



Graduate School of Development Studies

**Regional Inequality of Indonesia in 1996 and 2006:
Quantile Regression Analysis**

A Research Paper presented by:

Raja Amin Hasibuan
(Indonesia)

in partial fulfillment of the requirements for obtaining the degree of
MASTERS OF ARTS IN DEVELOPMENT STUDIES

Specialization:
[Economics of Development]
(ECD)

Members of the examining committee:
Prof. Michael Grimm [Supervisor]
Prof. Peter Van Bergeijk [Reader]

The Hague, The Netherlands
August, 2010

Disclaimer:

This document represents part of the author's study programme while at the Institute of Social Studies. The views stated therein are those of the author and not necessarily those of the Institute.

Inquiries:

Postal address: Institute of Social Studies
 P.O. Box 29776
 2502 LT The Hague
 The Netherlands

Location: Kortenaerkade 12
 2518 AX The Hague
 The Netherlands

Telephone: +31 70 426 0460

Fax: +31 70 426 0799

Contents

<i>List of Tables</i>	<i>iv</i>
<i>List of Figures</i>	<i>iv</i>
<i>List of Appendices</i>	<i>iv</i>
<i>List of Acronyms</i>	<i>v</i>
<i>Abstract</i>	<i>vi</i>
Chapter 1: Introduction	1
Chapter 2: Theoretical Framework	3
2.1. Inequality: Concept and Importance	3
2.2. Households Characteristics and Other Determinants of Inequality	4
2.3. Consequences of Inequality	6
2.4. Regional Inequality: The Measurement is Matter	7
Chapter 3: Data and Variables	10
Chapter 4: Empirical Results	15
4.1. Inequality of Households Income across Regions in 1996 and 2006	15
4.1.1. Financial Crisis	15
4.1.2. Fiscal Decentralization	17
4.1.3. Increasing of Oil Price	19
4.2. Population Structure and Regional Inequality in Indonesia	21
4.3 Regional Inequality in Different Level of Income	25
4.3.1 The Method: Quantile Regression	25
4.3.2. Results	26
Chapter 5: Conclusions	34
<i>Appendices</i>	<i>35</i>
<i>References</i>	<i>43</i>

List of Tables

Table 3.1 Summary Statistic of Variables in 1996	13
Table 3.2 Summary Statistic of Variables in 2006	14
Table 4.1 Share of Area and Population across Regions	21
Table 4.2 GRDP in year 2000 constant price, 2001-2006 (million rupiahs)	22
Table 4.3 Theill Index across Regions, 2001-2006	23
Table 4.4 Human Development Index in each region, 1999-2006	24
Table 4.5: Estimation of Regional gap at the mean and at various quantile	27

List of Figures

Figure 1 Level Analysis of Quantile Regression in Regional Inequality	8
Figure 2 Kernel Densities of <i>lhpcce</i> , 1996 and 2006	11
Figure 3 Price of Gasoline, Diesel, and Kerosene, 1999-2006	20
Figure 4 GRDP per capita in year 2000 constant, 2001-2006	23
Figure 5 Returns to Education	32
Figure 6 Returns to Agriculture	33

List of Appendices

Table A.1 Estimated Coefficient for Equation (1), 1996	35
Table A.1 Estimated Coefficient for Equation (1), 2006	39

List of Acronyms

BPS	= Badan Pusat Statistik-Indonesian Statistic Bureau
DAU	= Dana Alokasi Umum-General Allocation Fund
DAK	= Dana Alokasi Khusus-Specific Allocation Fund
GDP	= Gross Domestic Product
GRDP	= Gross Regional Domestic Product
HDI	= Human Development Index
PAD	= Pendapatan Asli Daerah (Own Revenue)
SUSENAS	= Survey Sosial Ekonomi Nasional-National Socio-Economic Survey

Abstract

Objectives of this paper are to compare regional inequality in 1996 and 2006, to see influence of socio demographic characteristics to this inequality and to observe if the influence of socio demographic characteristics is varied in different level of income. We explain some factors such as financial crises, fiscal decentralization and increasing of oil price may have changed pattern of regional inequality in Indonesia from 1996 to 2006. Specifically we employ quantile regression to examine the influence and its heterogeneity across point of distribution between and within regions in both years. Our finding show socio demographic variables and job sectors are significant to influence the inequality across regions in both years. Smaller difference in the coefficients the returns of the examined variables in this paper confirmed there is a tendency small decreasing of the regional inequality over the periods. Even though these variables are insignificant in all quantile but this findings support our hypothesis that the variables influence the inequality differently in different point of distribution.

Relevance to Development Studies

Previous researches indicate regional inequality has consequence to impede growth and increase social politic instability. Inequality in Indonesia is quite high especially between Java Bali region and the rest of the country. Else, Studies inequality in this country focused mean which did not consider variation across point of distribution. This paper provides analysis in this field

Keywords

Regional Inequality, Quantile Regression, Indonesia

Chapter 1: Introduction

The study and analysis regional economy and its results distribution has always been a topic of great interest in Indonesia. The main reason for this is the high level of diversity in Indonesia. Indonesia has more than 13,000 islands, hundreds of ethnic tribes and cultures and with varied resource and potential abundant natural resource such as oil, plantation and many others. However since 1970s economic activities have been concentrated in Java and Bali and generally in western part of Indonesia¹. Even though economic structure of Indonesia changed from mining centred activity to manufacturing based economy, the situation remained the same. This was because the locus of development was mostly concentrated in particularly Java. The pattern of industry also indicated that regions that are involved in transnational trading such as Jakarta, West Java and Bali, performed better. Second point is that there seem to be no relationship between availability of natural resource and economic improvement. The best example for this is Papua and Aceh. These provinces have abundant resource especially mineral and gas but still they are among provinces that are still back ward. This has led to wide spread disgruntlement among the people of these regions against the central government.

There was hope when Indonesia established fiscal decentralization which created more scope for local governments to enhance the economic potential in their area. However some studies show that improvement in regions is still non conclusive. Suryadarma et al (2006), Resosudarmo and Vidyattama (2006), Akita (2007), and Etharita (2008), among others, find regional inequality in Indonesia tended to have increased. For example, Resosudarmo and Vidyattama (2006) used provincial Gross Domestic Product (GDP) from 1993-2002 and found inequality among provinces in Indonesia was very high. However their study also suggests that there was a conditional growth convergence which means poorer provinces have higher growth compared to richer provinces. But we should take note that oil is among factors that determine the convergence. Thus, we could say this pattern has changed after Indonesia became a net importer of oil since 2003.

Macroeconomic data also show that even ten years after the crisis performance of Indonesia's economy has not returned to pre crises period performance. Prior to the crisis Indonesia was among Southeast Asian Countries that had extremely high growth rate. Alatas and Bourguignon (2005) wrote that in the period between 1980 and 1996 Indonesia had a continuous annual growth of more than 7 percent of Gross National Product (GDP) as a result the households income doubled. But after the crisis, Indonesia just has per year average growth of less than 5 percent and this is the slowest recovery among countries struck by the crisis. A similar phenomenon is also found in regional level. Aziz (2007) reports after decentralization most provinces have lower lev-

¹ See Hill (2008) who discusses about demographic economic Indonesia since 1970.

el of growth compared to pre crises period. In total, it decreased from 8.13 percent in period 1993-1996 to just 4.84 percent in 2001-2006. It worsened due to the crises number of poor people doubled due to rising oil price in 2005 which additional 1.2 percent was added to the existing population of poor people. Such changes in situation affected the income of the people including its distribution across regions.

Considering the above facts we come to the first objective of this paper which is to simply compare regional inequality in 1996 and 2006. By doing so, we can see how many things that changed in Indonesia over this period, such as crises and fiscal decentralization, translated to shift income distribution across region. In addressing this question we use log of household per capita expenditure (*hhpce*) from National Survey of Socio Economy (SUSENAS) that collected annually. In this paper, regional inequality is defined as variations of per capita expenditure between households across regions. We use expenditure as proxy of income because some studies suggest this more appropriate to show the exact wealth of households².

The second objective is to examine to what extent differences in socio demographic population characteristics across regions can explain regional inequality and whether the set of relevant variables and their effects changed over time. The third objective is to analyze the influence of socio demographic characteristics on income and regional income inequality at different points of the income distribution. Addressing this goal we employ quantile regression since this technique can capture variation of income in many point of distribution. This is an advantage of this paper since previous studies mostly rely on mean analysis which only detects inequality variation in average.

The rest of this paper is as follows. Chapter 2 discusses concept of inequality, its determinants and consequences. Chapter 3 presents the data. Chapter 4 present comparison regional inequality in 1996 and 2006 including the possible driver, the effect of population and the returns on inequality, heterogeneity across the income distribution, the method and the regression results. Chapter 6 concludes.

² See, for example, Nguyen et al (2007)

Chapter 2: Theoretical Framework

2.1. Inequality: Concept and Importance

Concept of inequality is about how benefits of economy are distributed among people or regions (Ray 1999). Concept of inequality also can be divided in to three levels as suggested by Milanovic (2004). First is unweighted international inequality. In this level inequality is compared across countries without taking to account their differences in terms of population. This concept simply compares big populous country such as China, India and Indonesia with tiny countries in the pacific and countries like Monaco and Luxembourg in one-one comparison. In the second concept, weighted international inequality, number of population is already counted. However he says the best comparison is if we quantify inequality based on all people in the world as he defines in third concept which is called true world inequality.

Inequality also can be categorized based on the tools that we used for comparison. Ravallion (2004) emphasizes about relative inequality and absolute inequality. In relative inequality comparison is only done between fractions of people's income in a population with overall average income. Thus if income of all population increase in the same amount then the absolute inequality is the same, without taking into account the real gap is already higher. In the contrary, absolute inequality talks about disparity in absolute number. He illustrates the above by stating that if two households get twice incomes than before, their relative inequality is the same but their absolute inequality has already increased.

Why should we be interested on inequality? Ray (1999) provides two reasons. First, philosophical and ethical reasons as humane which argue people should have similar opportunity to get benefit from economy. Second, inequality has functional level, for instance, it may influence other economic indicators such as growth and level of poverty. Quite similar arguments are put forth by Todaro and Smith (2009) in their Economic Development book. They say inequality is not fair and may cause inefficient allocation of economic resources. Inequality may misallocate economy resource since in a higher inequality of a given level of income also means less people who is eligible getting credit from bank. This situation then hinder them from opportunities to get better education, to increase their business and other possibility which is in turn reduce their chances to get higher income. Thus these factors may beget further inequality. If the inequality is very high, there is also a possibility for a country to have lower level of saving. It argues that highest share of saving come from middle classes. Thus, if the level of inequality is high then the proportion of middle class is less and so the level of saving and investment are also low. They also add that inequality may enhance social and political instability. For economy this is not good since it may increase the power and influence of group in a county, either the rich people or the poor in order to get advantage from rent seeking behaviour or populist policies.

If two literatures discussed above have a negative tone about inequality, World Development Report 2009 from World Bank (2009) under title “Reshaping Economic Geography” gives a more positive tone. It argues that economic growth might be different across countries or regions and it thus concentrate development in certain regions and increase inequality, but with economic integration and what it is called as *neighbourhood effect* will give spillovers effect that support convergence in the long run. This convergence will be facilitated by three instruments of the economic integration which are institution, infrastructure and intervention. Infrastructure connects economic centre, institution in the form of supportive regulations and intervention, this is important to give incentive to preferable sector or activity.

This approach is very relevant for Indonesia since in the literature about inequality in Indonesia emphasizes spatial analysis or we say regional inequality. First reason for this is Indonesian people are very diverse. This country has archipelagic form and number ethnicities that populate and create various history and economic performance. The next reason is centralized planning in economic development in pre reform era. Main feature of this policy is central government in Jakarta determine programs to be done and all sub national administrations only apply them. Effects of the policy are clear which western Indonesia especially in Java and Bali have the biggest proportion in the term of economic activities and gross domestic product. Combination of these two reasons had already motivated disappointment that have led to separation such as in Aceh and Papua.

After financial crises boosted reformation in the country, there are many efforts to correct the policy wrapped in local autonomy policy. This policy gives opportunity to local government to create centres of economic activities which then be hoped will be connected to create high economic growth and reduce difference across regions. Even though some studies such as Resosudarmo and Vidyattama (2006) and Aziz (2008) show the results so far do not satisfy but all efforts should be done to improve the policy instead of returning to centralized planning. One of them is by evaluation continuously and the giving policy recommendation needed which is trying to be done by this paper.

Finally, we state concept of regional inequality that we use in this paper. Regional inequality we define as difference level of welfare of households across region. In measuring welfare we use log of household per capita income (*lhpcce*) so this paper use true region inequality to borrow term of Milanovic (2004) and since the incomes are in nominal this paper can be categorized as absolute inequality.

2.2. Households Characteristics and Other Determinants of Inequality

Many literatures have discussed determinants of inequality. For example, Gustafsson and Johansson (1997) examine some determinants of inequality. They find several factors that determine inequality but with different level in different countries. First factor in their table is economic feature such as variation of economic structure. They suggest reducing share of industrial sector in economy lead to higher inequality. This supports argument from Levy and

Murnane (1992) who say movement demand of workers from industrial sector to service sector may increase inequality since many workers in service sectors are paid very high or very low. Second factor is division of labor. It has been mentioned by other studies such as Burtless (1995) who says international trade increase earning inequality and Richardson (1995) who says in US trade has modest role in income inequality. In their study, Gustaffsson and Johansson (1997) find higher share of import of manufactured goods from developing country lead to higher inequality. However they suggest unemployment rate and inflation rate have no influence on inequality.

Third factor is the share of public sector. Gustaffsson and Johansson (1997) find that in a higher public sector will lead to lower inequality. But in this factor they cannot differentiate the force factor i.e. the number of workers in public sector or amount of transfer in social security. In line with this they also suggest share of people involved in trade unions are negative factors for inequality. Finally, the fourth factor in their table is demographic. There are three variables in this factor. Two factors, female labor and share of people in the age group of 65 years or older, has no effect on inequality while share of people less than 15 years old has a positive effect on inequality.

Other determinants are suggested by Davies and Wooton (1992) who say migration across country may also contribute to inequality. Findings of their study are immigration or emigration of factors of production is determinants of inequality and influence would be bigger from migration of skilled and unskilled labor. Their conclusions are immigration and outflow of skilled labor lead to higher inequality while emigration and inflow of skilled labor lead to lower inequality.

Many studies also suggest that household characteristics may have impact on inequality. The main reason for this is that the functions of households as actors make choices and have attitudes that affect economic activities. In classic literatures of economics we remember households supply resources such as labor and land that are needed by firm or market. Another reason is that household has function to allocate outcome of economic activities to certain need and to provide domestic service. Albertini (2008) says this function has already decreased from pre capitalist era because now welfare state and market provide service to domestic needs. However households are still dominant factors in decision making that shape market behaviour.

Another household characteristic that may contribute to inequality is disparity income between male and female³. One of the issues is that female is more likely to be paid low wage jobs such as agriculture or self employed activities than male. This is off course may lead a household with female headed to get a lower income compare to male. In developing country or transnational country there is also a pattern that female receive lower wage in private sector than in public sector⁴. In the case of Indonesia, in the peak of financial crises in 1997-1998 Frankenberg et al (1999) find female are more likely to lose their

³ For example, see Pham and Reilly (2007)

⁴ For example, see Newell and Reilly (2001) and Jurazda (2003)

jobs than male. In more general and longer periods, Larrimore (2009) finds female and male earning was significant to determine level of income in United States. He also says that this factor was substantial increasing the inequality in 1970s, and to decrease it in 1980s and to slower down the raise in 1990s.

Education is another socio demographic characteristic of households that can determine inequality. Among other explanations of this phenomenon we can refer to classic studies of Schultz (1975) and Welch (1970). Schultz suggests that a higher education means a higher adjustment ability of a household to make more efficient production and rise in income. Welch introduces *worker effect* and *allocative effect* of education. Worker effect is marginal return of a more educated worker in a given input while *allocative effect* is knowledge of a more educated worker in allocating source in a more efficient way. After their works most studies agree that a more educated person is more likely to give higher output and thus a higher income. One variant of the debate then moves to whose education should be used in determining income of a household. For example some studies used the average education (Jameson and Lau 1982), only household headed (Fane 1975; and Wu 1977) or both spouse (Huffman 1974). This paper will follow suggestion of Joliffe (2002) who says the most educated between spouses have more influence on the income of the household.

In the context of Indonesia, influence of household characteristics to variation of income was already studied by Sigit (1985) and later Alatas and Bourguignon (2006). In detail, Sigit (1985) illustrates social demographic of household headed such as education and field of work correlates with income of that household. Alatas and Bourguignon (2006) find that socio demographic factors have shaped the income structure in Indonesia during the period 1980-1996. Since the two studies above explore this topic before 1996, this paper will provide the analysis for the next ten years.

