

## FACTORS AFFECTING INEQUALITY OF INCOME IN INDONESIA IN THE ERA OF POST ASIAN ECONOMY CRISIS

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### ABSTRACT

*Since inequality of income is likely inevitable in almost all countries, the purpose of this study is to investigate factors that affect inequality of income in Indonesia in the era of post Asian economy crisis. The model proposed in this study was tested by regression using time series data started from 2002 to 2017. The results show that inequality of income in Indonesia is affected negatively and significantly by tourism, ratio of school participation and social protection spent by government. It indicates that those three variables have been well done in spreading out to low income segment. Besides, there is also negative relationship to inequality of income, that is, GDP per Capita, but not significant, indicating this independent variable is not strong enough in affecting inequality of income. Inequality of income is also positively and significantly affected by government spending for infrastructure, indicating spending by government on infrastructure has not been spread out in the entire region of Indonesia. In addition, there are other three dependent variables that have positive relationship to inequality of income but not significant, that is, unemployment, FDI and inflation, therefore it does not give impact on inequality of income. This study is limited only focus on post Asian Economy crisis era, thus for the next study can be researched the period before and during crisis so that comparison among them can be done. Besides, additional variables and panel data using other countries particularly Asian or South East Asia countries can be put into this model in order to enrich knowledge about determinant factors of inequality of income so that government can take action to reduce inequality of income.*

**Keywords:** Inequality of income, tourism, ratio of school participation, social protection, GDP per capita.

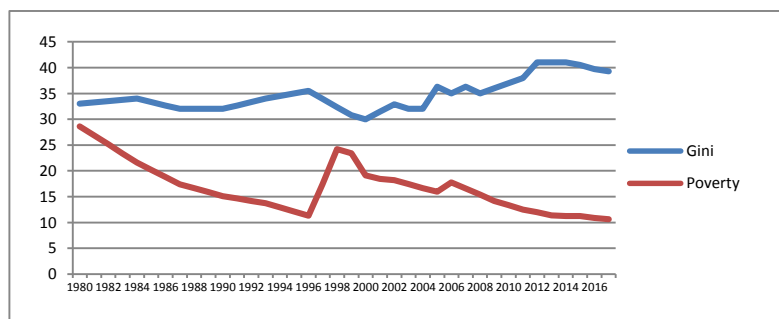
### 1. INTRODUCTION

Inequality of income is one of serious problems in economy that is faced by any nations. According to Todaro and Smith (2009, 826), there is an important issue in economics of development, that is, an unequal income distribution among households. Although mostly suffered by developing countries, but actually it happens also to developed countries. Eradicating poverty as a goal of all countries does not result in income equality. Many problems can arise from the effort of poverty reduction, thus both poverty and inequality of income reduction must get concern by all nations so that welfare is not only enjoyed by the rich.

Indonesia, one of the emerging countries, also faces problem of inequality of income. Although rich with abundant reserves of natural resources that are supported by huge amount of large labor force, Indonesia suffers inequality of income from time to time. Discussion about income distribution is often related to the era before and after Asian economy crisis because that crisis in 1997 – 1999 is a turning point of economy particularly Indonesia that suffered the worst among others. Often Indonesia economy is also compared between Soeharto's era and reformation's era from which Asian economy crisis is deemed as the end of Soeharto's reign and the starting point of reformation's era.

Figure 1.1 shows gini ratio and poverty line in Indonesia, both pre and post Asian economy crisis. Gini ratio indicates low (which is better) in the period until Asian economy crisis while opposite condition happened in the period of post Asian economy crisis. From that picture, it can be concluded that in term of income distribution, Soeharto's era is better than reformation's era. That is why interesting to explore determinant factors of inequality of income in the era of post Asian economy crisis.

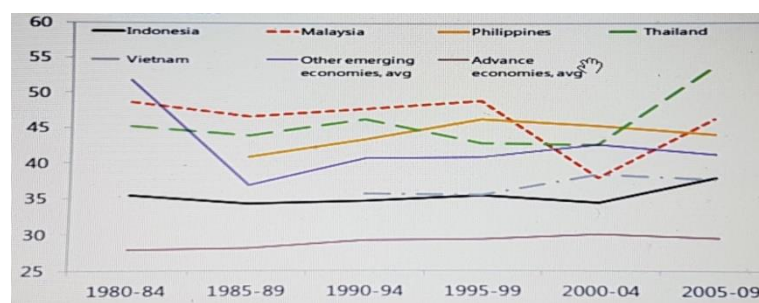
**Figure 1.1 Poverty and Inequality in Indonesia**



On the other hand, the increase of Gini ratio is in line with the decrease of poverty line and vice versa, as shown by that figure. During sixteen years from 1980 until before the starting of Asian economy crisis in 1996, poverty line decreased sharply, indicating that Soeharto's programs were successful in alleviating poverty. However, crisis led to sharply increase poverty line during two years. Fortunately economic crisis could be well tackled and poverty line decreases continuously except for year 2005 to 2006. However, the trend of improvement in poverty line usually is in line with the worsening of income distribution, as shown by Indonesia's picture above, peaked in three consecutive years, 2012, 2013, and 2014, that is, 41%.

