the effect of economic growth and inequality showed that both the effects of economic growth and inequality were statistically significant to the change in poverty level. The impact of redistribution component had a positive sign. It means that an increase in inequality would raise poverty, while the negative sign of the effect growth on poverty implies that the rise of growth would reduce poverty. Therefore, the positive impact of economic growth in poverty level was reduced by the effect of inequality on poverty.

Another study that used an alternative approach to find the result of growth and income distribution to poverty was conducted by Maasoumi and Mahmoudi (2013). The authors used a nonparametric methodology that was free of residual to decompose the changes in poverty using the data of expenditures in Iran at urban and rural areas for the year 2000, 2004, and 2009. The finding supported the idea of the good effect of economic growth to poverty reduction and the adverse effect of inequality on poverty alleviation. The result also exhibited evidence that changed in rural and urban poverty was influenced by the changes of growth and income distribution.

2.2.4 Government Spending and Poverty2.2.4.1 The Relationship between Government Spending and Poverty

In the macroeconomic context, government spending is one of the components of aggregate demand. The public expenditure, particularly in the social sector, is allocated to fill the gaps that the market cannot provide; so that, prosperity in society can be attained. Especially for the poor, the obstacle faced in their daily lives is not only to fulfill the basic needs but also to have access for obtaining those needs, for instance, the opportunity to get a job or to acquire skill which can generate a decent income. This situation requires government intervention by making fiscal policy. One of the policies is to invest human resources, or in some literature are known as human capital, for instances, government spending on education and health. The outcome of those types of expenditures in society is the change in the quality of human being. The indicators usually used to indicate the variations in the quality of human being are mean years of schooling and life expectancy indices.

By allocating expenditures in education and health, the government can create greater access for people to improve their capabilities; thus, it can help people to produce more and better production. In other words, it also means increasing their productivities. Moreover, the poor should be the primary beneficiaries of the spending in education and health. If they can improve their capabilities, it can be expected that the poor could raise the incomes which in turn could help them escaping poverty.

While it has been widely recognized that education and health take an essential role in the spirit of poverty reduction, there is skepticism that some policies in education and health spending may not be well addressed; so that, the poor are not the side who receive advantages from them. Some of the questions that often arise when discussing the effectiveness of education and health spending on poverty alleviation relate to the weak targeting of expenditures and corruption behavior of the government officer. Other concerns are the poor

quality of mechanism to deliver public service and the urgency of targeting those spending on poor people (Selden and Wasylenko 1995; Foster et al. 2002; World Bank 2004 as cited in Wilhelm and Fiestas 2005).

Foster et al. (2002) said that there are several requirements to be implemented when allocating pro-poor budget to ensure its effectiveness. Those requirements are, first, minimizing the level of corruption. Second, providing better public sector wages and establishing a system to assess performance by civil servants. Third, constructing a system to monitor the effectiveness of government spending. Fourth, developing decentralization. Fifth, providing a mechanism so that civil society can involve in ensuring accountability. Sixth, conducting a formalized monitoring system where both government and non-government organizations can cooperate. Seventh, encouraging the weak to take action in the decision making.

2.2.4.2 Empirical Study of Government Spending and Poverty

Some studies have been undertaken to investigate the effect of government expenditure (for example is in health, education, and public investment) on poverty reduction. Even though some arguments believe that spending in sectors like education and health could be beneficial to alleviate poverty, some evidence shows the opposite idea. Research by World Bank (2004) found that the poor have only enjoyed a little of the government spending on health and education. In other words, it was the non-poor who got enormous benefits from services provided by the government through expenditures on both sectors (as cited in Wilhelm and Fiestas, 2005: 7). It was then added to the evidence in Nepal, in which 46% government expenditure on education went to the richest fifth, while the poorest only got slightly more than 10% of spending. Another example is from India where the poorest fifth have only enjoyed one-third of the total health care spending provided by government (Peters et al. 2002 as cited in Wilhelm and Fiestas, 2005: 5).

2.2.5 Sectoral Composition and Poverty

2.2.5.1 The Relationship between Sectoral Composition and Poverty

It is true that that aggregate growth is a decisive factor in poverty alleviation, but the aggregate growth could not explain in detail about which sector in the economy that gives higher impact on poverty reduction or may even hurt increasing poverty. Some studies in economic development also reveal that contribution of financial sector differs from one country to another, while in most developing countries, it seems that agricultural sector has a greater impact than other areas (Warr 2006: 280). By knowing which sector has the most

optimum effect in poverty alleviation, the policy on economic growth can be focused on the area that is proven to give more benefits to the poor.

Warr (2006) built a model that decomposes aggregate growth in the economy into its sectoral components. The effect of sectoral growth is then estimated by:

$$dP = a + \sum_{k=1}^{n} b_k H_k y_k + c_n$$

where H_k , k = (1, 2, 3, ...n) represents the ratio of output in sector-k to national output, y_k denotes the growth in sector-k, and P denotes the incidence of poverty. From the equation, we can expect that positive value of parameter *b* means that the growth in sector-k correlates with increase in poverty incidence.

2.2.5.2 The Empirical Study of Sectoral Composition and Poverty

Some empirical results have supported the idea of the significant contribution of agricultural growth to poverty reduction (Thurlow and Wobst 2005, Warr 2006, Suryahadi 2009, Zaman et al. 2010). Research by Suryahadi et al. (2009) investigated how sectoral composition affects poverty alleviation in Indonesia. In the research, they decomposed data of growth and poverty by location (rural and urban) and sectoral composition. The data was acquired from the National Socio-Economic Survey on consumption expenditures. While for sectoral composition growth, the study utilized Gross Domestic Regional Product from 1984 to 2002 at 1993 constant market prices. Suryahadi and the team found that to reduce poverty level; some sectors have been successfully lessening the percentage of poor people, while the others were not. They revealed that reducing poverty in rural areas has to be focused on increasing growth in the urban service sector and rural agricultural sector. Between those two regions, growth in urban service sector had a higher magnitude of poverty than the rural agricultural sector. Meanwhile, when it came to urban poverty, maintaining urban services sector always to grow was believed to be the best way to reduce poverty level.

Thurlow and Wobst (2005), in their article, exhibited some experiences in Zambia into research which investigated how the structure of growth could deliver the change in poverty reduction. Initially, they suspected that in the 90s, when the statistic report showed the increase rate of poverty, the distribution of each sector on poverty entirely remained unclear. They found that in the earlier period, the increase rate of agriculture sector had led the growth in the earnings of rural people, especially among poorer household; thus, eventually, it reduced the incidence of poverty. In that sense, they believed that the composition of

economic growth was decisive and; therefore, could change the policies of the government to alleviate poverty. In the late 90s, led by the industrial sector, Zambia might have changed the distribution of income which in turn increased the poverty rate.

Aware of the situation, they later built a model using the dynamic computable general equilibrium (CGE) to find out how the structure of growth would affect the distribution of income to tell which sector that had a greater effect on poverty reduction. The finding showed that agriculture sector had been more pro-poor growth compare to another sector mainly industrial sector in Zambia. It supported what had been suspected by the authors that the share of agriculture sector generated greater influence in poverty reduction through increases in employment and the people's income, especially those who were poor. In other words, the poor population was more involved in the development process when growth was focusing on the agriculture sector. Another sector like industrial sector has proven to be less effective in term of shifting up the poor above the poverty line in Zambia case. The result suggested that growth in aggregate is necessary for reducing poverty. However, if the growth can be focused on the pro-poor sector, then the magnitude of poverty reduction will be higher.

Warr (2006) has investigated how sectoral composition could affect poverty incidence, in Southeast Asia. He found that poverty reduction in four countries in Southeast Asia – Indonesia, Malaysia, Thailand and the Philippines is strongly correlated with aggregate economic growth, while the impact of changes in sectoral composition on these countries is less than total growth. Among the three sectors investigated, agriculture and services were the sectors that have a significant effect on poverty reduction, but not with the industrial sector. From the four countries, only Indonesia whose agricultural sector gives a greater impact on the reduction of poverty than the service sector, while for the others, the results were opposite.