How different household structure may contribute to inequality is also important. Objective of such study is to compare how different pattern of households such as structure of age make different regions have similar distribution of income and also how similar household structure could have different pattern in income distribution. Here we should first note that structure of age may also describe the size of household. This indicator is proposing in Indonesian's cases because life expectancy in Indonesia is quite dispersed, generally longer in western Indonesia than in eastern part. We argue this also may contribute to the pattern of inequality across regions.

Difference of the socio demographics characteristics we explained above will influence household income distribution and its spread across regions will form regional inequality. Except from this, the regional inequality also comes from difference of returns of these characteristics to the households in each region. These two aspects then determine final level of regional inequality that we analyze in this paper.

2.3. Consequences of Inequality

In the beginning of this chapter we already said according to Ray (1999) inequality has functional level. In this section we explain this functional level

by arguing consequence of inequality that can influence other economic indicators. First, inequality influence effort to reduce poverty. Many Studies support this⁵. The argument is in a given level of development we should keep inequality stable to make it effective to reduce poverty. When inequality is high in initial period, increasing the level of development will not necessarily lead to reduction in poverty. We can imagine results of the development can only go to non poor people and thus keep the poverty level. On the contrary, in a low level of inequality a small increase in development can lead to lower level of poverty.

The second consequence of inequality is to growth. If role of inequality to poverty level is clear, relationship between inequality and growth remains debatable. Many study find different pattern which can be two way relationships, either negative or positive. In one way, economic growth change structure of economy including distribution of income. On the other hand inequality of income may impede growth. However there are many views in this matter. Clark (1993) and Persson and Tabellini (1994) are among others who argue that level of inequality in the starting point would lead to lower level of growth while Zou (1998) and Forbes (2000), among others, find inequality has positive impact on growth. To reconcile this debate, Ravallion (2001) emphasizes the problem is when we only consider average data of a country. This might be the case in a given growth level inequality and also poverty remain stable in average. However many people have already moved from below poverty level and vice versa. He also suggests we should collect data in a more proper way to get better conclusion about the relationship.

Another consequence of inequality is its relation to interaction between growth and social politic. Alesina and Rodrik (1994) argue that level of inequality influence political consideration to support development growth. Their basic idea is political policy will follow majority people. The majority, in a high inequality, will ask policy that gives them advantage that may be bad for growth such as high level of taxes that they argue would lead to lower level of growth. The conclusion of their study is inequality has negative influence on growth.

These consequences bring us to awareness that we should make an attention to inequality including regional inequality. We consider them in this paper so we hope it can contribute to study about regional inequality in Indonesia and try to give possibility policy recommendations needed. The end of the day we hope we can manage the inequality so we get growth of economy including its productivity to reduce number of poor people.

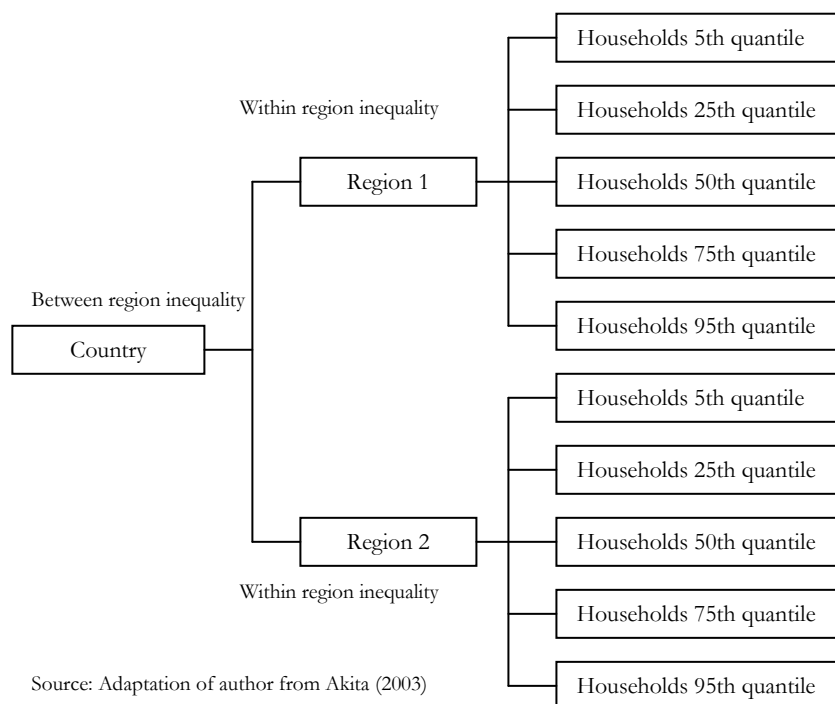
2.4. Regional Inequality: The Measurement is Matter

As pointed out by Ravallion (2003), in analysing of inequality the measurement that we use matter to see pattern of inequality. We borrow this argument to say data that we use to compare is important to see the problem. Prior

⁵ See, for example, Son and Kakwani (2004) and Ravallion (2005)

to this paper, there are several ways to measure regional inequality in Indonesia. Some study use Gross Regional Domestic Product (GRDP) of every district and then compare them based on provincial level. In other study this comparison is added by comparison among bigger region such as big five islands, java-outer java and western Indonesia-eastern Indonesia. However this kind of studies does not consider if among income of people in the district itself is distributed unequally. This also supports from some study that pattern of regional inequality in Indonesia mostly come from within inequality rather than between inequalities⁶. In other words, inequality among people in a region that gives more contribution to overall inequality in Indonesia. Consequently, we should examine regional inequality based on level of welfare of individual in each region and consider the variation at difference point of the income distribution.

Figure 1 Level Analysis of Quantile Regression in Regional Inequality



Similar approach can be used in analyzing determinants of individual inequality in each region. Most previous studies examine the determinants in average level, thus, they cannot capture the points of income which are most affected. However, each determinant has possibility to influence every level of welfare of an individual in a region with different intensity. This is important because this knowledge will affect policy implications that should be implemented. It may be said that if a particular level of education contributes less to

⁶ See, for example, Akita and Alisyahbana (2003) and Resosudarmo and Vidyattama (2006).

a region, then lack of that level of education in that region should be addressed instead of using similar policy in all regions.

Quantile regression can deal with the two problems above. We use this method and employ log of household per capita expenditure (*lhpcce*) to measure regional inequality in Indonesia. We can say comparison of household's expenditure across region as between region inequality while comparison of household's expenditure in a region is within region inequality. To compare with the graph built by Akita (2003), we describe what we will analyze in Figure 1. This method also can capture whether different conditional regression influence income in different point of distribution as we define as regional inequality in this paper.

Chapter 3: Data and Variables

Data that we used in this research are from Indonesian National Socio-Economic Household Survey (SUSENAS) for the year 1996 and 2006. In the rest of this research they will be called as SUSENAS 1996 and SUSENAS 2006 respectively. SUSENAS 1996 was conducted in January 1996 while SUSENAS 2006 it was in Juni-Juli 2006. The collecting time was different because fiscal year in Indonesia has changed from April-March to January-December. However it was never done in fasting month of Muslim in which Indonesia's people have different pattern in consumption.

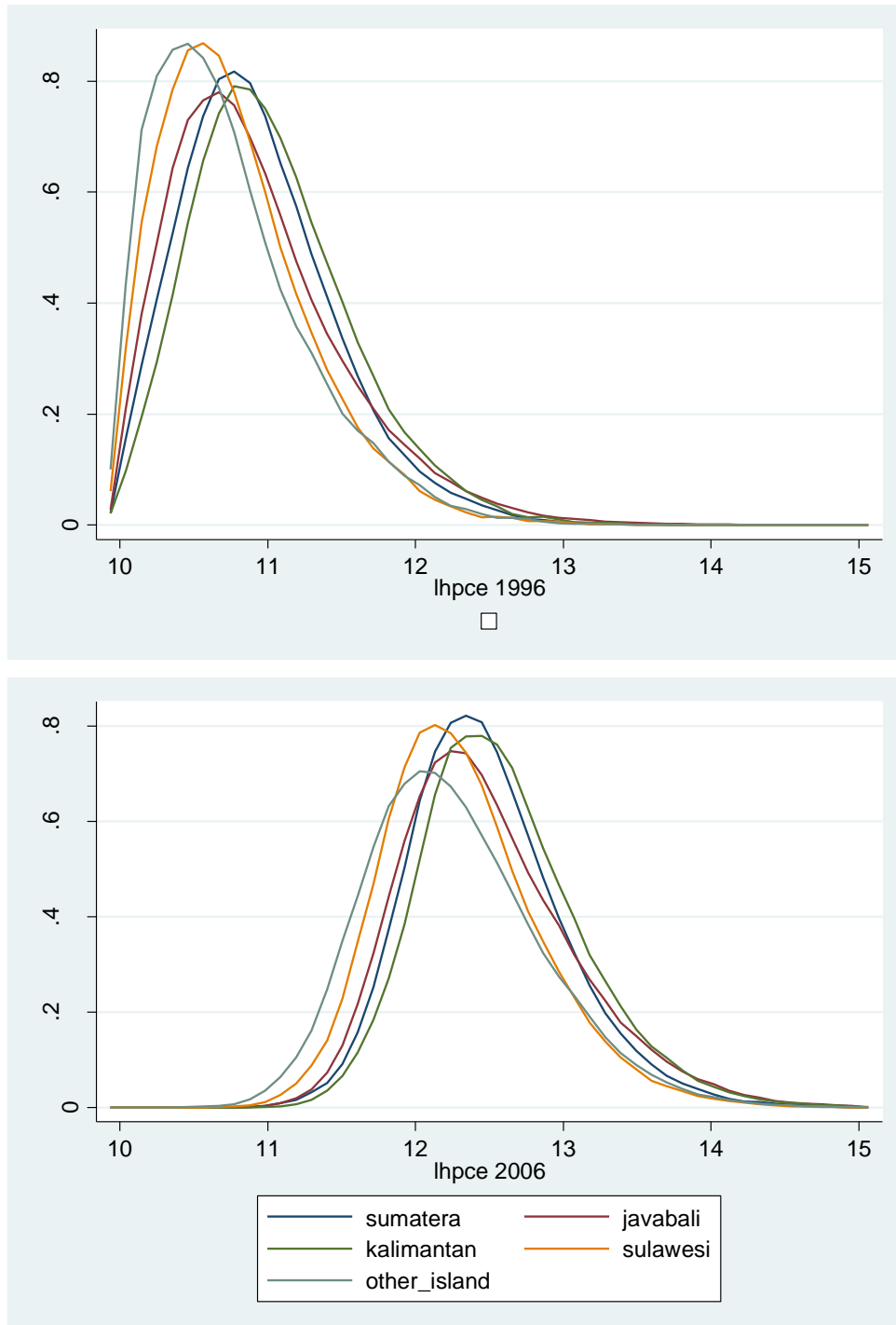
Indonesian Central Bureau of Statistics (BPS) as the organizer of this survey chooses sample in a three-stage stratified sample method. There are two types of questionnaires that are used every year, core and module. Core consists of a set general question that is asked every year and module consists of a specific question according to the topic that is collected every three years. Data for this research come from core questionnaire which is in SUSENAS 1996 there were 206.848 households in this type while in SUSENAS 2006 they were 278.352 households. Numbers of sample in core module were planned so it can capture variation in district level.

We find two level of information, household and individual, in each survey. For individual it is including general characteristics such as age, sex and relationship to household headed to more specific such as education, health and employment. In household level we can find information about expenditure, source of main income and utilization of public facility such as public health service and health card.

Log of Household per capita expenditure per month (*lhpc*) is used as independent variable. Expenditure is used as proxy of income since there is many possibilities problems of using income directly such as under-reported of real income and volatilities its amount (Deaton 1997 & Nguyen 2007). The first dependent variables is a group of household demographic characteristics including number of household member (*hbsize*), the age of household head and age squared divided by 100 (*age*, *asq*) and the gender of household headed (*gend*=1 for female). We expect positive signs for *hbsize* and *age* due to additional members and experience should lead to a higher income. Variable *asq* will have negative signs since children are an extra 'burden' for households while *asq* show decreasing marginal productivity in line with times. (Deaton, 1997 and Sigit, 1985). For female variable based on study by Akita et al (1999) had no significant effect in Indonesia, but we keep this variable as a control.

Education (*educ*) defined as additional year education. We use the higher education of spouse in the household if they have the two. This follows argument from Joliffe (2000) saying member who has the highest level on education will give more contribution to the households. Obviously we expect higher the education will give higher return to welfare of the household. Positive sign is expected from this variable since an additional year of education lead to a higher possibility to get higher welfare.

Figure 2 Kernel Densities of *lhpcce*, 1996 and 2006



Source: Author calculation

The third dependent variable is dummy variable for sector in which household head is working. SUSENAS collects this based on Standard Classification of Sector which consist of nine main sectors: agriculture (*agri*), mining (*mining*), processing industry (*processing*), electricity gas and water (*EGW*), construction (*construction*), trade (*trade*), transport and communication (*TransCom*), finance (*finance*), services (*services*) and other unidentified sectors (*others*) as the

base for this variables. We also control rural-urban dummy ($urban = 1$ for urban) and generally we expect households in urban area have higher inequality than their counterpart in rural area.

In table 3.1 and 3.2 we present the summary statistic of the variables from each year. In both years, $hhsiz_e$ and age show pattern that they increase from 5th quantile to 75th quantile but then decrease in 95th quantile in all regions while in the same time *female* headed household and education have consistently increasing proportion in higher quantile in all regions. Among the job sectors, agriculture is the region with most proportion in all quantile but with decreasing percentage even though in Sumatera and Javabali it is already exceeded by trade and services especially in the highest quantile. Descriptive statistics also confirm agriculture is the only sector that decreases in higher quantile which suits with our hypothesis. However from dynamic pattern from 1996 to 2006 show the share of agriculture only decrease in western part of Indonesia (sumatera and javabali) while the share increases in eastern part of Indonesia though it always increases across quantiles. For sectors out of agriculture there is no interesting pattern except for trade and services explained above.

We plot $lhpce$ from each year in figure 2. Since the range of the $lhpce$ data is very long, to provide clearer picture in this figure we only present $lhpce$ above 8 and below 15. The figure show that in 1996 there were two groups in which Sulawesi and other islands had lower mean compared to the rest. In 2006, difference among regions became less even though we still can identify Sulawesi and other islands were behind.

Table 3.1 Summary Statistic of Variables in 1996

Susenas 1996	Sumatera					Javabali					Kalimantan					Sulawesi					other_island				
VARIABLES	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5
<i>lhpcce</i>	10.140	10.520	10.790	11.100	11.710	10.150	10.510	10.790	11.100	11.800	10.160	10.520	10.790	11.110	11.730	10.120	10.510	10.780	11.100	11.690	10.030	10.510	10.780	11.100	11.710
Hhsize	5.727	5.131	4.656	4.180	3.556	4.840	4.260	4.002	3.801	3.556	5.682	5.018	4.512	4.048	3.436	5.472	4.705	4.285	3.984	3.451	5.514	4.712	4.270	3.954	3.349
Age	43.050	43.590	44.400	44.930	43.400	46.450	46.660	46.790	46.310	44.190	42.380	42.770	42.690	42.910	40.790	43.560	44.320	45.100	44.880	43.170	42.720	43.040	43.110	42.460	40.690
Agsq	19.940	20.650	21.590	22.250	21.000	23.450	23.740	23.930	23.480	21.570	19.390	19.870	19.910	20.220	18.310	20.650	21.530	22.310	22.130	20.600	19.830	20.320	20.490	19.960	18.350
Female	0.098	0.104	0.126	0.135	0.163	0.113	0.121	0.131	0.149	0.164	0.082	0.093	0.096	0.104	0.110	0.106	0.122	0.139	0.162	0.180	0.093	0.103	0.106	0.114	0.137
Educ	5.179	5.721	6.32	7.25	9.237	3.756	4.416	5.14	6.326	9.164	4.399	4.855	5.456	6.204	8.648	4.473	5.195	5.922	7.114	9.804	4.138	5.037	5.792	7.1	9.709
Agri	0.733	0.630	0.506	0.370	0.180	0.596	0.496	0.391	0.269	0.098	0.730	0.684	0.593	0.451	0.216	0.718	0.593	0.482	0.333	0.156	0.807	0.692	0.585	0.418	0.191
Mining	0.009	0.013	0.015	0.016	0.034	0.012	0.010	0.009	0.008	0.008	0.021	0.022	0.017	0.026	0.040	0.007	0.010	0.007	0.010	0.021	0.011	0.008	0.010	0.007	0.022
Processing	0.028	0.037	0.042	0.049	0.054	0.059	0.077	0.088	0.105	0.114	0.046	0.044	0.058	0.071	0.085	0.035	0.038	0.047	0.043	0.036	0.019	0.034	0.032	0.028	0.022
EGW	0.001	0.002	0.004	0.006	0.011	0.001	0.003	0.004	0.005	0.010	0.001	0.001	0.002	0.003	0.008	0.002	0.004	0.003	0.004	0.007	0.000	0.001	0.003	0.008	0.006
Construction	0.028	0.037	0.047	0.049	0.041	0.064	0.067	0.074	0.063	0.051	0.040	0.041	0.053	0.052	0.052	0.027	0.031	0.032	0.043	0.033	0.020	0.033	0.033	0.040	0.043
Trade	0.061	0.083	0.113	0.148	0.182	0.078	0.109	0.141	0.171	0.208	0.042	0.053	0.077	0.110	0.156	0.051	0.083	0.114	0.138	0.151	0.025	0.050	0.066	0.100	0.143
TransCom	0.024	0.041	0.055	0.060	0.058	0.040	0.056	0.063	0.070	0.063	0.019	0.026	0.036	0.051	0.059	0.027	0.036	0.043	0.056	0.046	0.013	0.021	0.027	0.037	0.049
Finance	0.000	0.001	0.002	0.004	0.011	0.001	0.002	0.004	0.007	0.024	0.000	0.001	0.002	0.003	0.011	0.000	0.001	0.002	0.005	0.013	0.000	0.001	0.001	0.004	0.014
Services	0.055	0.082	0.119	0.177	0.266	0.065	0.089	0.121	0.176	0.243	0.042	0.070	0.101	0.149	0.276	0.056	0.099	0.151	0.223	0.340	0.049	0.094	0.168	0.261	0.384
Others	0.005	0.005	0.004	0.003	0.005	0.004	0.003	0.002	0.002	0.004	0.002	0.001	0.001	0.001	0.004	0.002	0.002	0.002	0.001	0.002	0.001	0.003	0.002	0.004	0.009
Urban	0.097	0.169	0.260	0.390	0.608	0.136	0.209	0.305	0.442	0.729	0.049	0.071	0.135	0.255	0.512	0.072	0.144	0.235	0.383	0.610	0.062	0.121	0.182	0.341	0.610