However, although inequality of income of Indonesia relatively high particularly after Asian economy crisis, compare to other selected South East Asia countries, Indonesia's gini ratio indicates better, as can be seen in figure 1.2. Besides, Indonesia's gini ratio is also lower than average of other emerging economies in South East Asia.

**Figure 1.2. Gini Ratio among Selected South East Asia Countries**



Source: World Bank, World Development Indicators and Povcal databases; OECD and LIS/EU databases; and IMF staff estimates.

In order to cope with inequality of income problem in Indonesia, it must be revealed the determinant factors of inequality of income. Once the sources of inequality are found, then the appropriate policies can be suggested to cover gap in distribution of income.

## 2. LITERATURE REVIEW

### 2.1. Inequality of income

Todaro and Smith (2009, 826) argue that countries which have high inequality of income caused by unequal income distribution are dominated by greater share of rich people on wealth of country compare to the poorer groups. Ideally, there are four criteria to measure inequality of income accurately and carefully. Firstly, the principle of anonymity; secondly, principle of population; thirdly, principle of relative income; and fourthly the Dalton principle. To fulfill four criteria above-mentioned, Gini coefficient is used to measure inequality of income, thus this study uses it. Study conducted by Kuznets (1955) entitle "Economic Growth and Inequality of income" is believed to have relations with research about inequality of income which studied the savings effects and the shiftment of agricultural to the sector of industry. The study to compare an inequality of income between developed and developing countries were performed to provide a logical and speculative argument. The result shows that levels of income in underdeveloped countries will be more unequal because of share of income disproportionation of the highest income countries. According to Kuznets (1955, 22-23), inequality of income difference happens across different steps of growth of economic.

Since Kuznets' work, researches were conducted subsequently which concerns on the changes in inequality of income, both in case of how it changes throughout economic growth process of a country and to investigate what kind of elements that have an effect on inequality. Deininger and Squire (1996, 565) in his studies by using higher quality datasets than Kuznets' work, reveal that no hard relationship between inequality and growth, instead the fact that there is hard relationships between growth and poverty. Studies that focus on the impact of factors was found blended outcomes when researching a group of countries, since factors can have different effects on inequality of income which depends on the country or group used (Gustafsson and Johansson 1999, 600).

Because of hard effect on an economy, research about inequality of income is of particular importance within the context of emerging countries because they have already had not strong economies and significant poverty rates. Due to inequality of income, inefficiencies of economy in a country occurs, for example, poor people are difficult to get loan in comparison with middle class who has high savings rate; and allocation of assets will not be efficient enough. For instance, the majority of land will be owned by the rich (Todaro and Smith 2009, 223) as well as to facilitate the behavior of rent-seeking that includes cronyism and bribery (Todaro and Smith 2009, 223).

Within Third World countries, there is no consensus about the effect of inequality of income on growth. Some researches have revealed a strong positive correlation between them (Samanta and Heyse 2006, 252) whereas others say that high inequality will decrease growth (Ravallion 1997, 56), therefore resulting a negative correlation. In his study in 1997, Ravallion also indicated that countries whose inequality of income is high enough will obtain less from the growth of economic in terms of poverty eradication as the effect on the reduction of absolute poverty. There is also unclear explanation of the impact of growth on inequality of income. The study reveals that distribution changes of income mostly are not correlated with growth, as about half of the cases of inequality goes up and in the other half, it goes down (Bruno, Ravallion, and Squire 1998, 138).

Many variables have a potential impact on inequality of income that represents these particular categories, that is, economic; demographic; political; cultural and environmental; as well as macroeconomic factors. Kaasa's (2005) argued five factor categories of inequality of income. Firstly, factor of economic that are comprised of the aspect of wealth, growth, and development of an economy of a country. These factors are mostly used for research (Kaasa 2005, 8). Secondly, factor of

demographic that reflects the characteristics of population of a country which cover a wide range from where people live (urban versus rural), education and composition of household. Thirdly, factor of politic that is involve the government role in inequality of income. Fourthly, cultural and environmental factors that involve a wide area of factors which take into account characteristics inherent to the country itself that is able to include the aspects of culture such as traditions and environmental factors (e.g. natural resources). However, in this study, cultural and environmental factor are not included in the independent variable.

Finally, the last, factors of macroeconomic let research about a country within a context of international. The increase of globalization and integration of financial leads to an increasingly necessary category which includes FDI, Inflation, Unemployment, and tourism sector. These five categories let more focused researches, and make it easy to study certain type effect of factors in comparing others.

## **2.2. Economic (Development) Factor - Gross Domestic Product (GDP) per Capita**

In this economic development factor, GDP per capita is used. Regarding research about wealth of a country and inequality of income, most of the studies are related to Kuznets' (1955) hypothesis that state about an inverted U-relationship as the GDP grows. It is said that firstly inequality would increase and then would start decreasing, which is supported by the data about labour force that was shifting from agriculture sector to industry sector. One possible explanation is that inequality of income between sectors is greater than inequality within them, such as, when agricultural sector is less productive, then industrial sector is more productive. Inequality of income increases in the earlier movement of labour force, however then decreases when majority of them are already in the industrial sector or in the other words the shift between the agricultural and industrial sector has balanced return rates in those sectors (Ferreira, 1999b).