A study by Zaman et al. (2010: 305) found that there was strong linkage among three variables, namely rural poverty, agriculture growth, and income inequality in Pakistan. Using time series data from 1964 to 2006, they analyzed the data set using Poverty Bias of Growth (PBG) method developed by McCulloch and Baulch (2000) to determine the effect of agriculture growth on reducing the poverty rate. The result confirmed that agriculture sector had influenced a significant decline in the number of poor people. Through decomposition process to break down whether the decreasing poverty rate is more affected by economic growth or inequality mechanism, it can be concluded that the greater change in average income has influenced more than agricultural growth to poverty rate. They also found, while in certain periods the growth can be regarded as a pro-poor bias of growth, the other periods

remain anti-poor bias of growth. They summarize that the agriculture sector growth has not been pro-poor growth since anti-poor bias of growth has reduced the effect of economic growth on the poverty rate. To reduce poverty effectively, the policy conducted by the government to alleviate poverty need to consider the importance of income distribution.

Although some articles above have affirmed agriculture as a spearhead of economic growth to combat against poorness, it does not necessarily mean that the other sectors do not have a role in the economic development. A study by Hasan and Qubria (2004), for instance, has revealed that eradicating poverty in the certain regions, like East Asia, correlates with the growth of manufacturing sector. Still, the success of poverty reduction in some areas, for example, South Asia and Latin America, is significantly influenced by agriculture growth.

2.2.6 The Measures of Pro-Poor Growth2.2.6.1 Measure of Pro-Poor Growth using GIC

GIC pro-poor growth method was initially introduced by Ravallion and Chen (2003), which was further developed by Ravallion (2005). In their view, it was the poor or; furthermore, the poorest that have to be targeted as benefit recipients of growth. Thus, it allowed them to catch up the richest, a small number group of people who are mostly enjoying the biggest slice of cake in the economy. In other words, the method considers the distribution of incomes among the population because when the benefits of growth are not well distributed to society, inequality will go up, and poverty will be worse.

This method is analyzing the shape of a curve generated from the change in income or expenditure level between two periods of time, then concluding whether or not growth is already pro-poor. The vertical axis of the curve represents growth in revenue or expenditure level, while the horizontal axis represents percentile of the population. As a basis to determine whether each percentile has already enjoyed benefits of growth, the curve is equipped with a line which represents the mean of consumption expenditures or incomes among the population. If the curve intersects the line of mean income or mean expenditure from the top left to the bottom (downward sloping), it can be concluded that economic growth is pro-poor and vice versa, if not (upward sloping) then not pro-poor.

GIC method has an advantage since it can indicate changes in income inequality between the poor and non-poor. If GIC is a downward sloping, it means that income inequality also decreases. Conversely, if GIC is an upward sloping, the distribution of income is getting worse. Aside from its advantage, if the curve does not take the shape of either downward

sloping or upward sloping, then we could not conclusively determine whether or not growth is already pro-poor.

2.2.6.2 Measure of Pro-Poor Growth using PPGI

Another study that examined the relationship between poverty, economic growth, and inequality based on PPGI approach was proposed by Wodon (1999). He used regional panel data to identify the influence of economic growth on income inequality, the effect of economic growth and inequality on poverty, and the effect of economic growth on poverty.

The first model that examines the effect of growth on inequality can be described as follow:

$$\log G_{it} = \alpha + \beta \log Y_{it} + \alpha_i + \varepsilon_{it}$$

G represents Gini ratio, Y represents mean level of consumption, α_i represents fixed or random effect for district level, and parameter β represents elasticity of income inequality to economic growth.

The second model that examines the impact of growth and inequality on poverty as follow:

$$\log P_{it} = \omega + \gamma \log Y_{it} + \delta \log G_{it} + \omega_i + \varepsilon_{it}$$

 P_{it} represents poverty for region *i* at time *t*, parameter γ represents the gross elasticity of poverty to growth when inequality stays constant, parameter δ represents the gross elasticity of poverty to income inequality when growth rate is constant, and ω_i represents fixed or random effect.

Since the model has already estimated the parameters β , γ , and δ , we now can determine the net elasticity of poverty to growth λ by:

$$\lambda = \gamma + (\beta \delta)$$

Alternatively, by estimating:

$$\log P_{it} = \varphi + \lambda \log Y_{it} + \varphi_i + \varepsilon_{it}$$

Parameter λ is the net elasticity of poverty to economic growth when inequality changes. The net effect of growth on poverty reflects the indirect influence of economic growth on poverty through inequality.

PPGI offers several advantages when measuring pro-poor growth. Some of the benefits are as follow. First, the requirement for data set is not too difficult. Therefore, it is easier for us to measure pro-poor growth. Second, the index can be used to formulate pro-poor policies at

macro and micro levels. Third, the index can be calculated by economic sector or region (Kakwani and Pernia 2000: 13).

Chapter 3 Research Methodology

Based on the objectives and research questions, this study attempts to provide some data and particular econometric model so that the conclusion can be effectively drawn in the process. We collect all of the data from several institutions which have authority to publish some economic indicators used in the model. Meanwhile, the econometric models refer to the theoretical framework and empirical studies built to answer research questions.

3.1 Data

All the variables which become the focus of the research are economic growth, proxied by Gross Regional Domestic Product per capita at constant market price 2000, inequality proxied by Gini ratio, and poverty proxied by Headcount Index or P0. The study uses an interaction variable between economic growth and inequality in explaining how these two variables affect poverty. Moreover, some control variables used in the model are government spending in education and health and sectoral composition which consist of three sectors in the economy, agriculture, manufacturing, and services. The study is based on the secondary source of data at the regional level (regency and municipality) in Indonesia obtained from some various reports of Indonesian Statistic and Directorate General of Fiscal Balance for the period of 2005-2013. Meanwhile, the data used for estimating Growth Incidence Curve is calculated from per capita expenditure based on the National Socio-Economic Survey in 2005 and 2013 published by Indonesian Statistics. The summary of data used in this study is presented in Table 1.

No.	Variable	Proxy	Source	Publisher
1.	Poverty	Headcount Index	Data and Information of Poverty 2005-2013	Statistic Indonesia
2.	Economic development	GRDP per capita	GRDP of Regencies and Municipalities in Indonesia 2005-2013	Statistic Indonesia
3.	Inequality	Gini ratio	National Socio-Economic Survey 2005-2013	Statistic Indonesia
4.	Government spending	Education and health spending	Annual Report of Regencies and Municipalities in Indonesia 2005-2013	Directorate General of Fiscal Balance – Ministry of Finance
5.	Sectoral composition	Agriculture, manufacturing, and services sector	GRDP of Regencies and Municipalities in Indonesia 2005-2013	Statistic Indonesia
6.	Consumption per capita	Consumption per capita	National Socio-Economic Survey for the year 2005 and 2013	Statistic Indonesia

Table 1 Data Sources

The operational definitions of each variable in the study will be discussed in the next section.

3.1.1 Poverty

To measure the level of poverty within a country, what we should think first is identifying the poverty line. The term of poverty used in the study refers to absolute poverty. It means some people who are below the poverty line or below the minimum standard for being able to function in daily life.

The proxy of poverty in the model is Headcount Index, published by Indonesian Statistic, based on data from National Socio-Economic Survey. The method to measure poverty line is called the Cost of Basic Need Method, a method that requires "households to meet their basic needs of food and essential non-food spending" (World Bank 2005: 54).