Table 3.2 Summary Statistic of Variables in 2006

Susenas 2006	Sumatera					Javabali					Kalimantan					Sulawesi					other_island				
VARIABLES	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5
<i>lhpcce</i>	11.760	12.130	12.390	12.700	13.280	11.750	12.120	12.390	12.700	13.360	11.780	12.130	12.400	12.700	13.320	11.720	12.120	12.390	12.700	13.270	11.660	12.120	12.390	12.700	13.270
hhsz	5.277	4.608	4.138	3.768	3.312	4.446	3.907	3.623	3.494	3.232	5.236	4.478	4.090	3.689	3.228	5.063	4.265	3.805	3.573	3.127	5.147	4.294	3.958	3.679	3.228
age	44.340	44.650	45.280	45.720	45.370	48.390	47.850	47.720	47.390	45.930	44.170	43.710	43.720	43.420	42.670	43.900	45.010	46.030	46.290	45.620	43.830	43.900	43.800	43.570	42.270
agsq	21.150	21.610	22.340	22.860	22.600	25.240	24.770	24.740	24.380	23.140	20.870	20.660	20.780	20.600	19.900	20.980	22.170	23.270	23.450	22.770	20.810	21.110	21.170	20.940	19.630
female	0.095	0.107	0.125	0.142	0.156	0.115	0.121	0.139	0.150	0.172	0.096	0.089	0.092	0.106	0.112	0.103	0.121	0.136	0.151	0.186	0.100	0.118	0.119	0.139	0.144
Educ	6.117	6.657	7.133	7.86	9.569	4.9	5.637	6.421	7.59	10.32	5.46	6.075	6.65	7.609	9.527	5.649	6.308	7.068	8.229	10.37	5.16	5.904	6.738	7.847	9.999
Agri	0.730	0.650	0.553	0.421	0.242	0.521	0.418	0.309	0.197	0.066	0.723	0.666	0.557	0.426	0.240	0.694	0.592	0.479	0.362	0.204	0.784	0.673	0.579	0.439	0.254
mining	0.008	0.011	0.018	0.030	0.039	0.010	0.009	0.008	0.004	0.005	0.019	0.026	0.037	0.042	0.059	0.009	0.007	0.005	0.008	0.016	0.007	0.011	0.012	0.014	0.031
Processing	0.027	0.036	0.039	0.043	0.048	0.076	0.091	0.106	0.118	0.118	0.035	0.036	0.041	0.047	0.069	0.034	0.047	0.044	0.044	0.045	0.035	0.042	0.043	0.048	0.028
EGW	0.001	0.001	0.002	0.003	0.006	0.002	0.002	0.004	0.004	0.007	0.003	0.001	0.003	0.005	0.009	0.001	0.001	0.003	0.003	0.007	0.001	0.001	0.001	0.002	0.007
construction	0.039	0.044	0.045	0.046	0.041	0.074	0.082	0.076	0.063	0.038	0.043	0.045	0.050	0.055	0.045	0.037	0.043	0.051	0.041	0.033	0.025	0.035	0.040	0.034	0.041
Trade	0.048	0.073	0.101	0.149	0.197	0.090	0.130	0.167	0.203	0.240	0.043	0.065	0.099	0.139	0.177	0.045	0.073	0.102	0.136	0.163	0.023	0.044	0.063	0.108	0.150
TransCom	0.043	0.052	0.064	0.065	0.058	0.051	0.065	0.074	0.074	0.066	0.032	0.040	0.057	0.067	0.059	0.048	0.062	0.072	0.067	0.059	0.028	0.042	0.060	0.073	0.080
Finance	0.000	0.000	0.001	0.003	0.009	0.001	0.002	0.003	0.008	0.021	0.000	0.001	0.001	0.001	0.008	0.000	0.001	0.004	0.006	0.011	0.001	0.002	0.003	0.004	0.009
services	0.035	0.051	0.075	0.120	0.208	0.050	0.073	0.105	0.161	0.219	0.033	0.048	0.073	0.132	0.226	0.038	0.062	0.103	0.173	0.279	0.030	0.068	0.111	0.169	0.274
other	0.069	0.079	0.097	0.117	0.149	0.118	0.117	0.134	0.154	0.204	0.067	0.069	0.079	0.083	0.105	0.090	0.107	0.132	0.153	0.179	0.064	0.080	0.085	0.105	0.121
urban	0.860	0.805	0.736	0.639	0.441	0.783	0.663	0.533	0.373	0.160	0.883	0.851	0.773	0.651	0.426	0.914	0.848	0.749	0.631	0.439	0.931	0.853	0.761	0.635	0.421

Chapter 4: Empirical Results

4.1. Inequality of Households Income across Regions in 1996 and 2006

Many things have happened in Indonesia during the two periods that are used in this paper, such as the financial crisis, the fiscal decentralization and the increasing of oil price. We will discuss them in this section and present the impacts of each of them to household income in the different socio characteristics across regions in Indonesia. However, it is not the intention of this paper to examine these impacts particularly. We only argue that these things could reshape the pattern of regional inequality across households in Indonesia between 1996 and 2006.

4.1.1. Financial Crisis

Indonesia had a convincing economic performance before the financial crisis hit it in the middle of 1997. For example, in the last fifteen years before the crises, Indonesia enjoyed more than 7 percent growth of gross domestic product (GDP) annually. The dependency on oil export was also decreasing while the export from the manufacture sector became more important and got the higher share on GDP⁷. Hill (2000) concludes this performance has translated to create jobs and reduced poverty. In general, the picture of socio demographic of Indonesian's people has changed which indicated by the increasing role of manufactured and service sectors relative to agriculture and the rising of urbanization rate from 25 percent in 1980 to 36 percent in 1996.

By the time Indonesia was attacked by crises, the impact on economy was massive. In the first year, growth decreased until minus 13.7 percent and after that it was only less than 5 percent annually. In the same time the economy also suffered from the inflation bubble as the exchange rate depreciated fast and several other factors that roughly will be explained later in this sub section. However, we will also know those impacts were not similar across sectors. This is supported by the studies of the policy responses that also showed different results across region. From these reasons, we argue that the impact of crises would be translated differently on household characteristics across regions in Indonesia.

One of the impacts of the crises can be seen in the increasing of inflation level. This influences the purchasing power especially for people in lower and around poverty level. There has been a debate on how much exactly the impact of crises on poverty was. For example, regular survey of BPS on inflation reported that the inflation had increased the number of poor people about 25

⁷ See, for instance, Athukorala (2006).

percent and the people in urban area were more suffered from their counterpart in the rural area. By contrast, the widely IFLS survey said the additional number of the poor people was even higher and they in the urban area were the ones who suffered more of the impact. However, considering different intensity of urban and rural area across regions in Indonesia, it is likely that the impact was not the all the same across regions. Frankenberg et al (1999) confirm it by showing from their study that western Nusa Tenggara⁸ and southern Kalimantan were among regions which are most suffered while Java and northern Sumatera are less affected, and southern Sumatera are unaffected. The quite similar results come from Sumarto et al (1999). They categorize the level of effect based on the intensity of effect and pre crises condition on four types: hard hit with good condition (West Java), hard hit with poor condition (Nusa Tenggara and East Kalimantan), not hard hit with good condition (Central Sulawesi and Bali) and not hard hit with poor pre condition (Maluku and Jambi⁹). Evidence also comes from Ravallion and Lokhsin (2007) who find poverty in about 262 districts doubled in 2002. Another conclusion from their study is that poorer regions were less affected by the crises. All explanations above support our arguments that financial crisis that affected households was channelled by the increasing of poor people with the evidences of different intensities across regions.

Crises also affected job sectors. Generally, crises decreased the average of the working hours because many companies were bankrupt or cut their productions. However, the effect was positive for companies with export orientation because they enjoyed higher exchange rates. Agriculture was also less affected; even it and other informal sector¹⁰ could absorb labour from the other sectors. Electricity, gas, water and construction were the sectors that were most affected by the crises. Each has decreased 36.6 percent and 15.8 percent respectively in share of employment (Sumarto et al 1999; Hugo 2000). In region variations, Frankenberg et al (1999) find people in Sumatera and Kalimantan were more likely to lose their jobs than people in Java and Nusa Tenggara. They also get evidence that woman were more likely to lose their jobs than man.

In responding to the crises, households smoothed their consumption by reducing consumption on non food items that unfortunately one of which was education. This was indicated by the decreasing of enrolment level around 5 percent during the peak of crises between 1997 and 1998. The level of younger age students (7-12 years old in primary school level) who dropped out the school even grew from 1 percent in 1997 to 3.5 percent in 1998. The poorest households had 10 times probability to stop their children went to schools (Frankenberg et al 1999). In order to deal with this, Indonesia government introduced scholarship in a part of bigger policy responds on crises. A study from Sparrow (2007) shows this program was successful though he underlines

⁸ Maluku and Nusa Tenggara are included to other regions in this paper

⁹ Jambi is a province in Sumatera

¹⁰ Informal sector or unidentified job sectors are categorized as other sectors

there were regional mistargetting in implementing of this program because of incomplete information about the level of poverty in each region. For this reason, we should understand that the successes were only in the regions where the government got proper information about the poverty level. To sum up, the effect of crises on education level most probably would be different across regions in Indonesia.

The studies on regional inequality in the beginning of crises confirmed our arguments as well. Among others, Akita and Alisyahbana (2002), who compare GDP in the district level from 1993 to 1998, find per capita level of Indonesian people fall to the 1995 level, and the regional income inequality in Indonesia went back to 1993-1994 level. They also discover that the biggest contributors within the provinces are Jakarta, West Java and East Java in Java, and Riau in Sumatera

4.1.2. Fiscal Decentralization

Fiscal decentralization was established based on Law No. 22/1999 and Law 25/1999 which then replaced by Law 32/2004 and 33/2004 respectively. The first law is to regulate the right and responsibility of the local government and the second law is to set up the economic and financial aspect of decentralization. Actually, Indonesia has already adopted decentralization in 1970s. But in reality, over thirty years the central government controlled all decision in allocating development and the local government only implemented it. As a result, the regional inequality was very high and many regions were dissatisfied of what the central government has done. To respond to this situation, Indonesia introduced Local Autonomy or in economic context is called as fiscal decentralization. Nevertheless, the policy was more in the political basis, there was no proper preparation such as any complete studies before the regulations passed the parliament. Thus, Indonesia decentralization is called a big bang event in the way it was started. Consequently, in regulation itself there were many interpretation, debate, and conflict of interest among the stakeholders. Changing the two basic regulations from 1999 to 2004 as stated in the beginning was only a nutshell in this debate¹¹.

The main objective of decentralization is to get the governments closer to their societies so they will understand the society needs better. By doing so, the next expectation is they know how to increase welfare of the societies. In the regulations about decentralization, there are also policies to manage the relationship between local government and local parliament. However this blueprint is still far from reality. Hirawan (2007) argues there is no clear fact in supporting that expectation yet. She says, to attain the expectation there are two conditions that have to be fulfilled: sufficient education and local participation, which unfortunately are still hard to get. Local leader and local elite, she continues, are reluctant to share the information and access about local decision making. Consequently, it is difficult for local societies to control and to

¹¹ See, for example, Brodjonegoro (2003).

influence local policies. This answers why there are only a few people who can enjoy the results of development, while the public needs could not be all satisfied.

Decentralization also means the delegation of power from the central government to lower level government. Since 2004, it also has been empowered by direct election in choosing local leader. With check and balance relationship and participative election, there is a precondition to create higher accountability in serving public needs. Nevertheless, the facts do not support this argument. Kuncoro and Handerson (2006) suggest there is a pattern of red type corruption in Indonesia. Local officials are given bribes by firms to issue licence with the expectation that the officers would give a lower cost in providing public goods. They also argue on the limited sources of revenues that lead to insufficient salary for local officers as one factor that supports this modus. They find that in the regions that have been better funded, the red type decline. Accordingly, they proposed to increase education of local officers because this variable can also reduce level of red type corruption. Corruption and other misused of the local budget off course will lead to a lower intention to provide a better public service, not to say that it will reduce the 'real budget' which should be allocated in poverty alleviation and thus decrease opportunity to reduce gap between rich and poor people.

The pattern of fiscal decentralization itself was started by the distribution power in spending budget. There are three schemes: Share of Fund (DBH), General Allocation Fund (DAU), and Special Allocation Fund (DAK). DBH is shared income from tax and natural resource that collected by central government. Because of the nature of its allocation, DBH mechanism triggers inequality in the local government's budgeting. Regions that have abundant natural resources such as East Kalimantan, Papua, Aceh and Riau in Sumatera get the bigger amount compare to other provinces/districts. Papua and Aceh also have privilege to get the special Autonomy Fund (Dana Otonomi Khusus) to respond high dissatisfaction in those regions that had made them asked to disintegrate from Indonesia.

DAU is allocated based on fiscal gap and basic allocation. Basic allocation for a region is the total salary of civil servants in that region. Fiscal gap is the difference between minimum funds that are needed to provide basic public service and fiscal capacity of the regions. Basic needs is calculated from certain categories of the regions such as number of population, wide area, index of construction price, Gross Regional Domestic Product (GRDP) and Human Development Index, while fiscal capacity of regions is measured from local sources fund such as Own Revenue (PAD) and DBH. The last scheme in fiscal decentralization, Special Allocation Funds (DAK), is to finance special activities in regions that suits to national priorities. This fund basically includes in the national ministry budget but it is allocated to the region based on several criteria that fit with the ministry objectives.

The first impact of decentralization obviously is the increase of the local budget. After decentralization, the local budget of most regions increased five times even twenty times compare to before decentralization. This is because the three schemes of fiscal decentralization contribute to average 85% revenue of district and average 70% revenue of province. Nationally amount of DAU

also increased from only 81 trillion rupiahs in 2001 to 200 trillion rupiah in 2006 whilst DAK was only small part of transfer; 1 percent in 2001 and 3% in 2006. Note that the increasing of DAU was not only due to the rising of the national budget over the period, but also the proliferation of both district and provinces number. However, the latter now is one of the decentralization problems in addition to lack of quality of human resource. Most new regions became burden for the central government because they rely on the fund transfer from central government but cannot provide better service compare to before proliferation (Hirawan 2006).

How do these correlate with the household income and its distribution across regions? We argue that if fiscal decentralization did not work because corruption or other misused problems, it will impede improvement of level of inequality and stay in the same level as it is before decentralization. Another possibility is if this problem was not random, *ceteris paribus*, it would lead to a new pattern of regional inequality in Indonesia a part from the success and bad stories from fiscal decentralization. Even though it is no intention of this paper to examine the impact of such things, however, we argue that the shape of regional inequality among region in Indonesia in any case might already change.

Some previous studies also support our arguments. Aziz (2008) says the growth of GDRP in the first six years of decentralization is little and its magnitude is very slow. He argues that improper preparation for decentralization, macro economic problems and conservative government responds are the root problem. For inequality, Resosudarmo and Vidyattama (2006) argue regional inequality was very high in the first two years after decentralization and Swastyardi (2008) finds that the fiscal decentralization tools¹² do not contribute to the improvement of inequality across regions.