In addition to abundant of researches which examine hypothesis of Kuznets, mostly analyses which use various data that cover several factors of inequality of income also included GDP per capita in their analyses. Many analyses support Kuznets' hypothesis. On the other hand, Ram (1997) did analysis of developed countries' panel data for 1951–1992 and had finding of an un-inverted U-curve, that is, the more increasing of the GDP, the more decreasing of inequality of income tha was happened in the 1950s and 1960s, but more increasing from the 1970s on. Similar outcome were concluded by a U.S. counties analysis within similar time (Ram, 1991). Gustafsson and Johansson (1997) in their study about OECD countries in the period of 1966–1994, wealth of a country changed to be not significant as a factor of inequality of income. Thus, the effect of a wealth of a country on inequality of income is not clear.

## **2.3. Demographic Factors - Education**

Education as one of the indicators for the human capital is included in the models. Improved education has high possibility to be a balancing effect on income, distribution and therefore reduce inequality of income within a country. According to Dao (2008, 298) the decrease of inequality of income as it will improve human capital level within a country with a bigger chance for education can be done by the empowerment of education through rate of higher primary school completion, that is, by increasing funding for education provided by government. Less effect on distribution of income will be achieved that in turn will lead to a drop in inequality of income. In this context, school participation rate of high education level is used instead of higher primary school completion rates since both of them have the same nature and purpose, with the same school level and nature. School participation rate is the ratio between the number of people/children who have been registered as student and the number of people/children who must study in accordance with their age.

In a study by Chu (2000) where data from 1966 to 1995 of Taiwan were used, results in elasticity of income share of level of schooling to Gini ratio of -0.789 that means schooling increasing level will reduce inequality of income. Other study by Psacharopoulos and Steier (1988) by using data of 1975 to 1984 from Venezuela reveals that widening of education decreases inequality of income due to more educated people will narrow the earnings differentials.

According to Dao (2008), inequality of income is evidenced to depend on primary school completion rate in a negative linear way, and the relationship between primary school completion rate and income is proven to be statistically significant. His study also argues that primary education expansion lessens inequality of income in developing countries. In other study by Hoeller, Joumard and Koske (2014) to research the relationship between education and inequality of income, the majority opinion is that the accumulation of human capital eases the decrease in income differentiation. It can be explained with the evident that the higher level of education will lead to the increase of qualified labour offering, which in turn reduces the differences in payment. In that sense, results from the regression analysis are expected to be a negative sign.

## **2.4. Political Factor - Construction and Social Protection Spending**

In an effort to eradicate inequality of income, government plays important role. Political factor that can be used for doing it is by allocating fund for social protection and construction for infrastructure spending. The share of government expenditure in the GDP measures the share of government sector in economy with a big number of proporsion that is realized by transfers, such as pensions, subsidies and grants that have a function of balancing and redistributive in community. Therefore, the higher share of government sectors the lower inequality of income. Besides, Gustafsson and Johansson (1997) argue that inequality of income in public sector is usually lower than that in private sector, which is second way in reducing inequality done by sector of government, such as Durham (1999), did analyses the years of 1960–1992, Gustafsson and Johansson (1997) used the years of 1966–1994, Clarke, Xu and Zou (2003) utilized the years of 1960–1995. However, the effectiveness of inequality-reducing influence of government expenditure depends on the share of transfers in total expenditure. The increase of inequality of income

is inevitable if mostly expenditure of government is spent to more welfare people (Xu and Zou, 2000; Clarke, Xu and Zou, 2003).

Other researchers, Blejer and Guerrero (1990) indicate that greater inequality of income was a result of bigger expenditure of government spent to industrial and large projects for which welfare people gain benefit rather than to social insurance. As a consequent, the assumption about the influence that the government sector share can cope with inequality of income is not clear. However, government expenditure share for social protection in the GDP (SOCPROT) is an indicator that reflects the redistribution role of the government regarding household income, and the studies show that the increase in the government expenditure for social protection leads to lower inequality of income, such as Dabla-Norris (et al, 2015); Mihaylova and Bratoeva-Manoleva, (2017). In that sense, it is expected that the regression coefficient will be with a negative sign.

Meanwhile, other political factor, that is, the study about the effect of government spending in construction and infrastructure on inequality of income has not been found. However, logic of thinking should be similar, when both of those political factors are spent for people, inequality of income should decrease, with assumption that the spending are spread out with good distribution. When spending for construction and infrastructure is done in remote and far area, then the spillover effect will run well. Employment rate around that area will increase, micro, small and medium enterprise (SMEs) will develop, access to that area will be much easier, all of which will lead to improve income distribution.

## 2.5. Macroeconomic Factors

In this study, macroeconomic factors have four components, that is, foreign direct investment (FDI), inflation, unemployment, and tourism.