According to the method, the poverty line is a sum of food poverty line and the non-food poverty line. Food poverty line is defined as the amount of minimum food to get adequate nutrition which is 2100 Calories per person per day. Once the minimum food is set, the next step is estimating the cost to satisfy the minimum requirement. After obtaining the lowest cost of food, the next step is assessing the non-food poverty line. It includes housing, clothing, education, and health that must be fulfilled by every individual. Using the poverty line, the individuals whose average expenditure per capita is below the poverty line can be categorized as poor people. Then, the class of poverty measures is estimated by the method proposed by Foster, Greer, and Thorbecke (1984):

$$P_{\alpha t} = \frac{1}{N_t} \sum_{i=t}^{N_t} \max[(1 - \frac{y_{it}}{z})^2, 0]$$

" y_{it} is consumption expenditure of the *i*'th person at date t in a population of size N_t , *z* is the poverty line, and α is a non-negative parameter" (as cited in Ravallion and Datt 2009: 6). When $\alpha = 0$, $\alpha = 1$, $\alpha = 2$ the measures are called the Headcount Index, the Poverty Gap, and the Poverty Gap Index respectively.

Data on poverty in Indonesia uses household expenditures to measure the poverty line. Therefore it has several advantages over the income-based poverty line. First, households are usually less aware on their incomes than their expenses. Second, household welfare is directly related to spending levels, not to income. Thus, the measure can explain more on economic changes (Warr 2006: 282; White 2014: 62).

3.1.2 Economic Growth

Ravallion (2004) said that both household incomes and expenditures obtained in the same survey for calculating poverty line or Gross Domestic Products could be used as a proxy for economic growth. By using GDP, he further explained that the advantage is that the economic growth can capture many more categories of income or consumption than just household income or consumption. This study uses GRDP per capita to find the effect of economic growth on poverty. GRDP per capita represents the average income of the population. Therefore, when individuals can increase their earnings, we can expect that the poverty level can be diminished over time.

3.1.3 Inequality

Inequality reflects how far the distance between the poor and the rich. Warr (2006: 3) states that the term of relative poverty and inequality (distribution of income) can be interchangeable. Changes in economic size can alter the distribution of income to get better or to get worse. The measure of inequality in the model uses Gini ratio. Indonesian Statistic uses expenditures data of National Socio-Economic Survey to calculate inequality which is the same data to measure poverty.

3.1.4 Interaction Variable between Economic Growth and Inequality

The interaction variable between growth and inequality in the model refers to study by Bourguignon (2004). He stated that the relationship between economic growth and inequality to poverty reduction is not merely like two separate arithmetic relationships. Instead, the interaction between economic growth and inequality does exist and influences poverty

alleviation. His argument is based on some findings in microeconomic-based research which indicates the correlation between economic growths on income distribution (Ibid.).

3.1.5 Government Spending in Education and Health

Government expenditures on education and health in the model is the total amount of payment specifically allocated to finance various activities in education and health. The activities include operational costs, wages for staff, and transfer for social protection. Due to the lack of available data, here, the variables will use the total amount of expenditure.

3.1.6 Sectoral Composition

Sectoral composition in the study shows the percentage contribution of each sector in producing goods and services to national account. Sectors used in the model include the agriculture sector, manufacturing sector, and service sector.

3.2 Descriptive Statistic and Correlation Matrix

3.2.1 Descriptive Statistic

Table 2 summarizes the statistical description of all variables in the study.

Variable	Obs	Mean	Std. Dev.	Min	Max	
P0	4,239	16.212	9.75	1.33	54.950	
grdppercap	4,452	8,182,486	12,500,000	387,474	217,000,000	
gini	4,238	0.295	0.054	0.072	0.566	
agriculture	4,454	0.328	0.192	0.0002	0.942	
manufacturing	4,454	0.122	0.145	0	0.942	
services	4,454	0.127	0.073	0.0029	0.482	
health	3,320	70,100,000,000	76,000,000,000	1,050,000,000	1,950,000,000,000	
education	3,312	219,000,000,000	239,000,000,000	101,000,000	5,550,000,000,000	
grdp_gini	4,238	4.596	0.920	1.033	9.702	

Tal	ble	2	Descr	iptive	Statistics
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We can see from table 2 that the gap between the lowest and the highest of some variables like GRDP per capita and government spending on health and education is quite enormous. The difference can be easily understood by giving the size of the economy between the 'established' and 'underdeveloped' regencies or municipalities in Indonesia. What is needed to be noticed here is that there were some regencies with no contribution of manufacturing sector to the total output regionally. Those regions mostly depended on agriculture sector as their primary sector in the economic activities.

3.2.2 Correlation Matrix

One of the problems in multiple regression models is the presence of multicollinearity among the independent variables. Table 3 below represents the correlation among the variables used in the model.

			Table 5 Co	Stretation	Mainx			
	grdp	gini	grdp_gini	health	educ	agric	manuf	service
grdp	1.00							
gini	0.22	1.00						
grdp_gini	0.44	0.97	1.00					
health	0.21	0.19	0.23	1.00				
educ	0.15	0.20	0.23	0.56	1.00			
agric	-0.57	-0.30	-0.41	-0.22	-0.18	1.00		
manuf	0.38	0.10	0.18	0.21	0.16	-0.49	1.00	
service	-0.37	0.05	-0.05	-0.12	-0.06	-0.00	-0.39	1.00

Table 3 Correlation Matrix

Note. educ: education; manuf: manufacturing

3.3 Methodology

The study uses panel data analysis to examine the links between poverty and economic growth, inequality, interaction variable of growth and inequality, government spending, and sectoral composition. Panel data is a combination of cross section and time series data. Cross section means that the data are collected from some objects at the same period; whereas, time series means the opposite, one object but in the variety of time. Therefore, the use of panel data model can deliver more comprehensive results than a cross section or time series. Moreover, it can increase the number of observation; so that, it enlarges the degree of freedom and also lowers the probability of linear relationship among independent variables in the model. In other words, the estimation result of panel data will be better than either cross section or time series data.

Baltagi (1995:7) has summarized some advantages of the using panel data in econometric analysis compare to two other types of data; time series and cross section data. First, panel data can control heterogeneity among the individuals. Heterogeneity cannot be controlled by time series or cross sector; thereby, resulting in a risk of bias in the estimation results. Second, panel data can provide more information, more variation, and higher degrees of freedom, while at the same time can lower the problem of co linearity. Third, panel data can provide a better understanding of the dynamic changes in the observed variable. Fourth, panel data are better in calculating effects of independent variables to a dependent variable that may not be detected, either by time series or cross section. Fifth, panel data fit to build behavioral models which are more complicated than using a cross section or time series.

3.3.1 Model

The research investigates whether or not Indonesia has been already pro-poor during the periods 2005-2013 by two different methods, namely Growth Incidence Curve (GIC) and Pro-Poor Growth Index (PPGI).

3.3.1.1 GIC

The study uses the model developed by Ravallion and Chen (2003: 95) and Ravallion (2005: 21) which can be represented as follow:

$$g(p) = \gamma + dLn(L'(p))$$

γ	:	$dLn(\boldsymbol{\mu})$ that is the growth rate of mean consumption expenditure
L'(p)	:	first derivative of Lorenz function
g(p)	:	GIC

This method analyses the movement of the growth of mean consumption per capita across the p-percentile of the population, and then we make a conclusion whether the poor have received more benefits than non-poor in the economy. The process to measure GIC is as follow:

- Calculating the mean consumption per capita of the population obtained from the National Socio-Economic Survey in 2005 and 2013 which cover all of regencies and municipalities in Indonesia.
- b. Adjusting data to be comparable to time and region.
- c. Sorting the percentile distributions of expenditures from the lowest percentile to the highest percentile in each year.
- d. Calculating the growth of mean consumption per capita for each percentile by using geometric growth formula:
$$r = \left[\frac{p_{2013}}{p_{2005}}\right]^{1/n} - 1$$

where r = growth, $p_{2005} = \text{mean}$ consumption per capita year 2005, $p_{2013} = \text{mean}$ consumption per capita year 2013, and n = 8 (2013 - 2005 = 8)

e. Calculating mean growth using software Microsoft Excel.

3.3.1.2 PPGI

In this method, the study refers to the model proposed by Wodon (1999) which has calculated the impact of economic growth and inequality to poverty in Indonesia. However, this study modifies the basic model by adding some determinants which theoretically and empirically can affect poverty; so that, the results provide a better understanding of the performance in poverty reduction during observed periods.