4.1.3. Increasing of Oil Price

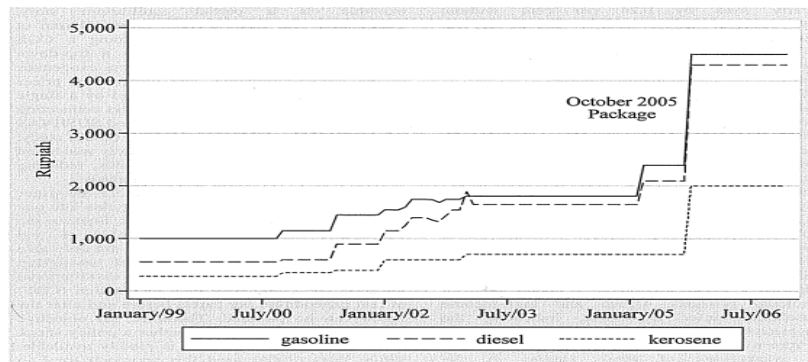
In the last decade except from the crisis, Indonesia households suffered of oil price volatilities. Unfortunately, in many cases the volatilities were the effect of the surging of world oil price. In Figure 3, we present the fluctuation of several kind of fuel from 1999 to 2006 as an illustration. Indonesia previously was an oil exporter but because its oil production had decreased since 2003, Indonesia became a net oil importer. The problem was the policy from previous administration that let the government decides the market price of oil, and covered some part of the oil cost in a form of subsidy.

This affects national budget in two ways simultaneously. In one hand, the decreasing of oil production obviously means the decreasing of the government revenue. In the other hand, the world oil price which keep climbing up increased government spending on subsidy. Ikhsan et al (2005) report the increasing of the oil price in 2005 contributed to the double share of fuel subsidy in government budget or about 4 percent of GDP. Government then responded by increasing the oil market price. The government also argued the

¹² He examines data of DAU between 2001-2006

subsidy was misallocated since most of the consumption was by rich people who have vehicle, car and motorcycle, not the poor people. Another argument was on the disparity of price in Indonesia triggered the neighbour countries to smuggle the oil. Then the government reallocated the budget that supposed to use for subsidy to other spending that may help alleviate poverty.

Figure 3 Price of Gasoline, Diesel, and Kerosene, 1999-2006



Source Yusuf and Resosudarmo (2008)

The main impact of this policy is to poverty. Some studies show different results on the poverty incidence which mainly based on their assumptions about how much the impact on inflation, including which items should be considered in calculation. In this paper, we show two studies that can describe the debate: Firstly is a study by Ikhsan et al (2005) who argue the impact of increasing oil to inflation was less than one percent, 0.9782%, which led to the increasing of poverty rate about only 0.24%. For them, the compensation program or reallocation the subsidy fund to other sectors such as cheap rice and scholarship could tackle the effect to poor people. Though there was a leakage, they assumed around 25 percent; it only contributed to 0.55 percent additional poverty.

The second study is by Sugema et al (2006). They argue that the increasing of oil price added 1.98 percent to poverty level. They said the inflation estimation of what Ikhsan et al (2006) stated only took account natural effect on inflation such as household expenditure and industrial cost and disobeyed wider impact such as increasing oil price also translated to increasing of commodity unfairly. They say traders used the increasing of oil price to enlarge their profit disproportionately with the effect to the raising cost of their product. They also challenged the compensation as ineffective program based on their study.

Actually, there has been a debate of what right policy that should be chosen by the government. For example, Aziz (2006) says the main reason for the increasing of oil by the government was that the subsidy was a big burden for the government. Instead of increasing the market oil price enormously, he suggests the government should cut another big burden in national budget which is a payment of principal and interest of the domestic debt and recap bond that hugely allocated by the government in the scheme of responding the financial crises in 1998. The money that reallocated also should be spent on infrastructure that related to agriculture. He proves that this alternative policy would not affect macroeconomic stability, moreover the impact on poor people and bigger population as a whole is larger. Yusuf and Resosudarmo (2008) support

this view. They simulate the increasing price and find it was enough if the government only increased the vehicle's fuel price. They argue that what government have done would increase inequality, particularly among urban people.

Another problem is the government policy in reallocation the fund from subsidy. To deal with the short term impact, the government introduced unconditional direct transfer to poor people. Every poor household that already surveyed was given Rp 100,000 rupiah each month and paid in three months at once. In October 2005, there were 15.5 million households received this transfer which cost the total of the government budget of 4.6 trillion rupiah. However, since this program was prepared improperly, there were mistargetting problems. Hastuti et al (2006) find that not all the receivers were poor people, on the contrary there were many poor people who did not get the transfer. Meanwhile, Yusuf and Resosudarmo (2008) says giving the transfer homogeneously while the impact were heterogeneous, would over compensate in one area and under compensate in the other area. However, they say the impact would be larger in urban area than in rural area. They also recommend non cash compensation such as educational and health subsidies were ineffective to diminish the short impact of increasing oil price.

Finally we will conclude how the increasing of oil price would probably changed inequality of household income across regions in Indonesia between 1996 and 2006. First, we should consider the highest increasing was in 2005 and policy respond, unconditional transfer, was in October 2005 or less than year before Susenas Survey in 2006. The second, out of the different views about the impact to poverty level, there is an agreement that the increasing of oil price increased the number of poor people. Therefore, the effect of the increasing of oil price to the result of this paper depends on how fast households across regions adapt. However, some studies that were already presented show the impact was different but the policy respond was uniform. We argue this will lead to a new equilibrium in inequality. Since this increasing of oil price mainly affect poor people in urban area, the impact across region in Indonesia will depend on the spread of urban area in all regions.

4.2. Population Structure and Regional Inequality in Indonesia

In this section we describe the picture of inequality among regions in Indonesia to give ideas before we see the regression results. First we present the share of population across regions in Table 4.1.

Table 4.1 Share of Area and Population across Regions

Regions	Area (%)	Population (%)								
		1930	1961	1971	1980	1985	1990	1995	2000	2005
1. Java	6.9	68.7	65	63.8	61.9	60.9	60	58.9	59.1	58.8
2. Sumatera	24.7	13.5	16.2	17.5	19	19.9	20.3	21	20.7	21
3. Kalimantan	28.1	3.6	4.2	4.4	4.5	4.7	5.1	5.5	5.5	5.5
4. Sulawesi	9.9	6.9	7.3	7.1	7.1	7	7	7.3	7.3	7.2
5. Other Island	30.4	7.3	7.3	7.2	7.5	7.5	7.6	7.3	7.4	7.5
Total	100	100	100	100	100	100	100	100	100	100

Source: Lembaga Demografi FEUI

From the table above we can see that in Java there are more than fifty percent of Indonesian people though it only consist less than 7 percent of all area. This percentage consistently decreased over 70 years but in overall it is still not balanced. Population in Sumatera had increased in the same period and it is already proportional with its area in 2005. Kalimantan had a fewer growth on population but it is still far from its area. Sulawesi and Other Islands did not much increase over the period and stay in 7.2 percents and 7.5 percents respectively although the two islands already capture more than forty percents of Indonesia area. In the region analysis, the western part of Indonesia (Sumatera and Java-Bali) commonly has better wealth compare to the eastern part.

Next, we see Table 4.2 which confirms inequality of GRDP among regions in Indonesia. Java constantly gets sixty percent share of all GRDP. Though in overall GRDP of Indonesia increased over the period but the share remains the same. This share actually in line with the percentage of population but Kalimantan improved and in the end period it has higher percentage than its population while Sulawesi and other islands get lower GRDP than their share in population. Share of GRDP in Java and Sumatera are similar with the percentage of population in these islands.

Table 4.2 GRDP in year 2000 constant price, 2001-2006 (million rupiahs)

Islands	2001	%	2002	%	2003	%	2004	%	2005	%	2006	%
Sumatera	313.4	22	331.3	23	346.3	23	356.9	22	369.6	22	389.3	22
Java Bali	850.7	60	885.8	60	929.7	60	977.5	61	1,033.7	61	1,093.2	61
Kalimantan	135.4	10	139.1	9	142.8	9	148.8	9	154.7	9	160.5	9
Sulawesi	60.0	4	62.7	4	66.0	4	69.7	4	74.1	4	79.2	4
Other Island	50.1	4	52.3	4	53.7	3	50.9	3	58.0	3	55.5	3
Total	1,409.7	100	1,471.2	100	1,538.5	100	1,603.9	100	1,690.1	100	1,777.7	100

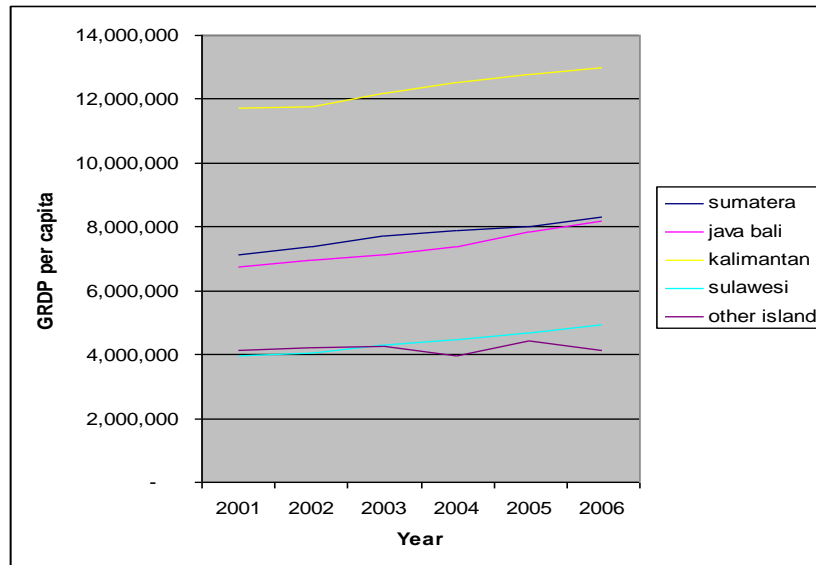
Source: BPS

To explain the relationship between this dispersion of population and level of GRDP, Nazara (2010) provides two arguments. First, to fulfil the needs of many people who lived in Western Indonesia especially in Java, the Central Government in the past allocated the biggest share of the national budget in this region. Then the high growth resulted from this investment has attracted people to migrate to Java. Finally, this became a recycle process that led to the higher inequality. The second argument is that the return of investment in the islands outside Java actually is spent to buy products from Java. To support this argument, he cites the study of Hewings and Hulu (1993) who found an economic shock outside Java have increased the output in Java. This is the case since Java provides input that is used in the outside Java's productions, and then buys the product from those productions.

This, he continues, makes regional inequality in Indonesia a structural problem. As explained above, unequal dispersion of population lead to disparity in government budgeting. In the other side, infrastructure investment is always in consideration to support economic activities. As a result, the input and output of the economy always follow economic activities and population. In the long run, this pattern sustains inequality across regions. Unfortunately many regions-provinces or district-that get high budget since they have abun-

dant resources do not spend their money to create economic activities in their regions. Many of them just save their money in the bank or use the money to buy goods and services from other regions.

Figure 4 GRDP per capita in year 2000 constant, 2001-2006



Source: author calculation from BPS data

The distribution of this GRDP among people in each region is also different as we can see from the GRDP per capita in Figure 4. This illustrates the picture of income and its distribution across regions. Kalimantan has the highest GRDP per capita and increase over the period. This is very high mainly due to oil endowment in this region, especially in eastern part. This might be translated to within inequality in this region. Level in Java Bali and Sumatera are similar and a bit closer in the end period. Sulawesi has consistent increasing GRDP while Other Islands has a fluctuated GRDP, though the end of period it seems to back to the beginning level. It would be interesting how these fluctuations are distributed among household across regions.

Table 4.3 Theill Index across Regions, 2001-2006

Theill Index	Sumatera	Java-Bali	Kalimantan	Sulawesi	Other Islands
2001 Within region	0.21739	0.27705	0.09829	0.09828	0.82027
Between region	0.16156	0.01344	0.14302	0.01193	0.33230
Total	0.37895	0.29049	0.24131	0.11020	1.15257
2002 Within region	0.12076	0.25275	0.10350	0.11839	0.86728
Between region	0.10648	0.01180	0.16883	0.01414	0.32147
Total	0.22724	0.26455	0.27233	0.13253	1.18875
2003 Within region	0.10978	0.24667	0.09871	0.12106	0.77840
Between region	0.10066	0.01191	0.15699	0.01548	0.28066
Total	0.21044	0.25858	0.25570	0.13654	1.05906
2004 Within region	0.13855	0.25275	0.10739	0.15699	0.64860
Between region	0.08659	0.01323	0.14730	0.02277	0.18284
Total	0.22514	0.26598	0.25469	0.17977	0.83144
2005 Within region	0.10677	0.25247	0.11955	0.15561	0.90460
Between region	0.08856	0.01159	0.15339	0.02362	0.22688
Total	0.19534	0.26406	0.27294	0.17923	1.13147
2006 Within region	0.07621	0.25707	0.14049	0.41718	0.69269
Between region	0.09038	0.01253	0.14838	0.09150	0.13132
Total	0.16659	0.26960	0.28887	0.50868	0.82401

Source: Swastyardi (2007)

To show the pattern of the regional inequality between 1996 and 2006, we present study from Swastyardi (2008) in Table 4.3. He uses GRDP in the dis-

trict level and examines with theill index. His main finding is overall inequality in Sumatera, Java-Bali and other islands decrease while Kalimantan and Sulawesi increased. However, the level of inequality in Other Island is not stable over the period, while in Java-Bali the magnitude is small, and in Sumatera there is a quite good improvement. The increasing of inequality in Kalimantan and especially in Sulawesi is very high in the same period. Generally, he concludes nationally inequality in Indonesia decreases a bit over the period.

Table 4.4 Human Development Index in each region, 1999-2006

Provinces	1996		1999		2002		2004		2005		2006	
	HDI	Rank	HDI	Rank	HDI	Rank	HDI	Rank	HDI	Rank	HDI	Rank
Sumatera												
NAD	69.4	9	65.3	12	66.0	15	68.7	18	69.05	18	69.41	18
North Sumatera	70.5	7	66.6	8	68.8	7	71.4	7	72.03	8	72.46	8
West Sumatera	69.2	11	65.8	9	67.5	8	70.5	9	71.19	9	71.65	9
Riau	70.6	6	67.3	4	69.1	5	72.2	5	73.63	3	73.81	3
Jambi	69.3	10	65.4	11	67.1	10	70.1	10	70.95	11	71.29	10
South Sumatera	68.0	15	63.9	16	66.0	16	69.6	13	70.23	13	71.09	13
Bengkulu	68.4	12	64.8	13	66.2	14	69.9	11	71.09	10	71.28	11
Lampung	67.6	16	63.0	18	65.8	18	68.4	19	68.85	19	69.38	19
Babel	-	-	-	-	65.4	20	69.6	12	70.68	12	71.18	12
Kepri	-	-	-	-	-	-	70.8	8	72.23	7	72.79	7
Java Bali												
DKI Jakarta	76.1	1	72.5	1	75.6	1	75.8	1	76.07	1	76.33	1
West Java	68.2	14	64.6	15	65.8	17	69.1	14	69.93	14	70.32	14
Central Java	67.0	17	64.6	14	66.3	13	68.9	17	69.78	16	70.25	15
Yogyakarta	71.8	2	68.7	2	70.8	3	72.9	3	73.50	4	73.70	4
East Java	65.5	22	61.8	22	64.1	25	66.8	23	68.42	22	69.18	20
Banten	-	-	-	-	66.6	11	67.9	20	68.80	20	69.11	21
Bali	70.1	8	65.7	10	67.5	9	69.1	15	69.78	15	70.07	16
Kalimantan												
West Kalimantan	63.6	23	60.6	23	62.9	27	65.4	27	66.20	28	67.08	28
Central Kalimantan	71.3	5	66.7	7	69.1	6	71.7	6	73.22	5	73.40	5
South Kalimantan	66.3	19	62.2	21	64.3	23	66.7	24	67.44	26	67.75	26
East Kalimantan	71.4	4	67.8	3	70.0	4	72.2	4	72.94	6	73.26	6
Sulawesi												
North Sulawesi	71.8	3	67.1	6	71.3	2	73.4	2	74.21	2	74.37	2
Central Sulawesi	66.4	8	62.8	20	64.4	22	67.3	22	68.47	21	68.85	22
South Sulawesi	66.0	21	63.6	17	65.3	21	67.8	21	68.06	23	68.81	23
Southeast Sulawesi	66.2	20	62.9	19	64.1	26	66.7	25	67.52	24	67.80	25
Gorontalo	-	-	-	-	64.1	24	65.4	28	67.46	25	68.01	24
West Sulawesi	-	-	-	-	-	-	64.4	29	65.72	29	67.06	29
Other Regions												
NTB	56.7	26	54.2	26	57.8	30	60.6	33	62.42	32	63.04	32
NTT	60.9	24	60.4	24	60.3	28	62.7	31	63.59	31	64.83	31
Maluku	68.2	13	67.2	5	66.5	12	69.0	16	69.24	17	69.69	17
North Maluku	-	-	-	-	65.8	19	66.4	26	66.95	27	67.51	27
West Irian	-	-	-	-	-	-	63.7	30	64.83	30	66.08	30
Papua	60.2	25	58.8	25	60.1	29	60.9	32	62.08	33	62.75	33
Indonesia (BPS)	67.7		64.3		65.8		68.7		69.57		70.10	

Source: BPS

Finally, to see the pattern in household level we show human development index of provinces to give indication about standard living of households in each region in Table 4.4. All provinces has higher HDI index from the beginning of study in 1996 to the end in 2006. The provinces in other islands and Sulawesi, except for North Sulawesi, have lower index than Indonesia's average rate. In Kalimantan, we can see inequality in term of HDI in this region. Central Kalimantan and East Kalimantan is among provinces that have the highest HDI while in west Kalimantan and south Kalimantan the index are in low level. In Sumatera, the rank of provinces is almost similar between 1996 and 2006 and the level in the same period is also short. In Java-Bali the gap is higher, especially in Jakarta compare to the rest, though the rank is almost the same between 1996 and 2006.