### 2.5.1 Foreign Direct Investment (FDI)

FDI holds important role regarding the increasing openness potential effects to the international market, since liberalism system in trade has widened all around the world. It is almost impossible to avoid this system from economy in any country since globalization is an evitable thing. The degree of openness varies from country to country with which result in different FDI. This fact should be explored regarding inequality of income research so that policy guidance can be provided in facing the flourishing integration of both regional and global markets. The FDI effect on inequality of income should be investigated so that negative effect, if any, can be well mitigated.

Regarding effect of FDI on inequality of income, many researches have been done with the result is, the more FDI often leads to more inequality of income (Kaasa 2005, 23). According to Bandelj and Mahutga's (2010), it was shown that for the first decade of market transition, inequality of income was impacted positively and significantly by FDI. It was also found that the impact of FDI is more significant than that of privatization, one of some variables in their model, as the privatization essential impact weakens due to the inclusion of FDI to the model. Grimalda et al. (2010) also demonstrated that FDI gave impact to inequality of income positively and significantly, but just for New member States of European Union (NMS) as a group while for the grouping of the Commonwealth of Independent States and South Eastern Europe area (CIM&SEE) did not give impact. It was because the differences in the purposes of FDI between these two groups of countries. It is because countries of NMS mainly obtained FDI in the form of investment in sectors of technology-intensive, while the countries of CIS&SEE obtain FDI in the form of more investment in low-technology sectors. In their study, Alderson and Nielsen (1999) argue that based on their model analysis of random effects regression, recommend a strong positive relationship between inequality of income and stock of foreign investment, but on the other hand suggest a weak relationship between inequality of income and the foreign investment flow.

### 2.5.2 Inflation

Inflation is a difficult problem particularly faced by developing countries. Many efforts have been done to minimize inflation. When prices are liberalized in emerging countries, there will be increase in prices as a consequence of the shift from low administered prices to market-clearing prices. To handle budget deficits by money printing leads to the increase in prices, then push up inflation. Even in some countries, hyperinflation levels happened around 1990s (Lavigne 1999, 129) although fortunately rates of inflation have decreased around the 2000s (World Bank 2011c).

There is no common rule about the influence of inflation on inequality of income. Inflation impacts unwealthy people by doing devaluation to fixed nominal incomes such as pensions and subsidies, leading to the increase in inequality of income (Gustafsson and Johansson, 1997; Parker, 1999; Xu and Zou, 2000; Cornia and Kiiski, 2001). The impact of inflation increase on inequality was revealed by the research of the Philippines done by Blejer and Guerrero (1990) and research of Xu and Zou (2000) by using Chinese data. On contrary, some other studies show the opposite result, that is, the decrease of inequality by inflation, conducted by Gustafsson and Johansson (1997) by using different countries panel data, Jäntti (1994), and Johnson and Shipp (1999).

Parker (1998) also demonstrated positive relationship where in the long run inflation will increase inequality. However, some studies have the different result as above-mentioned. For instance, the study of Gustafsson and Johansson (1999) showed that inflation does not lead to statistically significant impact on the Gini ratio, for either estimates of fixed effects or random effects.

When some experts argue about impact of inflation on inequality of income, some others on the other hand demonstrate the opposite result, unclear whether inflation actually has an impact on inequality of income. In addition, Creedy and van de Ven

(1997) revealed from their research of data from Australian stating there is no effect of inflation whatever on inequality of income. Dimelis and Livada (1999), also, emphasized that the impact will subject to the country analysed Therefore, there is no strong assumptions about the impact of inflation on inequality of income.

### 2.5.3 Unemployment

Unemployment is one of serious problems in macro economy, particularly in emerging countries. Regarding inequality of income, many studies have been done to investigate whether or not there is relationship between them. Some argue that the effect of unemployment on inequality of income is not so clear. There is assumption that unemployment gives more effect mainly to lower income people (Gustafsson and Johansson, 1997; Dimelis and Livada, 1999); Empirical analyses indicate that unemployment increase will cause a hike in inequality of income, that is, Jäntti (1994) and Abdel-Ghany (1996) researched U.S. data as well as Sharpe and Zybblock (1997) used data from Canada. Studies showing no influence at all were also done, for example, Johnsson and Shipp (1999) analysed U.S. data, and Gustafsson and Johansson (1997) used different countries panel data.

As a consequent about this issue, since the data of one country at a time have been analyzed by most researches, by means of various international panel data, the impact of unemployment on inequality of income will require more analysis to obtain better conclusion.

### 2.5.4 Tourism

The role of tourism for almost every country in the world is getting more important in contributing to GDP, since international mobility is getting cheaper and cheaper, besides need for leisure increases. However, high contribution to GDP does not mean that people's income is well distributed or in other words inequality of income becomes worse. Therefore, the effect of tourism sector on inequality of income should be studied and explored in order to know which one is reducing inequality of income and which one is the contrary, and then appropriate policy implication can be made for both conditions.

Those conditions may be explained as follows, first, condition when tourism can reduce regional inequality. The areas in which their peripheral are poor, commonly is available abundant tourism attractions, which have tendency to share development far from the central of industry toward a region that is underdeveloped in a country. However, second, tourism sector can widen inequality among regions. The distribution of uneven tourism sector may include one or some tourism-rich core regions. With those two conditions make Krakover (2004) demonstrates that the relationship between tourism and inequality of regional is typical for country, vary from one country to another, as well as subjects to some other factors.