The model can be described as follow:

$P0_{it} = \omega + \gamma \log Y_{it} + \delta G_{it} + \theta (\log Y_{it} * G_{it}) + \phi_1 logeducation + \phi_2 loghealth$
$+ \Omega_1 a griculture + \Omega_2 manufacturing + \Omega_3 service + \omega_i + \varepsilon_{it}$

:	Headcount Index (the percentage of poor people)
:	GRDP per capita at constant price 2000
:	Gini ratio
:	the amount of government spending in education
:	the amount of public spending in health
:	the ratio of output in the agriculture sector to GRDP of regency or municipality
:	the ratio of production in the manufacturing sector to GRDP of regency or municipality
:	the rate of output in the service sector to GRDP of regency or municipality
:	intercept (fixed/random effect for district-i)
:	error term
:	cross section - regencies/municipalities
:	time $-t$
	· · · · · · · · · · · · · · · · · · ·

In the model, γ is a parameter of the log of GRDP per capita, δ is a parameter of Gini ratio, and θ is a parameter of the interaction between the log of GRDP per capita and Gini ratio. By using interaction variables, the effect of economic growth or inequality on poverty also depends on the interaction between the two. Furthermore, the parameters of ϕ and Ω represent how the changes of other explanatory variables could affect poverty incidence. Furthermore, ϕ_1 represents the parameter of the log of education spending, ϕ_2 represents the parameter of the log of health spending, while Ω_1 , Ω_2 , and Ω_3 represent the parameter of sector shares in agriculture, manufacturing, and services to GRDP respectively. The sign of those parameters can be either positive or negative depends on their influence on poverty. When the sign is positive, then the variable has a positive link to poverty incidence. However, when the parameter sign is negative, the variable has been a success in influencing poverty reduction.

To see how all variables on the right side of the model have affected poverty, we analyze the best model meant for panel data set, namely common effects, fixed effects, and random effects model. Nonetheless, since the study refers to the work by Wodon (1999) which used fixed and random effects in his estimation, the study; therefore, selects which one between fixed and random effects that is best to answer the research question. The Hausman specification test is then performed to choose between fixed and random effect.

However, the selection of the best panel data model between fixed effect and random effect can also be made with non-statistical considerations. Non-statistical consideration used here is by comparing the number of individual or cross section unit and time series unit. It is said that when panel data set has time series unit less than cross section unit; then random effect model is better. However, when time series unit is more than cross section unit, then fixed effect model is better (Baltagi 1994, Nachrowi and Usman 2006).

Chapter 4 Analysis of Empirical Result

4.1 Growth Incidence Curve (GIC)

GIC is used to determine the extent to which economic growth has provided benefits to the poor. The economic growth can be called as pro-poor when GIC shows downward sloping from the lowest percentile to the highest percentile. It means that the poorest have increased their income or expenditures more than the richest population. Meanwhile, growth in the economy is not pro-poor if GIC shows upward sloping or the growth rates increase monotonically from the lowest percentile to the highest percentile. In other words, those who are in the highest percentile receive more benefits of growth than the people at the lowest percentile. However, when the curve does not take the shape of either upward or downward slope, we cannot indicate whether growth is pro-poor or not.



Figure 5 Growth Incidence Curve

Source: STATA Computation and Microsoft Excel 2013

This study, meanwhile, has divided population into 100-percentile which reflects the distribution of expenditures by different households ranked to their consumption level. From 2005 to 2013, according to Figure 5, growth in mean consumption per capita was positive for all percentiles, indicating that the entire population had experienced increasing expenditures. From the GIC, it also can be concluded that "there is first order dominance, which implies that poverty has fallen no matter where one draws the poverty line or what poverty measure one uses within a broad class" (Silva 2016: 1286).

However, it can be seen that the bottom 20% percentile only experienced an increase in consumption with a value less than the mean growth, while the top 20% percentile enjoyed increases in consumption more than the average growth of consumption expenditures. In general, the slope of curve implies rising inequality over the period of 2005-2013 since the households in the top consumption percentile had a higher growth rate of consumption than the poor. Because the poorest still only experienced lower growth rates of consumption than the average growth of consumption, we could not claim that economic growth of Indonesia was already pro-poor during the observed periods.

While at the national level, Indonesia's growth cannot be called as pro-poor growth, we can observe that at the provincial level, some of the provinces have already achieved a pro-poor growth. Based on Figure 6, the Province of Bangka Belitung for example, the curve shows a negative slope where the bottom 20 % percentile enjoyed an increase in consumption about 15%, whereas the top 20% percentile experienced only 10% growth of consumption. It means that the large share of benefits brought by the growth went to the poor. Meanwhile, the richest still got the benefits, but in smaller proportion. That is what we expect from pro-poor growth, a growth which favors the poor.

On the contrary, in the case of the province of South Sumatera, it was the top 20% who earns huge share of benefits than the bottom 20%. From the graph, we can see that the poorest only experienced 12% rise in consumption between 2005 and 2013, compared to the richest who enjoyed 16% increase in consumption.



Figure 6 GIC: Bangka Belitung and South Sumatera

Source: STATA Computation and Microsoft Excel 2013

The charts above offer two different stories. The first story is during the period when growth is favorable to the poor. Meanwhile, the second story shows the opposite; it is the rich who take enormous share benefits of growth. Then, we can say that growth in Bangka Belitung is already pro-poor, but in the case of South Sumatera is not pro-poor. The study has calculated GIC from other provinces as well and finds that among thirty-three provinces in Indonesia, seven of them can be considered have achieved pro-poor growth, while twenty-three provinces are not pro-poor yet. Summary of the results is presented in Table 4 (all results of GIC method at the province level will be shown in Appendix 1).

Table 4 Provinces	based	on	GIC
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Type of Growth	Provinces (code)
1. Pro-Poor Growth	North Sumatera (12), Kepulauan Bangka Belitung (19), Kepulauan Riau (21), East Nusa Tenggara (53), East Kalimantan (64), North Maluku (82), Papua (94)
2. Anti-Poor	NAD ¹ (11), Riau (14), Jambi (15), South Sumatera (16), Bengkulu (17), DKI Jakarta (31), West Java (32), Central Java (33), Jogjakarta (34), East Java (35), Bali (51), West Nusa Tenggara (52), West Kalimantan (61), Central Kalimantan (62), South Kalimantan (63), North Sulawesi (71), Central Sulawesi (72), South Sulawesi (73), Southeast Sulawesi (74), Gorontalo (75), West Sulawesi ¹ (76), Maluku (81), West Papua ¹ (91)
3. Cannot be classified	West Sumatera (13), Lampung (18), Banten (36)

Source: Stata Computation and Microsoft Excel 2013

A weakness found in the method is that, sometimes, we encounter a graph which cannot be decided as a curve of pro-poor growth or a curve of anti-poor growth. In Indonesia, three provinces cannot be classified whether they have achieved pro-poor growth or not. They are West Sumatra, Lampung, and Banten. The example below shows that the poorest received high shares of growth as well as the richest.

¹ Due to the availability of the data, for these provinces, we use data from National Socio-Economic Survey in 2006, instead of 2005. However, it does not necessarily mean that the GIC results of these provinces will be the same as if the study uses the 2005 survey (Bridonneau, 2016).



Figure 7 GIC: cannot be classified

Source: STATA Computation and Microsoft Excel 2013

4.2 The Links between Poverty, Economic Growth, Inequality, the Interaction Term, Government Spending, and Sectoral Composition

4.2.1 Model Specification Test

As described earlier, the study will analyze panel data model. For selecting the best model between fixed effects and random effects, the study then undertakes the Hausman specification test. The result shows that the p-value is 0.000. Therefore, we accept the null hypothesis or the fixed effects is a favor to explain the model.