4.3 Regional Inequality in Different Level of Income

Previous studies on inequality in Indonesia rely on the mean data. However, from our explanation in earlier sections, the determinants effect of inequality would be not the same in different level of income. For example, in the peak of financial crises, the female are more severe to lose jobs in the agricultural sector with a low paid (lower quantile of income). The impact of the increasing of oil price is also higher in lower quantile which increased poverty level. But those in higher quantile should pay extra expenditure to buy oil to their vehicle. In decentralization, we see the higher budget in local government is higher for elite and other people in the higher quantile. We expect all socio demographic characteristics and several things that may drive change of income structure in Indonesia differently. Consequently, regional inequality would be more appropriate if we control the pattern in the different level of income.

Examining this, we use quantile regression. In this method we analyze *lnpce* based on its distribution in several groups called quantile in each region. Then, in every quantile we examine the influence of socio demographic characteristic on the distribution. By doing so, we can address second objective and third objectives of these paper while for the first objectives we will employ this method in two concerned periods.

4.3.1 The Method: Quantile Regression

In this section we will discuss briefly about procedure and properties of quantile regression. This method firstly introduced by Koenker and Bassett (1978) and has been widely developed to many aspects in econometrics such as the multivariate quantile regression (Chaudury 1996; Chakraborty 2001), the two stage quantile regression (Kim and Muller 2001) and the panel data (Koenker 2003; Geraci and Bottai 2003). In analyzing inequality among others this method has been used by Nguyen et al (2007) and Qu and Zhao (2008) in Vietnam and China's case respectively. This paper widely refers to their papers.

Main advantage of this method is to fix with the skewed nature of distribution income as we described for Indonesian's cases in previous section. In the standard regression, we only analyze that in which we cannot capture variation behavior of inequality across different level of income. Quantile regression

also allows us to have different marginal effect for each quantile. As a result we can plot return of the covariate in dependent variable at different point of distribution.

Consider, in any given function $F(y)$ we define θ th quantile, for $0 < \theta < 1$, as $Q(\theta) = \inf \{y: F(y) \geq \theta\}$, and of course we should hold $P(Y \leq y)$ ¹³. Shortly this definition tells us the members of θ th quantile are all observations between θ and $(1-\theta)$. To get a clear understanding, suppose that we have a model from ordinary least square in form $y_i = \beta X_i + u_i$ where y_i is a dependent variable for $i=1, \dots, n$, x_i is explanatory variables and β is its coefficient and u_i is the error term. Value of coefficient β will be found by minimizing values of the sum of squares residuals. In quantile regression we minimize the absolute sum of the errors. Coefficient of any θ th for every value of i where is determined by minimizing following equation:

$$\min_{\beta} \sum_{i \in \{i: y_i \geq x_i \beta\}} \theta |y_i - x_i \beta| + \sum_{i \in \{i: y_i < x_i \beta\}} (1 - \theta) |y_i - x_i \beta| \quad (1)$$

or it is generally only written as:

$$\sum_{i=1}^k \rho_{\theta} |y_i - x_i \beta| \quad (2)$$

Where $\rho_{\theta}(\epsilon)$ is the check function would be equal to $\theta\epsilon$ if $\epsilon \geq 0$ or equal to $(\theta-1)\epsilon$ if $\epsilon < 0$. This problem will be solved by using linier programming method (Dickey 2007).

Interpretation of coefficient $\beta_k(\theta)$ in quantile regression is quite similar with OLS that marginal change in the dependent variable due to marginal change in the k th variable conditional on being on θ th quantile. For example our dependent variable is log of expenditure and the independent variable is level of education. If we find at $\theta = 0.025$, $\beta_k(0.025)$, this value show the marginal return of education in the bottom 2.5 of the expenditure.

4.3.2. Results

In this sub section we present results from the quantile regression. The estimation will be in form of the equation (1) as follow¹⁴:

$$\ln hpc_e_{\theta} = \beta_{\theta}^0 + \beta_{\theta} X + \delta_{\theta}^0 \text{Re } g + \delta_{\theta} X \cdot \text{Re } g + \gamma_{\theta}^0 u + \gamma_{\theta} X \cdot u + \alpha_{\theta}^0 u \cdot \text{Re } g, \quad (1)$$

where $\ln hpc_e$ is log of households per capita expenditure in θ th quantile, β_{θ}^0 is the regression intercepts, $\text{Re } g$ is the regions dummy, u is the urban dummy, X is covariate matrix (all independent variables excluding for the region dummy and the urban dummy, $X \cdot \text{Re } g$ and $X \cdot u$ are matrixes interactions between covariate matrixes and region dummy and urban dummy respectively, $u \cdot \text{Re } g$ is

¹³ This part is derived mainly from Koenker and Bassett (1978), Deaton (2000) and Dickey (2007)

¹⁴ This model follows Nguyen (2007) with adaptation to regional inequality.

the matrixes interaction between the urban dummy and the region dummy, and finally $\beta_\theta, \delta_\theta^0, \delta_\theta, \gamma_\theta^0, \gamma_\theta, \alpha_\theta^0$ are corresponding regression coefficients.

Mean difference

Our first discussion will be started on simple comparison across regions by using restricted version of (1) that only consider the intercept, regional dummies and urban dummies. This step is to show us initial description to what degree the regional gap exists across quantiles. In table 4.5, we present 5 selected quantile in addition to OLS results to show how this method give us more explanation about the gap.

Table 4.5: Estimation of Regional gap at the mean and at various quantile¹⁵

Year	Variables	OLS	Quantile					
			5 th	25 th	50 th	75 th	95 th	
1996	Sumatera	0.216*** (0.00485)	0.205*** (0.00967)	0.251*** (0.00802)	0.230*** (0.00653)	0.208*** (0.00527)	0.227*** (0.0109)	
	Javabali	0.0607*** (0.00449)	-0.0122 (0.00753)	0.0516*** (0.00726)	0.0553*** (0.00625)	0.0688*** (0.00457)	0.158*** (0.0110)	
	Kalimantan	0.309*** (0.00593)	0.347*** (0.0100)	0.339*** (0.00821)	0.314*** (0.0103)	0.288*** (0.00670)	0.288*** (0.0170)	
	Sulawesi	0.0644*** (0.00546)	0.0895*** (0.0130)	0.0882*** (0.00825)	0.0661*** (0.00580)	0.0474*** (0.00659)	0.0716*** (0.0137)	
	Urban	0.567*** (0.00281)	0.427*** (0.00777)	0.478*** (0.00331)	0.535*** (0.00328)	0.627*** (0.00291)	0.799*** (0.00870)	
	Other island (Base)	11.91*** (0.00406)	11.06*** (0.00496)	11.57*** (0.00636)	11.91*** (0.00570)	12.25*** (0.00415)	12.75*** (0.00998)	
	Observations	200,997	200,997	200,997	200,997	200,997	200,997	
	2006	Sumatera	0.139*** -0.00341	0.252*** -0.00475	0.204*** -0.00353	0.150*** -0.004	0.102*** -0.0043	0.0588*** -0.0112
		Javabali	0.0544*** -0.00334	0.169*** -0.00603	0.105*** -0.00474	0.0504*** -0.00362	0.00143 -0.00311	-0.0201** -0.009
		Kalimantan	0.243*** -0.0041	0.338*** -0.00619	0.302*** -0.00435	0.245*** -0.00476	0.199*** -0.00524	0.179*** -0.0129
Sulawesi		-0.00107 -0.00386	0.0983*** -0.00513	0.0533*** -0.00379	0.000314 -0.00566	-0.0440*** -0.0036	-0.0668*** -0.00782	
Urban		0.481*** -0.00211	0.301*** -0.00253	0.384*** -0.00268	0.464*** -0.00223	0.565*** -0.00293	0.703*** -0.00567	
Other Island (Base)		12.19*** -0.0029	11.40*** -0.0042	11.82*** -0.00336	12.15*** -0.00343	12.51*** -0.00302	13.09*** -0.00753	
Observations		277,200	277,200	277,200	277,200	277,200	277,200	

lhpce of other island in rural area is the base variable in this estimation and other coefficients are for each island that represents Indonesia's varieties. These coefficients indicate the difference in log of per capita household expenditure in other islands with other region in θ th quantile. Based on the above table we can see all coefficients are highly significant except for 5th quantile in java bali in 1996 and 75th quantile and 50th quantile in Javabali and

¹⁵ Difference of observations explained in chapter 3 with providing here due to the gap between the samples surveyed and the data provided publicly from BPS. Unfortunately, we can not find distribution of uncollected questioner in each region.

Sulawesi in period 2006 respectively an generally gap is lower in 2006 than of 1996. Interestingly we do not see any patterns if the gaps increase across quantile on the contrary they decrease in Kalimantan both in 1996 and 2006. Decreasing value of inequality is quite consistent with studies of Swastyardy (2007) who found regional inequality in Indonesia slowly declined in period 2001-2006. Increasing of return in higher quantile in also confirm benefit of economic mostly go to richer people. When growth of GDP was still positive in 3-5 percent annually there was no improvement in poverty alleviation

Results of Full Model

We continue our discussion with quantile regression after including all regressors. The results for quantile 5, 25, 50, 75 and 95 for both periods are presented in Table A.1 and A.2. The tables show not all coefficients are significant but each variable at least has one significant coefficient in certain quantile. This illustrates that impact of each variable is not the same in different level of distribution of *lhpce* which means also inequality among households across quantile is also varied. It is also important to say that insignificant coefficient in interaction variable and each region show there is no discrimination of influence of this variable on distribution of *lhpce* with that on base region (in this paper is other islands) while negative sign in this interaction indicates returns for the region is lower than that on the base region.

Now we see general patterns of each category of inequality determinants in each region. First we see the pattern of household characteristics. In 1996, all coefficients of *hbsize* are significant and its value decrease from low quantile until median but it then increases in upper quantile. This variable indicates that low income number of member in a household is a burden but in high income this member may be contribute and as a result increase level of *lhpce*. From regions comparison, all coefficients are significant except for Kalimantan and 95th quantile in Sumatera. We can say *hbsize* has different role on distribution of *lhpce* across regions while insignificant coefficient in Kalimantan may be due to high inequality in this region thus *hbsize* only has small effect there. Similar patterns we find in age and *agsq* but in this variable, each region has at least one significant coefficient. It seems there is a fluctuation of value of coefficient in these variables with a tendency the highest values is in quantile after median. The last variables in this category, female, shows only small coefficient are significant. This is consistent with Akita (1999) who says female head of households has no significant effect in Indonesia.

In 2006, coefficients of household characteristic variables have some different. Coefficient of *hbsize* in 25th quantile now is insignificant and on the contrary age and *agsq* are insignificant. It seems that there were changed of influence of population structure in this quantile. In region comparison, interaction of *hbsize* and Kalimantan are now significant in median and 75th after insignificant in 1996 while other regions coefficient did not much change. Patterns across quantile are different. In this period, coefficient of *hbsize* and consistently increase in higher quantile and the same for *age* and *agsq* which higher/lower in upper quantile. Finally, in this category female headed household has also few significant coefficients. Overall, influence of household characteristics decrease on income as a result it reduces regional inequality and also in different

level of distribution. Except from that, generally different of coefficients are lower in 2006 than in 1996 which show role of household on inequality decrease over the two periods. It is consistent with study of Akita and Alisyahbana (2002) and later Ravallion and Lokhsin (2007) who find crises and other situation that happened in indonesia have changed structure of population including their role to distribution of income.

Furthermore, we will discuss the results for job sectors in which the heads of households were working. In 1996, the highest coefficients are in finance, trade and transportation, and communication. The coefficients in these variables show Kalimantan again has many insignificant coefficient such as all trade interactions, transportation and communication in median and above and finance after median. It indicates this region has similar pattern with other islands. Sulawesi also has similar situation especially in the finance sector after median. Then we find the pattern of coefficient across quantile in these sectors is varied. Trade increases in higher quantile; finance increases in the two first quantile, decreases in median but then increases again after median; transportation decreases until 75th quantile but then increases in the top quantile. Other sectors also show quite similar faces. All coefficients of construction sector in Kalimantan are insignificant and also it is the case for service sector after median. Another interesting fact is that there is a tendency in significant coefficient in top quantile except for javabali and urban area. For example all coefficients of other regions in electricity, construction and finance sectors are insignificant in 95th quantile.

In 2006, there is not much different about different of significance across regions. Kalimantan has many insignificant coefficients which indicate within inequality in this regions is very much the same with that in other islands. In sector comparison, difference of coefficient decrease quite large except for service sectors that is higher compare to 1996. This illustrate role of this sector to distribution increase over the two periods. Comparison across quantile, we find it is quite similar with that in 1996 which in top quantile many coefficients are insignificant.

Finally, in the last part of this section we see more detail feature of coefficients for education and agriculture in each region for both periods. We consider significant different between urban and rural area to see clearer comparison among regions. However we emphasize the analysis on regional variation as concern of this paper.

*Returns to Education*¹⁶

Returns to education are presented in Table A.1 and Table A.2 for 1996 and 2006 respectively in Appendix A and they are plotted in Figure 5. In vertical axis we put estimation of difference of $lhpce$ on additional year of education of household headed of spouse (which ever is more educated) and in horizontal axis we allocate five quantile. The base case is urban in other islands region which indicates in solid line with diamond marker. The results show not all coefficients are significant except for education in javabali region in 1996, however in each region at least one quantile is significant. Generally the patterns are the returns increase in higher quantile and Java-Bali region has the highest returns compare to the rest region in both period and across quantile. The first pattern shows education enhances level of productivity as described by Schultz (1975), Welch (1970) and the later scholars. The second pattern shows the superiority of Java-Bali compare to the rest regions, which confirm this island as centre of economic activity that attracts well educated people to come and get better reward (Nazara 2008), but this has reduced as indicated in 25th quantile, that it is insignificant in 2006.

In 1996, both patterns are very clear. In urban area, returns to education increase significantly in higher quantile, from only 0.05 in 5th quantile up to 0.09 in 95th quantile. The rest region show grouped from lower quantile to higher quantile. In rural area, the pattern is similar and the difference more clear, moreover returns of education people in javabali in highest quantile overtake the lowest quantile in urban area. Among the rest regions, other islands and Kalimantan have higher returns in the lower quantile, but in the highest quantile this difference is lower and all the rest regions have comparable returns of education. In 2006, the pattern is slightly different especially for the region outer of Java-Bali. The difference of returns is now clearer both in urban area and rural area. Overall, the returns increase in higher quantile but Sulawesi and Kalimantan have higher returns compare to Sumatera and Other Islands. This shows regional inequality in Indonesia from 1996 to 2006 is tended to increase as also found by Resosudarmo and Vidyattama (2006) and Akita (2007) among others and difference returns to education has contributed to this.