For example in Turkey, Göymen (2000) and Seckelmann (2002) demonstrate their study that inequality in different regions in Turkey is boosted by the development of international tourism, that is, developed location and coastal area get more investments for tourism and more priority policies. That condition makes faster development for same regions and vice versa for others that in turn lead to larger regional inequality. The same case with Greece where larger funds are distributed to higher development of tourism area that in turn broadening gap among region (Liargovas, Giannias, & Kostandopoulos, 2007).

However, contrary condition happens in different situation, that is, the case in Israel Krakover (2004) argues that regional balanced economic development in Israel regarding tourism sector is caused by special situations, that is, the size of the country, government policies and security issues. Similar condition to Israel happens in some other countries such as Spain, Italy, Greece and Portugal. By using model of conditional convergence, Proenca and Soukiazis (2008) demonstrate that regional gaps can be reduced by tourism from international that has a great effect.

## 3. RESEARCH METHODOLOGY

### 3.1. Sample and Data

This research uses data that is obtained all from Statistical Bureau of Indonesia chosen for 16 years ( $n = 16$ ) from the year 2002 to 2017. Some missing data were extrapolated by using formulation provided by Eviews software. Since data transformation is allowed, all data were transformed into first degree differential to obtain fit result of classical assumption, particularly for multicollinearity

### 3.2. Empirical Model

In the econometrics study of determinants of inequality of income in Indonesia, the data for an analysis use time period of 2002-2017. The original empirical model comes from Bratoeva, S (2017), as follow:

$$\text{GINI}_t = \beta_0 + \beta_1(\ln \text{GDP})_t + \beta_2(\text{Serv})_t + \beta_3(\text{FDI})_t + \beta_4(\ln \text{FI})_t + \beta_5(\text{ExpSP})_t + \beta_6(\text{Edu})_t + e_t$$

Where the dependent variable is the Gini coefficient – GINI,  $\beta$  is a free parameter,  $e$  is an error term, and the independent variables are:  $\ln \text{GDP}$  – natural logarithm of GDP per capita;  $\text{Serv}$  – a share of the service sector in gross added value;  $\text{FDI}$  – a relative share of the reserve of foreign direct investment in the GDP;  $\ln \text{FI}$  – inflation rate;  $\text{ExpSP}$  – a share of the government expenditure for social protection in the GDP and  $\text{Edu}$  – gross enrollment ratio in secondary education.



The data were processed using the statistical software product, Eviews - 9. The selected time series and the restricted number of observations lessen the possibilities for applying more complex econometric techniques, and therefore in this study use simple OLS regression. The short time series also leads to restrictions in the number of the independent variables which can be included in the model, that is, eight variables. Therefore, by using the original empirical model as above-mentioned with somehow modification and addition of independent variables (CONSTRUC, TOURISM, and UNEMPLOY), the selected multiple regression model in this study is presented below:

$$GINIt = \beta_0 + \beta_1(D(CONSTRUC))t + \beta_2(D(SOCPROT))t + \beta_3(D(TOURISM))t + \beta_4(D(APM\_13\_15\_))t + \beta_5(D(GDP\_CAP))t + \beta_6(D(UNEMPLOY))t + \beta_7(D(FDI))t + \beta_8(D(INFLATION))t + et$$

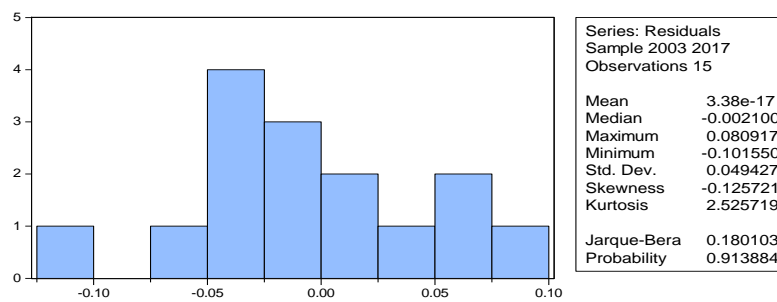
Where the dependent variable is the Gini coefficient – GINI,  $\beta$  is a free parameter, D indicates transformed data using first degree differential, e is an error term, and the independent variables are: CONSTRUC is government spending for construction and infrastructure; SOCPROT is government spending for social protection; TOURISM is total number of tourist visit; APM\_13\_15\_ is school participation rate for high education student level; GDP\_CAP is total GDP per capita; UNEMPLOY is unemployment rate; FDI is foreign direct investment; and INFLATION is inflation rate.

### 3.3. Test of Classical Assumption

#### 3.3.1 Normality of Data

This is important to ensure that in regression model and residual, the data is normally distributed.

Chart 3.1. Normality of Data



From chart 3.1 above, it can be inferred that the data is in normal condition as indicated by score of Jarque-Bera of 0.18, that is less than 2 and probability is 91% that is higher than 5%.