However, if we take a look at the structure of the data set, it consists of 490 individuals (regencies and municipalities) and nine time periods (2005-2013). According to non-statistical consideration, when the panel data set has individuals number more than time periods, we can choose random effects model over fixed effects model (Baltagi 1994, Nachrowi and Usman 2006). Also, using random effects model offers several benefits compared to fixed effects model (Papyrakis, 2012: 126). The first benefit is it can be used to estimate the impacts of time-invariant variables, which are frequently significant predictors. The second advantage is random effects have more efficient estimators when "combining both the 'within' and 'within' variation across observations" (Ibid.). Based on those considerations, the study uses random effects specification to analyze the model.

According to the concept of pro-poor growth, poverty reduction relates to two factors, economic growth and the distribution of incomes among the society. Nevertheless, those factors are not sufficient to explain the changes in poverty level. This study, therefore, engages with other determinants to explore links between poverty and variables like

government spending and sectoral composition. By using all of those variables, the changes in poverty incidence can be estimated better. So, we can find the best possible action to ensure the success of poverty reduction programs.

Independent Variables	Poverty (1)	Poverty (2)	Poverty (3)
constant	83.21	60.47	59.12
grdp	-4.10***	-2.86***	-2.78 ^{***}
	(0.61)	(0.63)	(0.81)
gini	-137.17***	-134.94***	-116.46***
	(24.20)	(23.75)	(28.14)
grdp_gini	8.82^{***}	8.69***	7.58***
	(1.53)	(1.52)	(1.80)
agriculture		13.51***	15.16***
		(3.15)	(2.94)
manufacturing		-7.77	-9.90**
		(5.25)	(4.54)
services		-1.56	-0.14
		(4.26)	(4.52)
education			-0.02
			(0.04)
health			-0.01
_			(0.09)
R^2 overall	0.13	0.23	0.23
(within, between)	(0.58, 0.09)	(0.60, 0.19)	(0.60, 0.18)
Municipal/Regencies	497	490	490
Ν	4,235	4,235	3,286

Table 5 The Estimation Result: Random Effects Model

Robust standard errors of coefficient in parentheses

*, **, *** correspond to a 10, 5, and 1% level of significance. Time dummies included in all specifications.

Table 5 above exhibits the empirical estimation of the model using random effects specification model. Our empirical results reveal that economic growth, inequality, interaction variable between growth and inequality, agriculture sector, and manufacturing share are strongly linked to poverty incidence in Indonesia. According to the estimation result, the effects of economic growth and inequality on poverty depend on the interaction variable, while agriculture sector is associated with increasing poverty incidence. However, manufacturing is related to decreasing poverty rate.

Moreover, when we investigate the model using fixed effects specification, the estimated results are not so much different than using random effects model. Table 6 below shows that the explanatory variables which significantly associated with poverty incidence remained similar to the results of random effects model. Instead of using fixed effects estimation,

however, this study focuses on random effects estimated results to analyze the model based on the reasons given in the previous paragraph.

Independent Variables	Random Effects	Fixed Effects
independent variables	Poverty (4)	Poverty (5)
constant	59.12	47.15
grdp	-2.78***	-1.99**
	(0.81)	(0.80)
gini	-116.46***	-118.00***
	(28.14)	(27.17)
grdp_gini	7.58***	7.68
	(1.80)	(1.74)
agriculture	15.16	12.59
	(2.94)	(3.90)
manufacturing	-9.90**	-12.35
	(4.54)	(5.29)
services	0.14	-7.54
	(4.52)	(5.71)
education	-0.02	0.01
	(0.04)	(0.04)
health	-0.01	-0.00
2	(0.09)	(0.09)
R^2 overall	0.23	0.18
(within, between)	(0.60, 0.18)	(0.60, 0.12)
Municipal/Regencies	490	490
N	3,286	3,286

Table 6 The Comparison of Estimation Result: RE and FE

Robust standard errors of coefficient in parentheses

*, **, *** correspond to a 10, 5, and 1% level of significance. Time dummies included in all specifications

After selecting the best specification to analyze the proposed model, the next step is to determine whether the residuals or errors have the same variance around the regression line (homoscedastic) or not (heteroscedastic). However, since random effects specification has already used Generalized Least Squares (GLS) in the estimation, the problem of heteroscedasticity has been resolved.

The model, meanwhile, has not been free from the problem from multicollinearity problem. Based on correlation matrix in Table 3, there is collinearity between explanatory variables, which is gini and grdp_gini. One technique to solve collinearity between two variables is by omitting one of the variables from the model. However, when omitting one of the explanatory variables, it is often found that the variable is the most important in the model. This condition is called biased specification. Table 7 represents the result of regression after omitting one of the correlated variables.

Independent Variables	RE	FE	RE	FE
independent variables	Poverty (6)	Poverty (7)	Poverty (8)	Poverty (9)
constant	25.17	13.08	25.61	13.51
grdp	-0.62	0.18	-0.65	0.15
	(0.58)	(0.63)	(0.58)	(0.63)
gini	1.43	1.38		
	(1.46)	(1.48)		
grdp_gini			0.11	0.11
			(0.09)	(0.09)
agriculture	15.11***	12.62***	15.11^{***}	12.61***
	2.92	(3.90)	(2.92)	(3.90)
manufacturing	-9.88**	-12.48**	-9.89**	-12.50**
	(4.82)	(5.85)	(4.81)	(5.83)
services	0.22	-7.33	0.26	-7.28
	(4.54)	(5.75)	(4.54)	(5.74)
education	-0.03	0.00	-0.03	0.00
	(0.04)	(0.04)	(0.04)	(0.04)
health	0.00	0.02	0.00	0.00
	(0.09)	(0.09)	(0.09)	(0.09)
R^2 overall	0.23	0.18	0.23	0.18
(within, between)	(0.59, 0.18)	(0.59, 0.13)	(0.59, 0.18)	(0.59, 0.13)
Municipal/Regencies	490	490	490	490
N	3,286	3,286	3,286	3,286

Table 7 The Estimation Result after Omitting Variables: RE and FE

Robust standard errors of coefficient in parentheses

*, **, *** correspond to a 10, 5, and 1% level of significance. Time dummies included in all specifications

Based on Table 7 above, it can be seen that after omitting one of the correlated variables, there are only two sector-specific variables that statistically remain significant in affecting poverty. They are agriculture and manufacturing sector. Regarding this condition, regression analysis in the next section still uses interaction variables in explaining the model.

4.2.2 The Links between Poverty and Economic Growth, Inequality, and Interaction Variable

To what extent economic growth is affecting the incidence of poverty, is also influenced by interaction variable in the model. We present the empirical estimation of those correlations in Table 8. Variable grdp in the model represents the log value of GRDP per capita, while variable grdp_gini represents the interaction of log value of GRDP per capita and Gini ratio. The coefficient of variable grdp is -2,78 at 1% level of significance, while the coefficient of variable grdp_gini is 7.58 at 1% level of significance.

	grdp	gini	grdp_gini
P0	-2.78***	-116.46***	7.58^{***}
	(0.81)	(28.14)	(1.80)

Table 8 The Effect of Economic Growth, Inequality, Interaction Variable to Poverty

Robust standard errors of the coefficient in parentheses.

*, **, *** correspond to a 10, 5, and 1% level of significance. Time dummies included in all specifications.

Note: the coefficients in the table are taken from Table 6 column (4).

By combining variable grdp and interaction variable to see the effect of both variables on poverty, we can calculate partial derivative of P0 with respect to grdp, so that any increases in grdp will always result in decreases P0 denoted by $\frac{\partial P0}{\partial grdp} < 0$. Performing arithmetic computation, we find that if gini < 0.37, as grdp increases, P0 decreases; on the contrary, if gini > 0.37, no matter how much grdp increases, the P0 will always increase. The result indicates that as long regencies and municipalities could keep their Gini ratio less than 0.37, then any increases of grdp will always result a decrease in poverty incidence, while regencies and municipalities with Gini ratio more than 0.37 will likely increase their poverty incidence even though those regions can develop their economy.