Returns to Agriculture

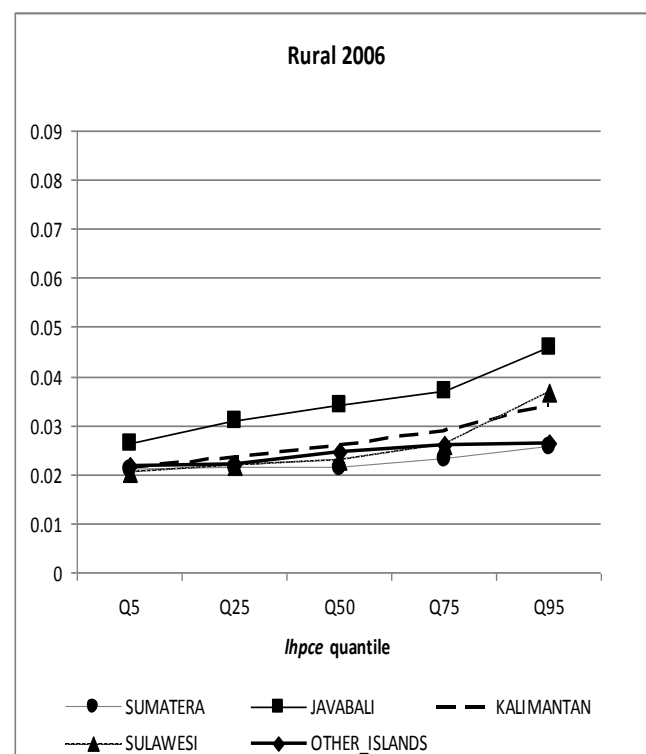
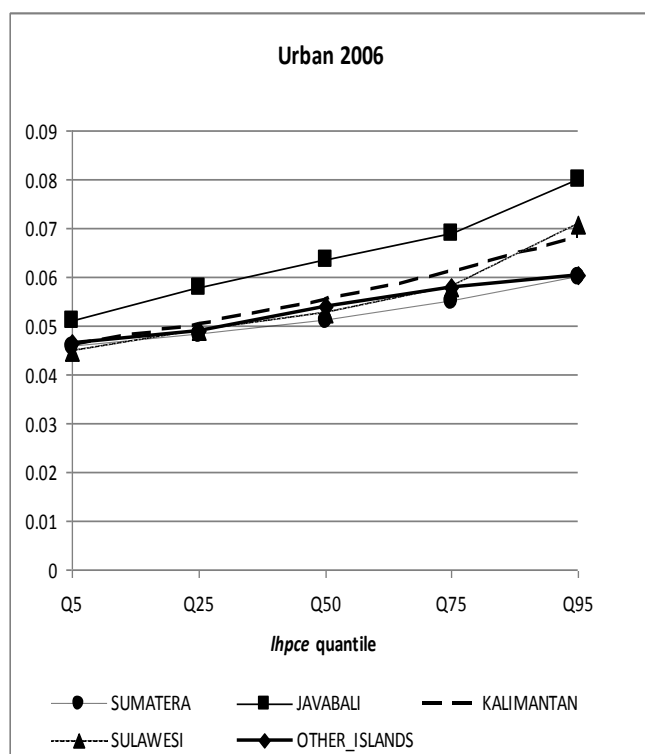
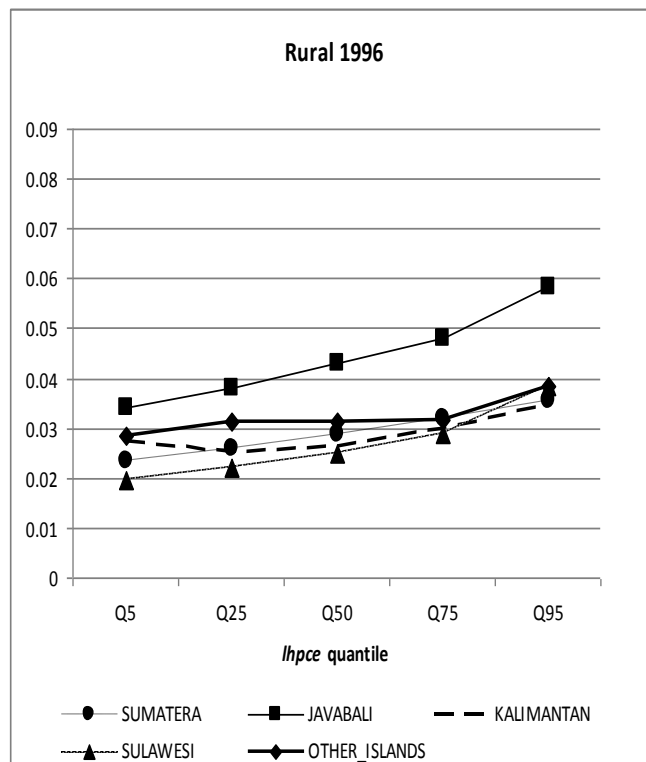
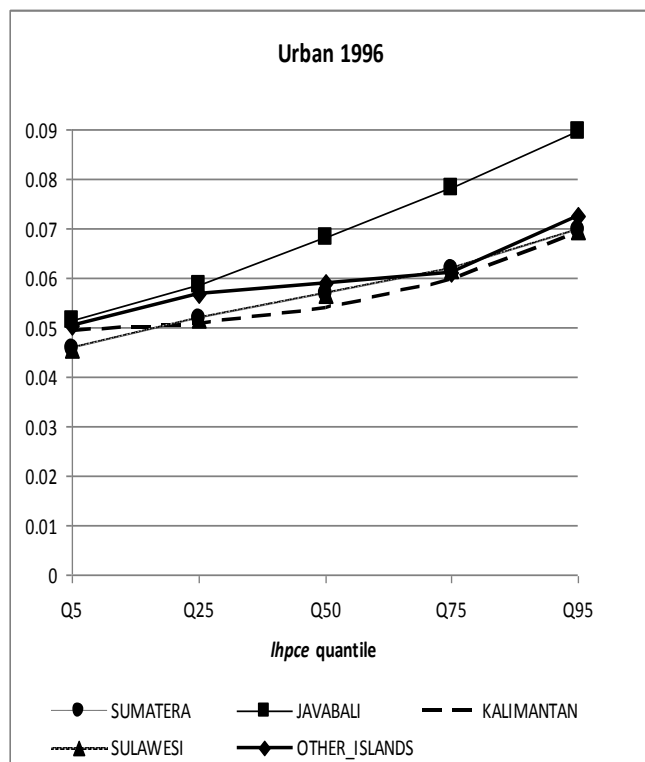
It is different with returns to education, pattern of returns to agriculture is more varied as also can be seen in table A.1 and A.2 and are plotted in Figure 6. Returns to agriculture in Kalimantan are the highest among the regions and consistent in urban/rural area and in both period. It is the case may be due to

¹⁶ Calculation of each return as follow: the return of other islands covariate in rural area are found by adding other islands differential to the coefficient of other islands in urban area (base case) on the covariate; the return of other regions covariate in urban area are found by adding the each region differential to the base coefficient; the return of other regions in rural are found by adding the rural differential and the other regions differential to the base case coefficients.

contribution of the massive exploitation of logging in this region. In 1996, the urban area of this region shows the return decreased in lowest quantile, stable from 25th quantile to 75th quantile and increase from 75th quantile to 95th quantile. This pattern is similar with the return in Sumatera, Sulawesi and other islands in urban area but other islands in rural area has a bit different pattern in which its returns increase from 5th quantile to 25th quantile and then decrease after that in higher quantile. Javabali show different patterns from the rest. In this region returns are decline from lower quantile to higher quantile and the level of decreasing is higher in rural area than in urban.

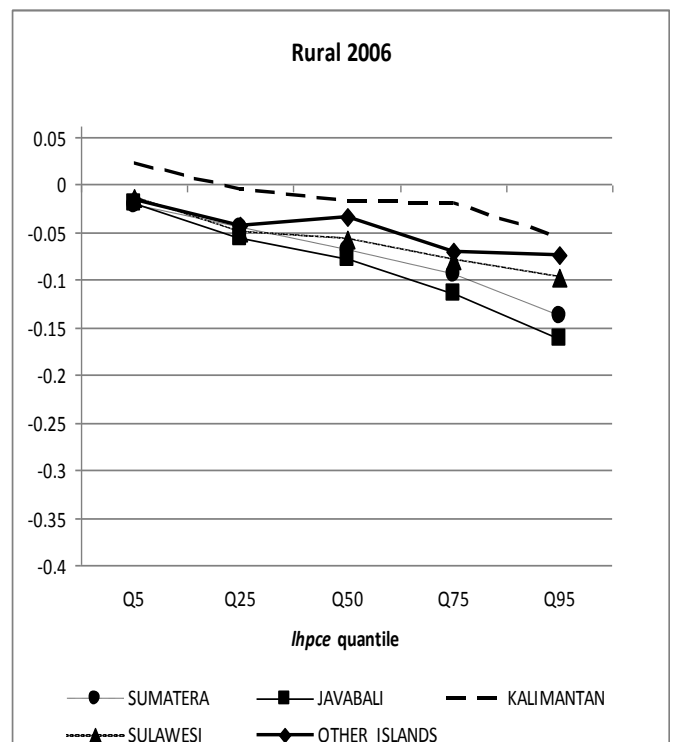
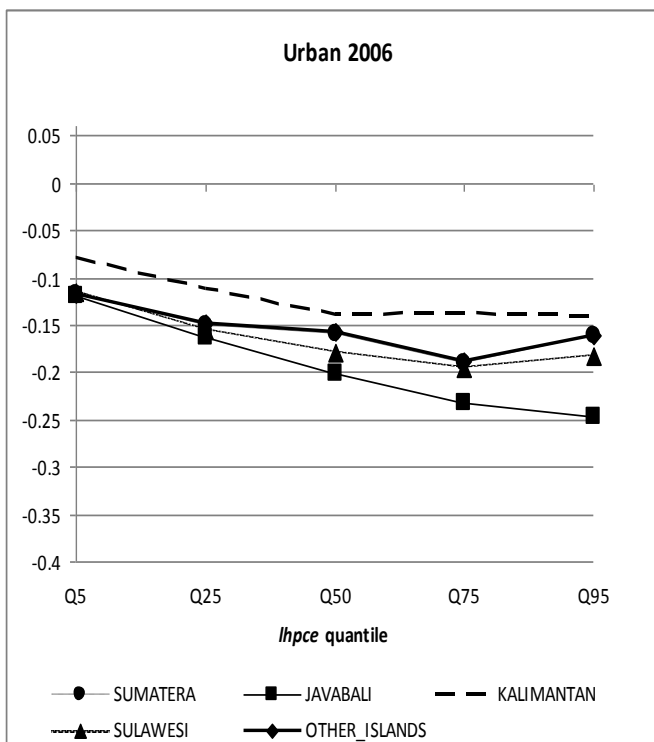
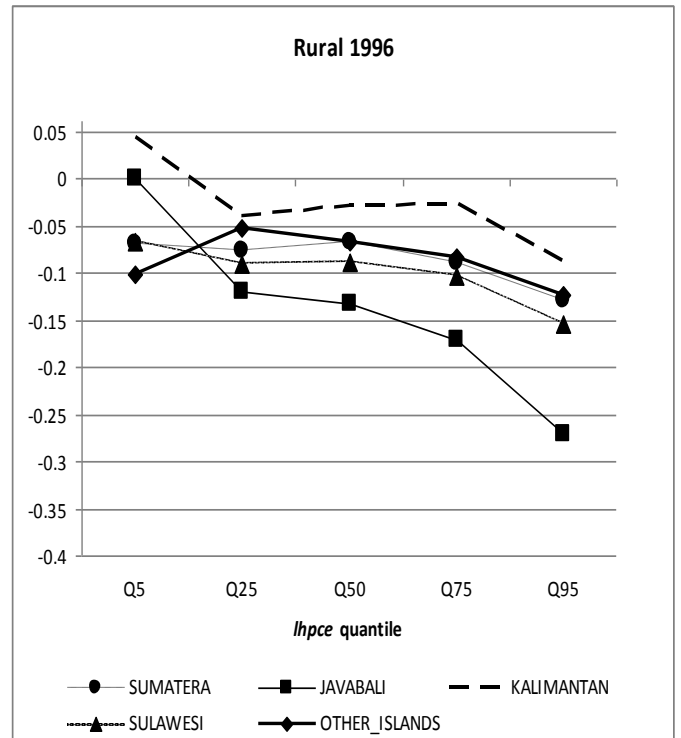
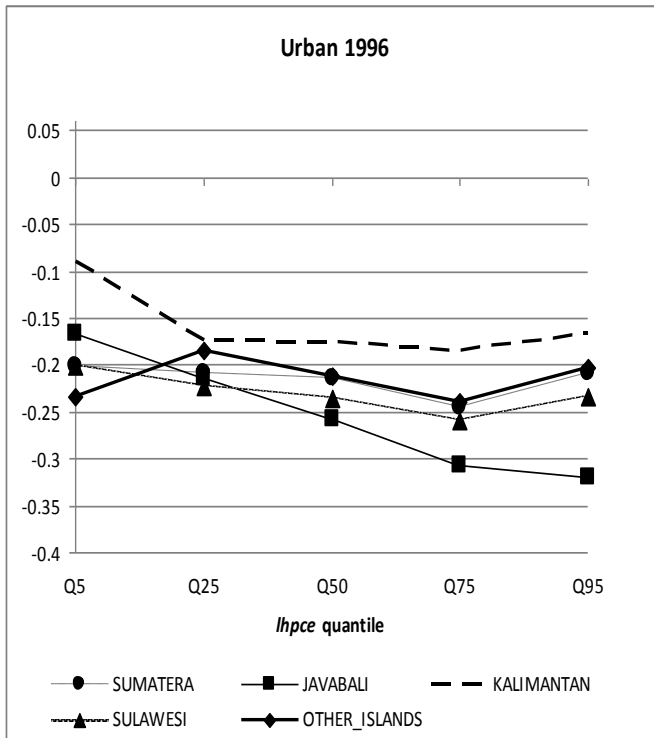
In 2006, the pattern has changed and become more flawless especially in urban area. The returns decrease from lower quantile to higher quantile but then increase in the highest quantile. Java-Bali is again different with the other regions since returns in this region consistently decreases from lower quantile to higher quantile. These patterns may due to low proportion of agriculture in this region and consequently influence of other variables to higher quantile is more.

Figure 5 Returns to Education



Source : Author calculation from Susenas 1996 and 2006

Figure 6 Returns to Agriculture



Source : Author calculation from Susenas 1996 and 2006

Chapter 5: Conclusions

In the beginning of this paper we said the objectives of this paper are to compare regional inequality in 1996 and 2006, to see influence of socio demographic characteristics to this inequality and to observe if the influence of socio demographic characteristics is varied in different level of income. Our study shows some factors such as financial crises, fiscal decentralization and increasing of oil price may have changed the pattern of regional inequality in Indonesia. Our finding also show socio demographic variables and job sectors are significant to influence the inequality across regions in both years. Even though these variables are insignificant in all quantile but this findings support our hypothesis that the variables influence the inequality differently in different point of distribution. Here we see an indication in the top quantile the magnitude of coefficient is quite different from lower quantile either in negative way (decreasing) or in positive ways (increasing).

From across regions comparison we indicate that the pattern in which Javabali is still the region that has more significant variables compared to the rest. Other islands and Kalimantan share similar pattern especially in socio demographic characteristics and some job sectors such as trade and transportation and communication while Sumatera and Sulawesi have the same returns to them, particularly in the top quantile, in job sectors, for instance in mining and construction. By our deep examination for education, we find that education has an important role to increase the regional inequality and once again especially in Java-Bali. Meanwhile, agriculture contributes to lower inequality. The pattern is similar for education in both periods while for agriculture the contribution is more consistent in 2006.

These findings illustrate the pattern picture of regional inequality has not changed from previous period in which Javabali has significant difference from the rest. Even though there is a tendency that the magnitude decreases, indicated from smaller difference of the coefficients from 1996 to 2006, the disparity is still felt in many sectors. Consequently, possibility of dissatisfied from other regions and high migration to Javabali are still high. Reducing the disparity is important to government in implementation of policy especially in education. This variable consistently create gap among the regions so we need to improve its level in outer Javabali to decrease inequality. We also suggest development of new centres of growth that is already started by the government should be continued. In this regard infrastructure projects especially in transportation and irrigation is the priority. Both are important to support importance of agriculture sectors in reducing inequality.