#### 3.3.2 Heteroskedasticity Test

Chart 3.2 Heteroskedasticity Test: White

F-statistic	12.13981	Prob. F(8,6)	0.0034
Obs*R-squared	14.12722	Prob. Chi-Square(8)	0.0785
Scaled explained SS	1.724333	Prob. Chi-Square(8)	0.9883

Based on chart 3.2 above, the value of Obs\*R-squared is 14.127 and probability score is 7.85%, that is slightly higher than 5%, therefore this data is homoscedasticity (not heteroskedasticity).

#### 3.3.3 Multicollinearity Test

This is to test whether there is high correlation among independent variables. If there is high correlation, thus coefficient regression of variable independents cannot be determined and standard error value is infinite

Chart 3.3. Multicollinearity

	D(CONSTR...	D(SOCPRO...	D(TOURISM...	D(APM_13_...	D(GDP_CA...	D(UNEMPL...	D(FDI)	D(INFLATIO...
D(CONSTR...	1.000000	0.391684	0.399660	-0.037365	0.292234	-0.181182	0.155769	-0.075515
D(SOCPRO...	0.391684	1.000000	0.261570	-0.185571	-0.010057	-0.040212	-0.147724	0.007919
D(TOURISM...	0.399660	0.261570	1.000000	-0.165867	0.534239	-0.309281	0.238977	0.170921
D(APM_13_...	-0.037365	-0.185571	-0.165867	1.000000	-0.181057	0.220117	0.075642	0.408534
D(GDP_CA...	0.292234	-0.010057	0.534239	-0.181057	1.000000	-0.700966	0.462565	0.254329
D(UNEMPL...	-0.181182	-0.040212	-0.309281	0.220117	-0.700966	1.000000	-0.595129	-0.212356
D(FDI)	0.155769	-0.147724	0.238977	0.075642	0.462565	-0.595129	1.000000	0.363829
D(INFLATIO...	-0.075515	0.007919	0.170921	0.408534	0.254329	-0.212356	0.363829	1.000000

All data in chart 3.3 above show scores of less than 0.8, indicating there is no multicollinearity among those variables.

### 3.3.4. Autocorrelation Test

Autocorrelation test is conducted to know whether there is correlation among residuals between two periods in linear model. If there is, thus it is autocorrelation problem. Autocorrelation test can be seen from table regression on Durbin-Watson which has the score of 2.48. It is between 2.46 and 2.90, thus not clear whether or not the data has autocorrelation. Score result should be between 1.54 and 2.46 in order to be free from autocorrelation.

All classical assumptions except autocorrelation have been satisfied. However the score indicating autocorrelation shows very slight between 2.48 and 2.46, therefore next process can be continued.

## 4 EMPIRICAL RESULTS

In general, inequality of income in the period of before and after Asia economy crisis shows different result where Gini ratio in pre-crisis period shows lower than that in post-crisis period. The programs in Soeharto's reign are acknowledged as more successful than that in reformation era in post-crisis period. It can be seen in figure 1.1 where the trend of Gini ratio after 1998 was going up with the peak were in three consecutive years, 2012, 2013, and 2014, as high as 41%. However, when seen more detail in post-crisis period, there were decrease in the last three years, that is, 40.5%, 39.7%, and 39.3% in year 2015, 2016, and 2017, respectively by which it is under current reign.

Besides, there is unusual poverty line trend, that is, when mostly the direction of poverty line and Gini ratio is in the opposite direction, but in this current presidency in the last three years both of them show the same direction, decrease. Poverty line in those last three years is 11.22%, 10.86%, and 10.64%, respectively. Moreover, the latest information from Statistical Bureau Office is 9.82% as per March 2018, the lowest ever in Indonesia.

**Table 4.1 Regression Result**

Dependent Variable: D(GINI)				
Method: Least Squares				
Date: 08/28/18 Time: 10:03				
Sample (adjusted): 2003 2017				
Included observations: 15 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.106570	0.083501	1.276275	0.2490
D(CONSTRUC)	0.015048	0.004413	3.409983	0.0143
D(SOCPROT)	-0.001766	0.000639	-2.762996	0.0327
D(TOURISM)	-0.074060	0.036210	-2.045290	0.0868
D(APM_13_15_)	-0.456727	0.192112	-2.377395	0.0550
D(GDP_CAP)	-0.007866	0.031475	-0.249905	0.8110
D(UNEMPLOY)	0.036082	0.067760	0.532495	0.6135
D(FDI)	0.003825	0.008602	0.444618	0.6722
D(INFLATION)	0.005250	0.004842	1.084447	0.3198
R-squared	0.775543	Mean dependent var		0.034667
Adjusted R-squared	0.476266	S.D. dependent var		0.104327
S.E. of regression	0.075501	Akaike info criterion		-2.045629
Sum squared resid	0.034203	Schwarz criterion		-1.620799
Log likelihood	24.34222	Hannan-Quinn criter.		-2.050154
F-statistic	2.591392	Durbin-Watson stat		2.485048
Prob(F-statistic)	0.131178			

Referring to the result of above regression, R2 is 0.775, meaning Gini ratio is affected by 77.5% of all independent variables that is considered as good enough since it is more than 50%. From regression result above, it can be seen that among all independent variables, from eight independent variables only four that have significant value, that is, Construc (government spending for infrastructure), Socprot (government spending for social protection), Tourism (contribution from tourism sector), and APM\_13\_15 (school participation rate for high school student level). The other four variables are not significant, that is, GDP\_Cap (GDP per capita), Unemploy (unemployment rate), FDI (foreign direct investment), Inflation, all of which have t-value of less than 1.96 (5% degree of significance).