Furthermore, we can make an example to illustrate the real condition using available data. Among regencies and municipalities in 2013, regency Memberamo Tengah had the lowest Gini ratio at 0.11, whereas regency Kepulauan Pangkajene was the highest Gini level with 0.48. Let say that both regencies can raise their income per capita by 10%, so that Memberamo Tengah increase its GRDP from 2.53 million rupiahs to 2.78 million rupiahs, while Kepulauan Pangkajene raises its GRDP per capita from 10.35 million rupiahs to 11.38 million rupiahs. Nevertheless, each regency has a different story of poverty reduction. In Memberamo Tengah case, an increase of GRDP per capita by 10%, then the percentage of the poor will decrease by 0.18%. Whereas in Kepulauan Pangkajene case, if GRDP per capita rise by 10%, then the proportion of the poor will increase by 0.08%.

The example above shows that the increase of economic growth will give no benefits to the poor when Gini level is more than 0.37, whereas when Gini ratio is less than 0.37, the poor will get benefits for the increase in economic growth. Also, looking the range of Gini level from 2005 to 2013, it can be concluded that regencies and municipalities with Gini ratio less than 0.36 and greater than or equal to $0.07 (0.07 \le \text{Gini ratio} < 0.37)$, will reduce their poverty incidence as income increases. Meanwhile, regencies or municipalities with Gini ratio greater

than 0.37 and Gini ratio less than or equal to 0.57 ($0.37 < \text{Gini ratio} \le 0.57$), are likely to raise the incidence of poverty despite income increases.

Furthermore, the link between poverty and inequality will be influenced by interaction variable as well. Variable gini in the model represents Gini ratio, and the coefficient is -116.46 at 1% level of significance. We then calculate partial derivative of P0 with respect to gini, so that any increases in Gini ratio will not give adverse impact on poverty alleviation goal denoted by $\frac{\partial P0}{\partial gini} < 0$. Performing arithmetic calculation, we find that if log GRDP per capita < 15.36, as Gini ratio increases, P0 decreases; whereas if log GRDP per capita > 15.36, as Gini ratio increases, P0 decreases; whereas if log GRDP per capita > 15.36, as Gini ratio increases. The critical point at 15.36 indicates that regencies and municipalities with the level of log GRDP per capita below 15.36 (or equals to 4.69 million rupiahs) will still be able to reduce poverty incidence, even when Gini ratio increases. In contrast, regencies and municipalities with the level of log GRDP per capita above 15.36 (or equals to 4.69 million rupiah), an increase in Gini ratio will have a detrimental effect as the incidence of poverty will rise.

We can also make an example how regions which have a different level of GRDP per capita could be affected by increasing Gini ratio. Over nine years, regency with the lowest GRDP per capita was regency Sumba Tengah which had GRDP per capita level in 2008 of 0.39 million rupiahs (log GRDP per capita = 12.87). Meanwhile, the highest average income was municipality Bontang which had GRDP per capita level in 2005 of 217,41 million rupiahs (log GRDP per capita = 19.20). If let say, both regions were egalitarian societies, then any increase of Gini ratio will influence poverty incidence differently. If Sumba Tengah experiences a change from equal society (Gini ratio = 0) to extreme inequality (Gini ratio =1), the region still able to reduce the percentage of poor people by 18.93%. Meanwhile, if Bontang increases its Gini level from 0 to 1, then the percentage of poor people will increase by 29%. By looking the range distribution of GRDP per capita, we can conclude that regencies and municipalities which have GRDP per capita less than 4.69 million rupiahs and greater than or equal to 0.39 million rupiahs (0.39 million rupiahs \leq GRDP per capita < 4.69 million rupiahs) were still able to reduce poverty incidence when Gini ratio increases. Whereas the regencies or municipalities with GRDP per capita more than 4.69 million rupiahs and less than or equal to 217 million rupiahs (4.69 million rupiahs \leq GRDP per capita \leq 217 million rupiahs) will raise their poverty incidence when Gini ratios increases.

Until this point, our model has generated two critical points: GRDP per capita and Gini ratio that can influence the change of the poverty incidence. Therefore we can separate regions with GRDP per capita below or above turning point at 4.69 million rupiahs and areas with Gini level below or above critical point at 0.37. To simplify, we can assume that areas with GRDP per capita less than 4.69 million rupiahs as 'poor' region, while areas with GRDP per capita more than 4.69 million rupiahs as 'rich' region. Similarly, we also assume that areas with Gini ratio less than 0.37 as 'low' inequality, while areas with Gini ratio above 0.37 as 'high' inequality. By combining those types of region, we can divide four different groups of regencies and municipalities in Indonesia. Table 9 will visualize the groups of regencies and municipalities based on the level of income and inequality.

Table 9 Groups of Regencies and Municipalities based on GRDP per capita and Gini Ratio

	Gini < 0.37 (low)	Gini > 0.37 (high)
GRDP per capita < 4.69 million (poor)	(poor, low) or (P, L)	(poor, high) or (P, H)
GRDP per capita < 4.69 million (rich)	(rich, low) or (R, L)	(rich, high) or (R, H)

Regarding the division of the group, we will make a simulation of what will happen if each type of group gets different treatment either changes in the GRDP per capita or Gini ratio. Our simulations in Table 10 will use real data at 2013. When income per capita increases or decreases, it is assumed that the Gini ratio remains constant, and vice versa. From the table, we can see that for the group (poor, low), increasing income per capita, as well as inequality, will reduce the poverty incidence. Then for the group (rich, low), the increase in GRDP per capita and the decrease in Gini ratio will result in a reduction in the number of the poor. Meanwhile, for the group (poor, high), decreasing income per capita and rising inequality will bring benefits because the poverty incidence decreases. For group (rich, high), the decline in GRDP per capita, as well as inequality, will bring down the proportion of the poor.

Table 10 The Simulation of the Changes in GRDP per capita and Gini Ratio to the Percentage of the Poor

Region Type		I	Initial		Increase (Decrease) % of the Poor, when GRDP per capita:		Increase (Decrease) % of the Poor, when Gini ratio:	
-		GRDP Capita million)	per (Rp	Gini	increase by 20%	decrease by 20%	increase by 20%	decrease by 20%
Purbalingga (R)	(P, L)		3.50	0.33	(0.05)	0.07	(0.15)	0.15
Sampang (R)	(P, L)		3.44	0.24	(0.17)	0.21	(0.12)	0.12

Buru (R))	(P, L)	1.72	0.23	(0.19)	0.23	(0.35)	0.35
Blitar (M)	(R, L)	6.08	0.32	(0.06)	0.07	0.12	(0.12)
Kediri (M)	(R, L)	98.53	0.32	(0.07)	0.08	1.47	(1.47)
Sidoarjo (M)	(R, L)	15.72	0.30	(0.09)	0.11	0.55	(0.55)
Banjarnegara (M)	(P, H)	3.86	0.39	0.04	(0.05)	(0.12)	0.12
Boalemo (M)	(P, H)	2.85	0.42	0.07	(0.09)	(0.32)	0.32
Asmat (M)	(P, H)	3.42	0.40	0.04	(0.05)	(0.19)	0.19
Bogor (M)	(R, H)	7.10	0.41	0.06	(0.08)	0.26	(0.26)
Bandung (M)	(R, H)	14.15	0.41	0.06	(0.08)	0.69	(0.69)
Luwu Timur (M)	(R, H)	18.74	0.47	0.15	(0.18)	1.00	(1.00)

Note. R: Regency; M: Municipality

What we can learn from the simulation is that each region has its characteristics related to income level and welfare distribution within the population. Therefore, to maximize the rate of poverty alleviation, those areas need to pay attention to various initial conditions including income levels, Gini ratios, and the relationship between income levels and inequality. By knowing the potential, each regency and municipality have a greater chance to achieve development objective.