Appendices

Table A.1 Estimated Coefficient for Equation (1), 1996

1996	Q5		Q25		Q50		Q75		Q95	
	Coeff	std error	coeff	std error	coeff	std error	coeff	std error	coeff	std error
Hhsize	-0.119***	-0.00224	-0.115***	-0.0016	-0.113***	-0.00181	-0.116***	-0.00258	-0.123***	-0.00645
hhsz_urban	-0.00297	-0.00181	-0.00541***	-0.00126	-0.00238*	-0.00136	-0.000051	-0.00187	0.00219	-0.0042
hhsz_sumatera	0.0196***	-0.00279	0.0137***	-0.00197	0.00885***	-0.0022	0.00617**	-0.0031	0.00943	-0.00749
hhsz_javabali	0.0247***	-0.0026	0.0191***	-0.00185	0.0134***	-0.00207	0.0154***	-0.00292	0.0205***	-0.00713
hhsz_kalimantan	0.00376	-0.00357	0.000352	-0.00252	-0.00322	-0.00279	0.0000322	-0.00391	0.00341	-0.00941
hhsz_sulawesi	0.0209***	-0.00313	0.0156***	-0.00222	0.0141***	-0.00247	0.0145***	-0.00347	0.0165**	-0.00837
Age	0.0123***	-0.00169	0.00998***	-0.00106	0.0112***	-0.00105	0.0133***	-0.00132	0.0118***	-0.00268
age_urban	-0.00265	-0.00171	-0.00234**	-0.00112	-0.00219**	-0.00111	-0.000957	-0.00137	0.00032	-0.00268
age_sumatera	0.0106***	-0.00171	0.0109***	-0.00109	0.00825***	-0.00108	0.00657***	-0.00137	0.00837***	-0.00277
age_javabali	0.00300*	-0.00156	0.00347***	-0.000994	0.00193*	-0.000985	-0.000168	-0.00125	0.00297	-0.00254
age_kalimantan	0.0133***	-0.0021	0.0179***	-0.00134	0.0158***	-0.00136	0.0118***	-0.00173	0.0150***	-0.00376
age_Sulawesi	0.00643***	-0.00183	0.00610***	-0.00118	0.00240**	-0.00117	-0.000898	-0.00148	-0.0000832	-0.00297
Agsq	-0.00742***	-0.00203	-0.00514***	-0.00124	-0.00652***	-0.00121	-0.00915***	-0.00152	-0.00617**	-0.00303
agsq_urban	0.00269	-0.0018	0.00262**	-0.00117	0.00260**	-0.00115	0.00188	-0.00142	0.00237	-0.00276
agsq_sumatera	-0.0115***	-0.00213	-0.0114***	-0.00134	-0.00793***	-0.00132	-0.00572***	-0.00167	-0.00982***	-0.0033
agsq_javabali	-0.00477**	-0.00195	-0.00526***	-0.00123	-0.00298**	-0.00121	0.000102	-0.00151	-0.00375	-0.00302
agsq_kalimantan	-0.0143***	-0.00262	-0.0198***	-0.00166	-0.0171***	-0.00168	-0.0122***	-0.00214	-0.0178***	-0.00463
agsq_Sulawesi	-0.00768***	-0.00227	-0.00704***	-0.00146	-0.00233	-0.00144	0.00211	-0.0018	0.000623	-0.00353
Female	-0.0814***	-0.019	-0.0606***	-0.0124	-0.0607***	-0.0123	-0.0605***	-0.0151	-0.0107	-0.0299
female_urban	0.0477***	-0.0133	0.0546***	-0.00831	0.0598***	-0.00813	0.0595***	-0.00994	0.0894***	-0.019

1996	Q5		Q25		Q50		Q75		Q95	
	Coeff	std error	coeff	std error	coeff	std error	coeff	std error	coeff	std error
female_sumatera	-0.00606	-0.0228	0.00451	-0.0147	0.0153	-0.0145	0.0232	-0.0178	0.02	-0.0347
female_javabali	0.0341	-0.0212	0.0428***	-0.0137	0.0500***	-0.0135	0.0614***	-0.0166	0.0202	-0.0326
female_kalimantan	0.00438	-0.029	-0.0212	-0.0186	-0.026	-0.0184	-0.00581	-0.0225	-0.0516	-0.0436
female_Sulawesi	-0.0267	-0.026	-0.0214	-0.0166	-0.000532	-0.0163	0.00992	-0.0201	-0.0643*	-0.039
educ	0.0284***	-0.00164	0.0312***	-0.00105	0.0313***	-0.00103	0.0315***	-0.00127	0.0384***	-0.00247
educ_urban	0.0220***	-0.00108	0.0257***	-0.00071	0.0278***	-0.000723	0.0296***	-0.000926	0.0340***	-0.00193
educ_sumatera	-0.00477**	-0.00192	-0.00512***	-0.00124	-0.00244**	-0.00122	0.000508	-0.00152	-0.00286	-0.00301
educ_javabali	0.00572***	-0.00178	0.00687***	-0.00115	0.0117***	-0.00113	0.0167***	-0.0014	0.0200***	-0.00276
educ_kalimantan	-0.00115	-0.00234	-0.00604***	-0.00152	-0.00515***	-0.00153	-0.00146	-0.0019	-0.00358	-0.00381
educ_sulawesi	-0.00880***	-0.00213	-0.00924***	-0.00136	-0.00627***	-0.00134	-0.0026	-0.00166	0.00000306	-0.00323
Agri	-0.101***	-0.0238	-0.0534***	-0.0154	-0.0666***	-0.0152	-0.0836***	-0.0189	-0.124***	-0.0372
Agri_urban	-0.133***	-0.0173	-0.132***	-0.011	-0.146***	-0.0108	-0.156***	-0.0132	-0.0792***	-0.0252
Agri_sumatera	0.0327	-0.0274	-0.0225	-0.0177	-0.000795	-0.0174	-0.00553	-0.0218	-0.00534	-0.0424
Agri_javabali	0.0684***	-0.0257	-0.0290*	-0.0166	-0.0445***	-0.0163	-0.0666***	-0.0202	-0.116***	-0.0391
Agri_kalimantan	0.145***	-0.0346	0.0126	-0.0222	0.0368*	-0.0221	0.0559**	-0.0277	0.0369	-0.0562
Agri_Sulawesi	0.0333	-0.03	-0.0369*	-0.0194	-0.0223	-0.019	-0.0199	-0.0236	-0.0304	-0.0454
mining	-0.0655	-0.0574	-0.031	-0.0376	-0.0201	-0.0368	0.0391	-0.0442	0.282***	-0.0802
mining_urban	0.0393	-0.0359	0.0709***	-0.0227	0.0904***	-0.0222	0.0922***	-0.0272	0.136**	-0.0529
mining_sumatera	0.172***	-0.0641	0.0892**	-0.0416	0.0551	-0.0409	0.0245	-0.0503	-0.095	-0.0956
mining_javabali	0.067	-0.0629	-0.00962	-0.0411	-0.0609	-0.0403	-0.113**	-0.0491	-0.416***	-0.0917
mining_kalimantan	0.179**	-0.0705	0.0962**	-0.0461	0.114**	-0.0454	0.0981*	-0.0557	-0.190*	-0.105
mining_Sulawesi	0.0535	-0.0761	0.0506	-0.0499	0.0731	-0.0491	0.0942	-0.0598	-0.13	-0.111
Processing	0.143***	-0.0409	0.123***	-0.0264	0.0839***	-0.0258	0.0618*	-0.0316	0.00449	-0.0605
Processing_urban	-0.0659***	-0.0198	-0.102***	-0.0126	-0.120***	-0.0124	-0.118***	-0.0152	-0.0236	-0.0288
Processing_sumatera	-0.0880*	-0.0463	-0.0682**	-0.0298	-0.00649	-0.0291	0.0264	-0.0357	0.0953	-0.0682

1996	Q5		Q25		Q50		Q75		Q95	
	Coeff	std error	coeff	std error	coeff	std error	coeff	std error	coeff	std error
Processing_javabali	-0.101**	-0.0429	-0.106***	-0.0276	-0.0695***	-0.0269	-0.0868***	-0.033	-0.121*	-0.0631
Processing_kalimantan	-0.0214	-0.0528	-0.016	-0.0337	0.0672**	-0.0332	0.1000**	-0.0409	0.0876	-0.0795
Processing_Sulawesi	-0.149***	-0.0508	-0.124***	-0.0326	-0.0677**	-0.0319	-0.0474	-0.0391	-0.0239	-0.0739
EGW_urban	-0.147**	-0.0571	-0.140***	-0.0373	-0.143***	-0.0368	-0.146***	-0.0444	-0.285***	-0.0822
EGW_sumatera	0.0537	-0.11	-0.111	-0.0782	-0.0727	-0.0774	-0.0573	-0.0945	0.324**	-0.162
EGW_javabali	-0.0842	-0.106	-0.203***	-0.0752	-0.148**	-0.0743	-0.121	-0.0903	0.115	-0.156
EGW_kalimantan	0.0476	-0.134	-0.0777	-0.0946	-0.000506	-0.0935	0.0931	-0.113	0.328*	-0.199
EGW_Sulawesi	-0.203	-0.128	-0.301***	-0.0892	-0.209**	-0.089	0.0579	-0.108	0.397**	-0.19
construction	0.154***	-0.0401	0.111***	-0.0257	0.0669***	-0.0253	0.0624**	-0.0312	0.0387	-0.0591
construction_urban	-0.146***	-0.0213	-0.129***	-0.0137	-0.140***	-0.0134	-0.117***	-0.0165	0.00422	-0.0316
construction_sumatera	-0.0548	-0.0453	-0.039	-0.0289	0.0131	-0.0284	0.0000625	-0.0351	-0.0276	-0.0664
construction_javabali	-0.103**	-0.0417	-0.104***	-0.0267	-0.0737***	-0.0262	-0.110***	-0.0322	-0.183***	-0.0608
construction_kalimantan	-0.0264	-0.0534	-0.0316	-0.0341	-0.000758	-0.0337	-0.0334	-0.0416	-0.0318	-0.0806
construction_Sulawesi	-0.101**	-0.0513	-0.105***	-0.0329	-0.0555*	-0.0323	-0.025	-0.0397	-0.0688	-0.0749
trade	0.216***	-0.0326	0.201***	-0.0208	0.220***	-0.0203	0.237***	-0.025	0.346***	-0.047
trade_urban	-0.0873***	-0.0165	-0.110***	-0.0105	-0.114***	-0.0103	-0.105***	-0.0126	-0.0578**	-0.024
trade_sumatera	-0.109***	-0.0359	-0.0831***	-0.0228	-0.0830***	-0.0224	-0.0750***	-0.0275	-0.101*	-0.0518
trade_javabali	-0.117***	-0.0338	-0.107***	-0.0215	-0.127***	-0.021	-0.147***	-0.0258	-0.284***	-0.0484
trade_kalimantan	-0.0255	-0.0435	-0.0401	-0.0279	-0.0435	-0.0276	-0.0235	-0.034	-0.106	-0.066
trade_Sulawesi	-0.165***	-0.039	-0.103***	-0.025	-0.117***	-0.0245	-0.120***	-0.03	-0.161***	-0.056
TransCom	0.345***	-0.0427	0.266***	-0.0278	0.242***	-0.0272	0.242***	-0.0334	0.278***	-0.0641
TransCom_urban	-0.187***	-0.0213	-0.194***	-0.0137	-0.206***	-0.0134	-0.258***	-0.0165	-0.248***	-0.0315
TransCom_sumatera	-0.187***	-0.0472	-0.126***	-0.0303	-0.0933***	-0.0298	-0.0691*	-0.0367	-0.124*	-0.0702
TransCom_javabali	-0.221***	-0.0446	-0.191***	-0.0285	-0.193***	-0.0281	-0.187***	-0.0345	-0.263***	-0.066
TransCom_kalimantan	-0.139**	-0.0565	-0.117***	-0.0362	-0.0555	-0.0358	-0.023	-0.0442	-0.0793	-0.0858

1996	Q5		Q25		Q50		Q75		Q95	
	Coeff	std error	coeff	std error	coeff	std error	coeff	std error	coeff	std error
TransCom_Sulawesi	-0.246***	-0.0521	-0.202***	-0.0336	-0.145***	-0.033	-0.105***	-0.0406	-0.169**	-0.0772
Finance	0.409***	-0.11	0.496***	-0.0755	0.452***	-0.0749	0.477***	-0.0935	0.513***	-0.162
Finance_urban	-0.0245	-0.0553	-0.0723**	-0.0358	-0.0997***	-0.0355	-0.172***	-0.0434	-0.0593	-0.0813
Finance_sumatera	-0.186	-0.113	-0.350***	-0.0799	-0.300***	-0.0793	-0.252***	-0.0965	-0.272	-0.167
Finance_javabali	-0.225**	-0.102	-0.251***	-0.0732	-0.173**	-0.0726	-0.158*	-0.0886	-0.281*	-0.151
Finance_kalimantan	-0.241*	-0.132	-0.382***	-0.0935	-0.262***	-0.0925	-0.0914	-0.113	-0.253	-0.196
Finance_Sulawesi	-0.234*	-0.134	-0.274***	-0.091	-0.189**	-0.0904	-0.09	-0.11	-0.287	-0.197
services	0.186***	-0.029	0.212***	-0.0184	0.213***	-0.0181	0.225***	-0.0225	0.199***	-0.0441
services_urban	-0.145***	-0.0168	-0.170***	-0.0106	-0.192***	-0.0104	-0.209***	-0.0127	-0.185***	-0.0241
services_sumatera	-0.0557*	-0.033	-0.0705***	-0.0209	-0.0454**	-0.0205	-0.0724***	-0.0254	-0.0309	-0.0489
services_javabali	-0.0906***	-0.0309	-0.131***	-0.0195	-0.144***	-0.0191	-0.175***	-0.0236	-0.195***	-0.0452
services_kalimantan	-0.00575	-0.0408	-0.0938***	-0.026	-0.0512**	-0.0258	-0.0303	-0.032	-0.0159	-0.0636
services_Sulawesi	-0.0487	-0.0363	-0.0874***	-0.0231	-0.0730***	-0.0226	-0.0627**	-0.0279	-0.0492	-0.0532
Urban	0.304***	-0.041	0.329***	-0.027	0.328***	-0.0269	0.296***	-0.0335	0.202***	-0.0662
Urban_sumatera	-0.113***	-0.0183	-0.124***	-0.0122	-0.129***	-0.012	-0.129***	-0.015	-0.114***	-0.0294
Urban_javabali	-0.0708***	-0.0174	-0.0542***	-0.0116	-0.0245**	-0.0114	0.00698	-0.0141	0.0129	-0.0274
Urban_kalimantan	0.0109	-0.0226	-0.0101	-0.0149	-0.0172	-0.0148	-0.0107	-0.0184	-0.0345	-0.036
Urban_Sulawesi	-0.0485**	-0.0209	-0.0361***	-0.0137	-0.0378***	-0.0135	-0.0659***	-0.0167	-0.0961***	-0.0323
Constant	9.872***	-0.0223	10.26***	-0.0146	10.51***	-0.0146	10.78***	-0.0183	11.23***	-0.0359
Observations	200997		200997		200997		200997		200997	

Table A.1 Estimated Coefficient for Equation (1), 2006

2006 VARIABLES	Q5		Q25		Q50		Q75		Q95	
	coeff	std error	coeff	std error	coeff	std error	coeff	std error	coeff	std error
hhsz	-0.131***	-0.00199	-0.00129	-0.00169	-0.140***	-0.00169	-0.144***	-0.00235	-0.144***	-0.0052
hhsz_urban	-0.00129	-0.00169	0.0114***	-0.00247	-0.00147	-0.00136	0.000672	-0.00185	0.0045	-0.00387
hhsz_sumatera	0.0114***	-0.00247	0.0156***	-0.00247	0.0141***	-0.00204	0.0165***	-0.0028	0.00789	-0.00613
hhsz_javabali	0.0156***	-0.00247	0.00322	-0.00308	0.0181***	-0.00206	0.0231***	-0.00283	0.0259***	-0.00611
hhsz_kalimantan	0.00322	-0.00308	-0.00161	-0.00272	0.00431*	-0.00254	0.00861**	-0.00351	0.00927	-0.00754
hhsz_sulawesi	-0.00161	-0.00272	0.0102***	-0.0013	0.0110***	-0.00229	0.0162***	-0.00316	0.0210***	-0.00694
age	0.0102***	-0.0013	0.000318	-0.00138	0.0151***	-0.000895	0.0190***	-0.00112	0.0210***	-0.00217
age_urban	0.000318	-0.00138	0.00941***	-0.00128	-0.00254***	-0.000961	-0.00381***	-0.00118	-0.00382*	-0.00218
age_sumatera	0.00941***	-0.00128	0.000889	-0.0012	0.00608***	-0.000871	0.00326***	-0.00109	0.00388*	-0.00212
age_javabali	0.000889	-0.0012	0.0118***	-0.00159	-0.00545***	-0.000826	-0.00924***	-0.00104	-0.0125***	-0.00204
age_kalimantan	0.0118***	-0.00159	0.00532***	-0.00143	0.00676***	-0.00108	0.00162	-0.00136	0.00148	-0.00266
age_Sulawesi	0.00532***	-0.00143	-0.00722***	-0.00151	-0.00182*	-0.000962	-0.00589***	-0.0012	-0.00947***	-0.00235
agsq	-0.00722***	-0.00151	0.00184	-0.00145	-0.0122***	-0.00102	-0.0166***	-0.00128	-0.0187***	-0.00248
agsq_urban	0.00184	-0.00145	-0.00902***	-0.00159	0.00497***	-0.000987	0.00697***	-0.0012	0.00866***	-0.0022
agsq_sumatera	-0.00902***	-0.00159	-0.00175	-0.0015	-0.00526***	-0.00107	-0.002	-0.00134	-0.00205	-0.00259
agsq_javabali	-0.00175	-0.0015	-0.0119***	-0.00198	0.00533***	-0.00102	0.00987***	-0.00127	0.0140***	-0.00247
agsq_kalimantan	-0.0119***	-0.00198	-0.00462***	-0.00177	-0.00601***	-0.00134	0.000287	-0.00168	-0.000232	-0.00327
agsq_Sulawesi	-0.00462***	-0.00177	-0.0695***	-0.015	0.00315***	-0.00118	0.00786***	-0.00147	0.0113***	-0.00286
female	-0.0695***	-0.015	0.0383***	-0.0111	-0.0873***	-0.00986	-0.0816***	-0.0118	-0.0603***	-0.0216
female_urban	0.0383***	-0.0111	0.00891	-0.0177	0.0624***	-0.00706	0.0851***	-0.00847	0.119***	-0.0153
female_sumatera	0.00891	-0.0177	0.0298*	-0.0173	0.0174	-0.0115	0.00865	-0.0139	-0.0450*	-0.0252
female_javabali	0.0298*	-0.0173	-0.028	-0.022	0.0839***	-0.0112	0.0728***	-0.0135	0.0552**	-0.0245