Among four significant variables, only Construc that has positive sign, while other three are negative as expected before. Negative signs of Socprot, Tourism and APM\_13\_15 indicate that they support the decrease of Gini ratio as expected.

The budget that is spent for social protection (t-value -2.762), lead to the decrease of Gini ratio. Government has successfully spread out fund for assisting people, particularly low income or poor people. Also, this fund has been enjoyed by far regions of Indonesia. The examples of program held by government are: fund for village development, subsidy for national health insurance premium, food social assistance, higher education scholarship for clever but poor students, assistance for commonly elementary,

and high school students, and many more. In 2019, the budget for social protection will be 15% from total GDP. In term of nominal budget, compare to the last five years (previous reign), the number is much higher, that is, 37.3% higher than before. However, the total number of assistance will be nothing if the fund is not allocated and used widely to all around area in Indonesia, including far and remote area because it will not decrease Gini ratio.

Fortunately, based on the result of regression above, clearly it can be concluded that spending for social protection has affected Gini ratio significantly meaning that government has done its job well. Therefore this variable supports lower Gini ratio, indicated by negative sign of regression result, the higher social protection the lower gini ratio. This result is also in line with the study of Gustafsson and Johansson (1997) who argue that inequality of income in public sector is usually lower than that in private sector, which is second way in reducing inequality done by sector of government, appeared in many studies of panel data. Other scholars did research with the same result, that is, Dabla-Norris et al (2015); Mihaylova and Bratoeva-Manoleva, (2017). Tourism (t-value -2.045) sector also contributes to the decrease of Gini ratio, meaning that this sector successfully leads to good income distribution in Indonesia. In some countries, tourism sector benefits only in some certain regions of country, thus only certain people from that certain region get benefit from tourism. But in Indonesia, in the post Asian economy crisis, government has successfully develop tourism in many regions, more spread out, thus people from remote area can also take benefit from tourism.

Facility and infrastructure for tourism sector are developed and constructed in far region, not only in favorite tourism area, thus many tourist, both domestic and international tourists visit those areas. Therefore this variable supports lower Gini ratio, indicated by negative sign of regression result, the higher tourism the lower Gini ratio. This is in line with the study by Krakover (2004) who argues that regional balanced economic development in Israel regarding tourism sector is caused by special situations, that is, the size of the country, government policies and security issues. Similar condition to Israel happens in some other countries such as Spain, Italy, Greece and Portugal. By using model of conditional convergence, Proenca and Soukiazis (2008) demonstrate that regional gaps can be reduced by tourism from international that has a strong influence. Similarly, Soukiazis and Proenca (2008) indicate that capacity of accommodation as a proxy of tourism boosts rate of convergence within Portugal's regions. Similar result also suggested by Seckelmann (2002) and Haddad, Porsse, and Rabahy (2013).

School participation rate (t-value -2.377) gives support to income distribution. In this study, uses only high school student level (APM\_13\_15) due to data limitation. The more people study the more they earn higher income. However, that situation cannot eradicate inequality of income if people who have chance for education are only from certain region. People from remote and far area from city should get better education thus they can earn more money that in turn will decrease inequality of income. After post Asian crisis, in Indonesia government can give better education to people from far and remote area. Therefore this variable supports lower Gini ratio, indicated by negative sign of regression result, the higher APM the lower Gini ratio. This is in line with the study by Dao (2008, 298) who argues that inequality of income is evidenced to depend on rate of primary school completion in a negative linear way, and the interaction between rate of primary school completion and income is proven to be significant statistically. In addition, it is also in line with study by Chu (2000), Sacharopoulos and Steier (1988), as well as Hoeller, Joumard and Koske (2014).

Construc (government spending for construction and infrastructure) has positive sign (t-value 3.409), meaning the more spending for construction and infrastructure, the bigger Gini ratio. Thus, the intention of government to make good distribution of income by spending for infrastructure has not been achieved for the time being. Even, positive sign means the more spending, the more inequality of income. It means spending for infrastructure has not been enough allocated for remote and far area in Indonesia. Although in this current presidency, spending for construction and infrastructure are more compare to previous governments and spread out more widely to the far area since this is as part of his main program, however the impact of this policy has not given enough impact to the Gini ratio. The construction of infrastructure is performed in the area other than Java islands, such as Papua, Kalimantan, Sumatra, etc. that was not well done by previous governments. The examples of infrastructures are high way that is stretched from Central Java to East Java, airports, dams, ports, etc. The most possible explanation is delay effect that is naturally happens. The spillover effect of the construction in all around Indonesia perhaps will decrease Gini ratio in some next year where more people benefit from the construction.