4.2.3 The Link between Poverty and Economic Sectors

The study investigates which sector in the economy, namely agricultural, manufacturing, and service sector that has a major role in poverty reduction. From Table 11, it can be concluded that among those sectors, the manufacturing sector is positively linked to poverty alleviation, whereas agricultural sector is negatively linked to poverty reduction during observed periods. The service industry, unfortunately, does not contribute to poverty alleviation in Indonesia.

	agriculture	manufacturing	services
P0	15.11***	-9.88**	0.22
	(2.92)	(4.82)	(4.54)

Table 11 The Links between Poverty and Agriculture, Manufacturing, and Services Sectors

Robust standard errors of the coefficient in parentheses.

*, **, *** correspond to a 10, 5, and 1% level of significance. Time dummies included in all specifications.

Note: the coefficients in the table are taken from Table 6 column (4).

The variable coefficient – agriculture by 15,11 and significant at the 1% level means that agriculture sector correlates with increasing poverty incidence in Indonesia. Our empirical result is contradictive with some studies in Indonesia that agriculture sector has a positive effect on poverty reduction (Warr 2006, Suryahadi et al. 2009). Warr (2006) found that

agriculture sector and service sector were the areas that contribute to poverty reduction in Indonesia using pooled data for the Philippines, Indonesia, Thailand, and Malaysia, while Suryahadi et al. (2009) found that rural agriculture sector has been a success in reducing rural poverty in Indonesia.

One note that we need to underline in this finding is that while agriculture sector has contributed a significant share of output in the economy, but the effect on the poor was detrimental. The impact was exacerbated by the fact that in 2013, about 54.70% poor households in the economy live in the agriculture sector. We can see from Table 12 that the number of low-income families in the agriculture sector was almost nine times than manufacture industry or 2 times than other areas combined. The statistic reveals an indication that in Indonesia, the highest proportion of people who are looking for income in agriculture sector is from a poor household. In a rural area, the percentage of low-income families who work in the agricultural sector is enormous and about three times larger than the proportion of low-income families in other sectors combined. For helping individuals, especially poor worker, the government can establish an instrument to protect farm labor, for instance by setting minimum wage standard or facilitating insurance.

Household Characteristic	Unemployment (%)	Agriculture Sector (%)	Industrial Sector (%)	Other Sectors (%)
1. Poor Household				
■ Urban	15,33	29,81	9,32	45,54
■ Rural	8,70	68,73	4,75	17,83
■ Urban + Rural	11,09	54,70	6,40	27,81
2. Non-Poor Household				
■ Urban	14,13	11,34	12,97	61,56
■ Rural	8,04	53,45	6,10	32,41
■ Urban + Rural	11,14	32,02	9,59	47,24
3. Headcount Index				
■ Urban	7,13	15,68	4,84	4,97
■ Rural	12,34	14,34	9,20	6,68
■ Urban + Rural	9,05	14,58	6,25	5,56

Table 12 The Percentage of Poor Household, Non-Poor Household, and Headcount Indexbased on Source of Incomes in 2013

Source: Calculation and Analysis of Indonesian Macro Poverty in The year 2013 – Statistics Indonesia

While agriculture sector surprisingly had a negative correlation with poverty reduction, the manufacturing sector had a different effect on poverty incidence in Indonesia. The coefficient of variable – manufacturing by -9.88 and significant at 5% level means that manufacturing

industry was strongly related to poverty alleviation in Indonesia. Our empirical result is similar to the finding by Hasan and Quibria (2004: 261) who stated that in East Asia (include Indonesia), growth in manufacturing sector played a significant role in poverty alleviation, whereas in Sub-Saharan Africa, South Asia, and Latin America, the agriculture was an important key to reduce poverty incidence.

Some experts have explained the role of the manufacturing sector as a driver of economic growth and hence very useful in poverty alleviation. Experts like Szirmai and Verspagen (2015: 47) believed that manufacturing sector is more productive than agriculture sector because this area is closely related to the use of technology, which helps in time efficiency to increase productivity. The other reason is that the industrial sector can generate externalities and technological diffusion that is greater than agricultural sector thus promoting growth in the overall economy (Szirmai and Verspagen 2015, Haraguchi et al. 2017).

The success of manufacturing industry is depended on the investment level. The high magnitude of this area to poverty reduction is an indication that through greater investment, Indonesia has bigger chance to reduce poverty incidence. Efforts aimed at increasing the accumulation of capital in this sector could increase the magnitude of poverty reduction. For local government at the regency and municipal levels, one example to increase investment level is to reduce barriers in the business start-up process.

4.2.4 The Links between Poverty and Government Spending in Education and Health

Public expenditure on education and health is a government effort to improve human capital. As human capital increases, individuals will be able to raise productivity in generating revenue. The increasing productivity means that people's living standards will get better and poverty can be reduced. The estimated coefficients for education and health in Table 13 represent how government expenditures in education and health could affect poverty incidence which is negative but not statistically significant. We can imply, thus, government spending in both fields have not been a success in influencing poverty reduction in Indonesia.

	education	health	
P0	-0.02	-0.01	
	(0.04)	(0.09)	

Table 13 The Links between Poverty and Spending in Education and Health

Robust standard errors of the coefficient in parentheses.

Note: the coefficients in the table are taken from Table 6 column (4).

^{*, **, ***} correspond to a 10, 5, and 1% level of significance. Time dummies included in all specifications.

An explanation to justify the phenomena is that because the realized spending in education and health have not been oriented to the outcomes, but are solely for the quantitative matter. As mandated by the Constitution, the annual education budget is allocated 20% of the total government budget. Still, unfortunately, the benefits to the poor are limited. Cited from the World Bank (2013) that from 2006 until 2010, there was an increase in term of access and equity since the poorest consumption quintile could send their 15 years old children to stay longer in school, while the enrolment rate rose from 60 percent to 80 percent over four years. However, World Bank revealed that for the age above 15 years old, the registration rate was quite disappointing for the poorest quintile since the enrolment rate decreased dramatically, while the decreasing rate for higher education was recorded to less than 2 percent.

Another evidence of why those expenditures are not reducing poverty can be explained by the structure of government spending Indonesia. Table 14 below represents the amount of education and health expenditures paid by regencies and municipalities for the year 2009. From Table 14, we can see that the spending on education and health were dominated by salary payments that reach 59,41% and 46,61% of total expenditures respectively. Combined with payments for goods and services, we can obtain an operational cost that takes almost three-quarters of total spending in the current year. Meanwhile, the capital expenditures like for building school or buying equipment only made a quarter of total expenses in the year 2009.

Type of Spending	Education		Health		
	Amount	% of	Amount	% of	
	(million Rupiahs)	Total	(million Rupiahs)	Total	
1. Wages	30.038.521,89	59,41	14.878.152,22	46,61	
2. Goods and Services	7.407.167,42	14,65	8.217.274,47	25,74	
Operational (1+2)	37.445.689,31	74,06	23.095.426,69	72,36	
3. Capital	13.113.052,96	25,94	8.823.967,09	27,64	
Total Spending (1+2+3)	50.558.742,27		31.919.393,77		

 Table 14 Accumulated Spending on Education and Health by Regencies and Municipalities in Indonesia Year 2009

Source: Directorate General of Fiscal Balance – Indonesia

What we learn from the structure of education and health spending here is that regencies and municipalities budget is mostly spent on consumptive activities, not on productive activities like capital expenditures. World Bank revealed that such operational costs on paying wages and teacher certification do not correlate with improvement in the quality of education (Ibid.).

Similarly, we can imply that significant spending in salaries and other consumptive posts in health expenditure would not bring direct effect on improving human capital.

To solve the problem of education spending, World Bank (2013) urged Indonesian's government to improve the performance of expenditures in several ways. First, enhance the quality of fund distribution mechanisms so that the poor can get direct access to education through strengthening the quality of local governments in making decisions and managing resources in an accountable and transparent manner. Second, expanding the quantity of transfer for the poor as social protection, for example providing scholarship and other incentives which can help the poor to access education. Third, improving the education facility and infrastructure (Ibid.). Similarly, all of those recommendations can apply to the health spending as well.

Chapter 5 Conclusion

Economic growth has been recognized to be an essential feature in economic development, especially for poverty alleviation program. Most economists think that growth alone is not sufficient to reduce poverty, but combined with an equitable income distribution, the result will be more efficacious. In the concept of pro-poor growth, the symbiosis between economic growth and a fair distribution of income will ensure the poor to get a larger share of the economic pie. This study wants to check whether or not economic growth in Indonesia has been pro-poor during 2005-2013, a period when the government of Indonesia has implemented some strategies called pro-poor and pro-growth in the National Medium Term Development Plan.

The study employs two methods to measure pro-poor growth in Indonesia, which is GIC and PPGI method. However, we modify the PPGI method here by merely observing the links between poverty and economic growth, inequality, and other determinants based on theory and empirical research. According to the GIC method, economic growth in Indonesia has not been pro-poor for nine years because the increase in consumption of the richest population is still higher than the poorest ones. In other words, the poor only got little benefits from economic growth than those who are not poor. Nevertheless, all percentile in the population experienced positive growth which means that all the individuals have improved their expenditure levels so that poverty has fallen. Furthermore, when investigating the GIC method at the provincial level, we can declare that 7 out of 33 provinces have been already pro-poor, whereas 23 provinces have not been pro-poor. Three provinces cannot be classified to be pro-poor or anti pro-poor because of the poorest and the richest experienced disproportionate benefits from the economic growth.

While the GIC indicates that poverty levels have declined, the PPGI method shows that economic growth, inequality, and the interaction terms between growth and inequality have significantly contributed to poverty reduction in Indonesia. Our empirical result exhibits that among three sectors in the model, the manufacturing industry had accounted for positive influence on reducing the number of poor people, while agriculture is surprisingly related to the increase in poverty in Indonesia. Meanwhile, services sector did not have a significant effect on the incidence of poverty. Our finding suggests that government spending has not contributed in reducing the percentage of the poor.

Regarding the empirical results, a combination of policies that consider the relationship between economic growth, inequality, and interaction variables will generate more optimal results in reducing poverty, especially examining the characteristics of each region in Indonesia. For example, areas with inequality levels are 'low'; then economic growth will always have a positive impact on poverty eradication. In contrast, districts with high 'inequality' level, development programs will be more successful if those regions focus more on the income distribution aspect because this aspect has a greater impact on the incidence of poverty.

The positive effect of the manufacturing sector in reducing the poor means that the local governments need to focus their effort to accumulate the fuel of manufacturing industry, which is an investment. The more the investment level, the more productivity in the economy, which in turn accelerating economic growth and poverty alleviation. Meanwhile, the adverse effect of the agriculture sector to poverty reduction has to be addressed carefully, because the highest proportion of poor people is in this area. In other words, increasing share of agriculture will eventually harm individuals in the sector. For helping individuals, especially poor worker, the government can establish an instrument to protect farm labor, for instance by setting minimum wage standard or facilitating insurance. Furthermore, although public expenditures on education and health have not yet benefited the poor, expenditures in this field have high potentials for improving the quality of human resources that are crucial to development. Some recommendations include improving funding mechanisms, increasing funds for social protection, and improving educational facilities.

This study, however, has several limitations. First, the study employs only the incidence of poverty (P0), but not engage with the depth of poverty (P1) and the severity of poverty (P2). The reason is that reducing poverty incidence is still the primary target of Indonesia's development goal. Thus, a study focusing on the poverty incidence will help policymakers to find the best option to eradicate poverty and to achieve the nation's goal of realizing people's welfare. Furthermore, the study does not capture public investment or government spending on infrastructure since the data are not adequately available at regency and municipal level. We also do not examine some example of social protection mechanism like direct transfer to the poor in the agriculture to analyze their impact on the incidence of poverty. Further research to investigate the effect of social protection may explain the benefits of such mechanism for the poor.

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Appendix 1 GIC by Provinces


































Appendix 2 Random Effects Specification Model

Random-effects GLS regression					of obs =	3,286
Group variable:	Number c	of groups =	490			
R-sq: within = between = overall =	Obs per group: min = 1 avg = 6.7 max = 9					
corr(u_i, X)	Wald chi Prob > c	2(16) = chi2 =	1540.91 0.0000			
		(Std.	Err. adju	sted for	490 clusters	in regmun)
pO	Coef.	Robust Std. Err.	Z	P> z	[95% Conf	. Interval]
grdp gini grdp_gini agriculture manufacturing services health education year 2006 2007 2008 2009 2010 2011 2012 2013	-2.783687 -116.4625 7.579849 15.15677 -9.903554 .1469904 0139711 0236096 1.273438 0048821 -1.497606 -2.931541 -3.595958 -4.412106 -5.038507 -4.918444	.8070839 28.14002 1.803587 2.936869 4.541673 4.528785 .0866033 .0447889 .1527329 .1776013 .2491645 .2689882 .3072616 .3357707 .3564259 .3890095	-3.45 -4.14 4.20 5.16 -2.18 0.03 -0.16 -0.53 8.34 -0.03 -6.01 -10.90 -11.70 -13.14 -14.14 -12.64	0.001 0.000 0.000 0.029 0.974 0.872 0.598 0.000 0.978 0.000 0.978 0.000 0.000 0.000 0.000 0.000 0.000 0.000	-4.365543 -171.6159 4.044884 9.400614 -18.80507 -8.729264 1837104 1113942 .9740867 3529743 -1.98596 -3.458748 -4.19818 -5.070205 -5.737089 -5.680888	-1.201832 -61.30907 11.11481 20.91293 -1.002039 9.023245 .1557681 .064175 1.572789 .3432102 -1.009253 -2.404334 -2.993737 -3.754008 -4.339925 -4.155999
_cons	59.11784	12.60821	4.69	0.000	34.4062	83.82948
sigma_u sigma_e rho	7.567126 2.132575 .92642081	(fractior	n of varia	nce due t	:o u_i)	

Appendix 3 Fixed Effects Specification Model

Fixed-effects	Number of	obs =	3,286			
Group variable	: regmun			Number of	groups =	490
R-sq:			Obs per group:			
within =		min = 1				
between =		avg =	6.7			
overall =		max =	9			
				F(16,489)	=	94.54
corr(u_i, Xb)	Prob > F	=	0.0000			
		(Std. E	Err. adju	sted for 4	90 clusters	in regmun)
	 I	Robust				
pO	Coef.	Std. Err.	t	P> t	[95% Conf.	Interval]
grdp	+ -1.987669	.8025602	-2.48	0.014	-3.564561	410777
gini	-117.9993	27.16824	-4.34	0.000	-171.3802	-64.61845
grdp gini	7.675245	1.742225	4.41	0.000	4.252075	11.09842
agriculture	12.58953	3.895242	3.23	0.001	4.936058	20.24301
manufacturing	-12.34935	5.28647	-2.34	0.020	-22.73635	-1.962356
services	-7.544265	5.711943	-1.32	0.187	-18.76724	3.678715
health	.0017085	.0860209	0.02	0.984	1673077	.1707246
education	.0116893	.0449622	0.26	0.795	0766536	.1000321
year						
2006	1.250158	.1525431	8.20	0.000	.9504377	1.549879
2007	091999	.1785416	-0.52	0.607	4428024	.2588045
2008	-1.606052	.253921	-6.33	0.000	-2.104963	-1.107141
2009	-3.094482	.2762534	-11.20	0.000	-3.637273	-2.551692
2010	-3.842413	.3192317	-12.04	0.000	-4.469648	-3.215178
2011	-4.736596	.3574802	-13.25	0.000	-5.438983	-4.034209
2012	-5.399622	.3869566	-13.95	0.000	-6.159925	-4.639319
2013	-5.32395	.4227661	-12.59	0.000	-6.154613	-4.493288
_cons	47.15061	12.49656	3.77	0.000	22.59703	71.70419
sigma_u	8.9004659					
sigma_e	2.132575					
rho	.94570748	(fraction	of varia	nce due to	u_i)	