Other four variables are insignificant, that is, GDP Cap (t-value of -0.249), Unemployment (t-value of 0.532), FDI (t-value of 0.444), and inflation (t-value of 1.084). Besides, it is also in line with the study proposed by Gustafsson and Johansson (1997) about OECD countries in the years 1966–1994 revealing that wealth of a country is insignificant as a factor of inequality of income, indicating it is not clear enough about wealth of a country effect on inequality of income.

Inflation and unemployment have the highest t-values which have positive signs, as expected. It indicates that the lower inflation and unemployment rate, the lower Gini ratio. Low inflation may indicate high purchasing power of people for which they can buy more that can reduce inequality of income. Similar explanation with unemployment, low unemployment rate indicates many people have job for which they have income. However, because both of them are not significant, so no more explanation required. This is in line with the study of Gustafsson and Johansson (1999) who showed that inflation does not give impact that is statistically significant on the Gini ratio, for either estimates of fixed effects or random effects. In addition, Creedy and van de Ven (1997) revealed from their research of Australian data that there is no effect of inflation whatsoever on inequality of income. Dimelis and Livada (1999), also, emphasized that the influence is subject to the country analyzed. Therefore there is no solid assumption about the effect of inflation on inequality of income.

Inflation is the same as unemployment which is not significant in effecting inequality of income. Researches that reveal no effect at all were also done, for instance, Johnsson and Shipp (1999) analysed U.S. data, and Gustafsson and Johansson (1997) utilized



different countries panel data. As consequentl, since majority of the researches on this issue have analysed the data of one country at a time, by means of various international panel data, the effect of unemployment on inequality of income would need more analysis to obtain better conclusion.

## 5. CONCLUSION, POLICY IMPLICATION AND LIMITATION

### 5.1. Conclusion

Based on the above discussion, it can be summed up that determinant factors of inequality of income in Indonesia in the post Asian crisis are government spending for infrastructure, government spending for social protection, tourism, and school participation rate for high school student level. Except for government spending for infrastructure, other variables have negative signs, meaning the lower variables, the lower Gini ratio, thus government spending for social protection, tourism, and school participation rate for high school student level give evidence of contribution to the decrease of Gini ratio. However, government spending for infrastructure that is expected to reduce Gini ratio, the result shows it boosts the increase of gini ratio.

As a whole, Gini ratio in Indonesia in post Asian crisis shows better trend. This condition should be retained and if possible can be reduced so that income can be well distributed.

### 5.2. Policy Implication

With the result of regression above, some policies can be proposed in order to help reducing inequality of income. The emphasizing concern will be on the indicators that are statistically significant while insignificant result does not have meaning since they are not proven to be determinant of inequality of income.

#### 1. Government spending for social protection

Although current program is good enough and government has given much aid for this program, in the future the amount can be increased. But more important than increasing the amount, spreading out more balance between near area and far area, between city and village should be performed. Remote areas in the middle of Kalimantan island, Sulawesi island, Sumatera island, Nusa Tenggara islands as well as Papua island need more attention to be given fund for social protection. The variation of social protection may be improved so that more segments of people can be reached.

#### 2. Tourism sector

The improvement of construction and development of facility and infrastructure for tourism sector has two implications. Firstly, if the target is to increase GDP from tourism sector, thus the easiest and shortest way is by building facility and infrastructure on the most favorite tourism destination, such as Bali Island and Lombok Island. It will generate money fast, but inequality of income becomes higher because spillover effect will be enjoyed only by those certain areas. Secondly, however, what government has done for the time being is correct in overcoming inequality of income, particularly in this current reign. The focus is on spreading out development of infrastructure relating tourism in far regions, and this actions should be continued persistently and give more attention to tourism destination in other far areas that have high potential to be developed as tourism destination but have not been touched by current program.

#### 3. School participation rate for high school student level

Since this variable has been proven to be determinant factor of inequality of income, government program for this matter should be kept continuously. The program should be improved not only for high school students, but also for higher education (university) level. Many private universities also have been changed into public universities that have attracted students to apply for those universities which are spread out not only in the cities or capital of provinces but also far area. Subsidy should be given more to poor people and from far areas by giving easier access to get better and higher education, such as by improving universities in far areas (outside Java island), that is, by constructing better building and many facilities so that no need for students from far area come to universities in Java. Also more scholarship can be given to them who are serious in improving their education.

#### 4. Government spending for infrastructure

While government spending for infrastructure gives positive sign, it can have two possible interpretations. Firstly, the effect of the government program has not been felt this time. Secondly, perhaps it is reality that this program is not well distributed. If the case is latter, then government should spread out more widely to far areas, thus the impact of development can be enjoyed by people from far areas that in turn will reduce inequality of income.

### 5.3 Limitation and Suggestion for Future Research

This study uses limited sample and only uses time series regression and limited years. In the future, research can be done by exploring more data from other countries, such as ASEAN so that panel data analysis can be done. Also, the exploration of more relevant independent variables can be used to enrich theoretical implication.

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