2006 VARIABLES	Q5		Q25		Q50		Q75		Q95	
	coeff	std error	coeff	std error	coeff	std error	coeff	std error	coeff	std error
female_kalimantan	-0.028	-0.022	-0.0534***	-0.0202	0.0111	-0.0145	0.0105	-0.0174	-0.00123	-0.0314
female_Sulawesi	-0.0534***	-0.0202	0.0218***	-0.00124	0.0151	-0.0131	-0.00502	-0.0158	-0.0242	-0.0288
educ	0.0218***	-0.00124	0.0246***	-0.000909	0.0245***	-0.000809	0.0258***	-0.001	0.0263***	-0.00194
educ_urban	0.0246***	-0.000909	-0.000722	-0.00143	0.0296***	-0.000627	0.0320***	-0.000795	0.0341***	-0.00154
educ_sumatera	-0.000722	-0.00143	0.00451***	-0.00138	-0.00318***	-0.00096	-0.00285**	-0.0012	-0.000516	-0.0023
educ_javabali	0.00451***	-0.00138	-0.000417	-0.00176	0.00963***	-0.000934	0.0111***	-0.00117	0.0195***	-0.00227
educ_kalimantan	-0.000417	-0.00176	-0.0017	-0.00161	0.00133	-0.00117	0.00310**	-0.00148	0.00783***	-0.00283
educ_sulawesi	-0.0017	-0.00161	-0.0164	-0.0174	-0.00163	-0.00107	0.0000929	-0.00133	0.0102***	-0.00254
Agri	-0.0164	-0.0174	-0.100***	-0.0131	-0.0347***	-0.0117	-0.0711***	-0.0144	-0.0748***	-0.0268
Agri_urban	-0.100***	-0.0131	-0.00529	-0.0201	-0.122***	-0.00852	-0.117***	-0.0102	-0.0853***	-0.0184
Agri_sumatera	-0.00529	-0.0201	-0.00313	-0.0192	-0.0341**	-0.0135	-0.0229	-0.0165	-0.0637**	-0.0305
Agri_javabali	-0.00313	-0.0192	0.0375	-0.025	-0.0441***	-0.0129	-0.0435***	-0.0157	-0.0870***	-0.0289
Agri_kalimantan	0.0375	-0.025	0.00136	-0.0222	0.0169	-0.0167	0.0503**	-0.0206	0.0193	-0.0385
Agri_Sulawesi	0.00136	-0.0222	0.183***	-0.0388	-0.0228	-0.0148	-0.0082	-0.018	-0.0233	-0.0328
mining	0.183***	-0.0388	-0.00319	-0.0267	0.207***	-0.0259	0.209***	-0.0311	0.293***	-0.0571
mining_urban	-0.00319	-0.0267	0.0855**	-0.0425	-0.0077	-0.0177	0.0343	-0.0214	0.0522	-0.0388
mining_sumatera	0.0855**	-0.0425	-0.188***	-0.0482	0.0722**	-0.0284	0.0658*	-0.034	-0.0991	-0.0614
mining_javabali	-0.188***	-0.0482	0.0245	-0.0461	-0.246***	-0.032	-0.271***	-0.0384	-0.384***	-0.0702
mining_kalimantan	0.0245	-0.0461	-0.177***	-0.0561	-0.0562*	-0.0307	-0.0586	-0.0369	-0.146**	-0.0673
mining_Sulawesi	-0.177***	-0.0561	0.0843***	-0.0266	-0.120***	-0.0381	-0.0225	-0.0461	-0.00216	-0.0831
Processing	0.0843***	-0.0266	-0.0161	-0.0166	0.0302*	-0.0176	-0.00997	-0.0213	-0.02	-0.0384
Processing_urban	-0.0161	-0.0166	-0.0362	-0.0313	-0.0645***	-0.0108	-0.0785***	-0.0129	-0.0536**	-0.0232
Processing_sumatera	-0.0362	-0.0313	-0.025	-0.0282	0.0144	-0.0206	0.0829***	-0.025	0.0926**	-0.0453
Processing_javabali	-0.025	-0.0282	0.00242	-0.0371	-0.02	-0.0186	0.0103	-0.0226	0.0194	-0.0408
Processing_kalimantan	0.00242	-0.0371	-0.0892**	-0.0347	0.0693***	-0.0245	0.227***	-0.0297	0.233***	-0.0538

2006 VARIABLES	Q5		Q25		Q50		Q75		Q95	
	coeff	std error	coeff	std error	coeff	std error	coeff	std error	coeff	std error
Processing_Sulawesi	-0.0892**	-0.0347	0.190**	-0.0901	0.00177	-0.0229	0.0453	-0.0276	0.0738	-0.0496
EGW_urban	-0.0785	-0.0562	0.0388	-0.099	-0.0587	-0.038	-0.135***	-0.0453	-0.105	-0.0789
EGW_sumatera	0.0388	-0.099	0.0482	-0.092	-0.0687	-0.071	-0.00363	-0.0856	-0.0242	-0.143
EGW_javabali	0.0482	-0.092	0.0271	-0.105	-0.135**	-0.0669	-0.0986	-0.0805	-0.237*	-0.132
EGW_kalimantan	0.0271	-0.105	0.119	-0.115	-0.0436	-0.0755	0.0304	-0.0909	0.0371	-0.154
EGW_Sulawesi	0.119	-0.115	0.114***	-0.0286	-0.039	-0.0817	0.0327	-0.0985	-0.112	-0.162
construction	0.114***	-0.0286	-0.123***	-0.0175	0.0906***	-0.0192	0.0719***	-0.0233	-0.00927	-0.0428
construction_urban	-0.123***	-0.0175	-0.0676**	-0.0326	-0.140***	-0.0115	-0.107***	-0.0139	-0.0741***	-0.0252
construction_sumatera	-0.0676**	-0.0326	-0.0499	-0.0305	-0.0500**	-0.0216	-0.0432*	-0.0262	-0.00297	-0.0476
construction_javabali	-0.0499	-0.0305	-0.0141	-0.0386	-0.102***	-0.0202	-0.123***	-0.0244	-0.0986**	-0.0443
construction_kalimantan	-0.0141	-0.0386	-0.102***	-0.0364	-0.0314	-0.0256	-0.0187	-0.031	0.0465	-0.0566
construction_Sulawesi	-0.102***	-0.0364	0.228***	-0.0229	-0.0890***	-0.0242	-0.0983***	-0.0292	-0.013	-0.0528
trade	0.228***	-0.0229	-0.0864***	-0.0136	0.233***	-0.0155	0.256***	-0.0188	0.287***	-0.0341
trade_urban	-0.0864***	-0.0136	-0.0870***	-0.0255	-0.0899***	-0.00894	-0.0734***	-0.0108	-0.0419**	-0.0193
trade_sumatera	-0.0870***	-0.0255	-0.0884***	-0.024	-0.0700***	-0.0171	-0.0769***	-0.0207	-0.0714*	-0.0376
trade_javabali	-0.0884***	-0.024	-0.0294	-0.0307	-0.111***	-0.0161	-0.132***	-0.0195	-0.146***	-0.0352
trade_kalimantan	-0.0294	-0.0307	-0.108***	-0.0283	-0.0415**	-0.0205	-0.0264	-0.0249	-0.0611	-0.0456
trade_Sulawesi	-0.108***	-0.0283	0.167***	-0.0256	-0.0698***	-0.019	-0.0793***	-0.0229	-0.0885**	-0.0411
TransCom	0.167***	-0.0256	-0.146***	-0.0169	0.179***	-0.0173	0.181***	-0.0208	0.193***	-0.0375
TransCom_urban	-0.146***	-0.0169	-0.0635**	-0.0291	-0.165***	-0.0111	-0.165***	-0.0133	-0.176***	-0.0241
TransCom_sumatera	-0.0635**	-0.0291	-0.043	-0.0276	-0.109***	-0.0194	-0.104***	-0.0235	-0.150***	-0.0424
TransCom_javabali	-0.043	-0.0276	-0.00278	-0.0358	-0.105***	-0.0183	-0.106***	-0.0221	-0.103***	-0.0399
Transcom_kalimantan	-0.00278	-0.0358	-0.107***	-0.0322	-0.0363	-0.0237	-0.0316	-0.0287	-0.0786	-0.0524
TransCom_Sulawesi	-0.107***	-0.0322	0.158*	-0.09	-0.123***	-0.0215	-0.120***	-0.0258	-0.163***	-0.0464
Finance	0.158*	-0.09	-0.0471	-0.0551	0.141**	-0.0628	0.169**	-0.0764	0.254*	-0.146

2006 VARIABLES	Q5		Q25		Q50		Q75		Q95	
	coeff	std error	coeff	std error	coeff	std error	coeff	std error	coeff	std error
Finance_urban	-0.0471	-0.0551	0.0921	-0.0942	-0.0859**	-0.0387	-0.0922**	-0.0467	-0.173**	-0.0818
Finance_sumatera	0.0921	-0.0942	0.113	-0.0848	0.206***	-0.0666	0.148*	-0.0801	0.052	-0.135
Finance_javabali	0.113	-0.0848	0.112	-0.115	0.180***	-0.0593	0.153**	-0.0716	0.0612	-0.12
Finance_kalimantan	0.112	-0.115	0.107	-0.102	0.241***	-0.0798	0.243**	-0.0957	0.137	-0.164
Finance_Sulawesi	0.107	-0.102	0.201***	-0.0225	0.0823	-0.0718	0.105	-0.0864	0.147	-0.148
services	0.201***	-0.0225	-0.0966***	-0.0149	0.235***	-0.015	0.252***	-0.0182	0.277***	-0.0338
services_urban	-0.0966***	-0.0149	-0.0438*	-0.0258	-0.161***	-0.00957	-0.185***	-0.0115	-0.163***	-0.0207
services_sumatera	-0.0438*	-0.0258	-0.0533**	-0.0241	-0.0259	-0.0169	-0.0204	-0.0205	-0.0618	-0.0377
services_javabali	-0.0533**	-0.0241	-0.00816	-0.0312	-0.0817***	-0.0159	-0.0852***	-0.0192	-0.117***	-0.0352
services_kalimantan	-0.00816	-0.0312	-0.0811***	-0.0286	-0.0293	-0.0204	-0.0117	-0.0248	-0.014	-0.046
services_Sulawesi	-0.0811***	-0.0286	0.160***	-0.0335	-0.018	-0.0187	-0.0165	-0.0226	-0.0820**	-0.0413
U	0.160***	-0.0335	-0.198***	-0.0129	0.284***	-0.0233	0.268***	-0.0289	0.254***	-0.0543
U_sumatera	-0.198***	-0.0129	-0.0969***	-0.0125	-0.242***	-0.00906	-0.219***	-0.0111	-0.250***	-0.0204
U_javabali	-0.0969***	-0.0125	-0.121***	-0.0155	-0.0738***	-0.00869	-0.0321***	-0.0106	-0.0672***	-0.0195
U_kalimantan	-0.121***	-0.0155	-0.0701***	-0.015	-0.128***	-0.0107	-0.102***	-0.0131	-0.123***	-0.0241
U_Sulawesi	-0.0701***	-0.015	11.59***	-0.0201	-0.155***	-0.0104	-0.153***	-0.0127	-0.228***	-0.0234
Constant	11.59***	-0.0201	0	0	12.17***	-0.0139	12.42***	-0.0172	12.85***	-0.0321
Observations	277200		277200		277200		277200		277200	

References

- Albertini, Marco (2008). 'Equalizing or Not? The Effect of Changing Household Characteristics on Income Inequality'. *European Sociological Review* 24(3):285-298.
- Alesina, Alberto and Dani Rodrik. (1994). 'Distributive Politics and Economic Growth', *Quarterly Journal of Economics*. 109(2): 465-490.
- Akita, T. and Lukman, R.A. (1995) 'Interregional inequalities in Indonesia: a sectoral decomposition analysis for 1975–92', *Bulletin of Indonesian Economic Studies* 31 (2): 61–81.
- Akita T., RA Lukman and Y. Yamada (1999). 'Inequality in the distribution of household expenditure in Indonesia: a Theil decomposition analysis'. *The Developing Economies* 37(2):197-221.
- Akita, T. and Armida S. Alisjahbana. (2002) 'Regional Income Inequality in Indonesia and The Initial Impact of The Economic Crisis', *Bulletin of Indonesian Economic Studies* 38 (2): 201–22.
- Akita, Takahiro (2003). 'Decomposing Regional Income Inequality in China and Indonesia using Two-Stage Nested Theil Decomposition Method'. *The Annals of Regional Science* 37:55-77.
- Athukorala, Prema-chandra (2006) 'Post Crisis Export Performance: the Indonesian Experience in Regional Perspective', *Bulletin of Indonesian Economic Studies* 42 (2): 177–211.
- Azis, I. J. (2006) 'A Drastic Reduction of Fuel Subsidies Confuses Ends and Means'. *ASEAN Economic Bulletin* 23(1): 114–36.
- Azis, I.J. (2008) 'Indonesia's Slow Recovery after Meltdown', *Asian Economic Papers* 7 (1): 79-103.
- Brodjonegoro, Bambang (2004), 'Three Years of Fiscal Decentralization in Indonesia : Its Impacts on Regional Economic Development and Fiscal Sustainability'. Presented at the International Symposium on Decentralization in Asian Countries Hitoshubashi University, Tokyo Japan.
- Bulman, Tim, Wolfgang Fenger and Mohammad Ikhsan (2008), 'Indonesia's Oil Subsidy Opportunity', *Far Eastern Economic Review*; 171(5): 14
- Burtless, Gary. 1995. "International Trade and the Rise in Earnings Inequality." *Journal of Economic Literature* 33:800-16.
- Chakraborty, Biman (2001). 'On Multivariate Quantile Regression'. *Journal of Statistical Planning and Inference* 110:109-132.
- Chaudury, P (1996) 'On a Geometric Notion of Quantile for Multivariate Data. *J.Arner Statist. Assoc* 91:862-872.
- Clarke, George (1995) 'More Evidence on Income Distribution and Growth'. *Journal of Development Economics* 47:403-427.
- Davies, J. B. and I. Wooton. (1992). "Income inequality and international migration" *The Economic Journal* 102:789–802.
- Deaton, A. (1997), *The Analysis of Household Surveys*. Baltimore, MD: Johns Hopkins University Press.
- Dickey, Heather (2007). Regional Earnings Inequality in great Britain: Evidence from Quantile Regressions?. *Journal of Regional Science* 47(4): 775-806.
- Etharina, (2005), 'Disparitas Pendapatan Antaradaerah di Indonesia', *Jurnal Kebijakan Ekonomi* Vol 1, No. 1 Agustus 2005.

- Fane, George (1975) 'Education and the Managerial Efficiency of Farmers'. *Review of Economics and Statistics* 57:452-61.
- Fitzsimons, E. (2003). The Effects of Risk on Education and Child Labour, Working Paper W02/07, Institute for Fiscal Studies.
- Forbes, Kristin J. (2000) 'A Reassessment of the Relationship Between Inequality and Growth'. *The American Economic Review* 90(4):869-887.
- Frankenburg, Elizabeth, Duncan Thomas and Kathleen Beegle (1999) 'The Real Cost of Indonesia's Economic Crisis: Preliminary Findings from the Indonesia Family Life Surveys. Labor and Population Program working Paper Series 99-04. RAND.
- Friedman, J. and Levinsohn, J. (2002). "The Distributional Impact of Indonesia's Financial Crisis on Household Welfare: a "Rapid Response" Methodology", *The World Bank Economic Review*, Vol. 16, pp. 397-423.
- Geraci and Matteo Bottai (2006). 'Quantile Regression for Longitudinal Data Using the Asymmetric Laplace Distribution'. *Biostatistics* 8(1):140-154.
- Gustafsson, B. and M. Johansson. (1997). 'In Search for a Smoking Gun: What Makes Inequality Vary Over Time in Different Countries. Luxembourg Income Study' working papers, No. 172, Luxembourg: Luxembourg Income Study.
- Hill, Hal (2000). 'The Challenge of Regional Development in Indonesia'. *Australian Journal of International Affairs* 52(1):19-34.
- Jamison Dean T. and Lawrence J. Lau (1982) *Farmer Education and farm Efficiency*. Washington DC: World Bank.
- Jolliffe, J., 2002. Whose Education Matters in the Determination of Household Income? Evidence from a Developing Country. *Economic Development and Cultural Change* 50 (2):287-312.
- Hastuti et al., (2006) 'A Rapid Appraisal of the Implementation of the 2005 Direct Cash Transfer Program in Indonesia: A Case Study in Five Kabupaten/Kota'. SMERU Research Report. Jakarta: The SMERU Research Institute.
- Hirawan, Susiyati Bambang (2007). 'Desentralisasi fiscal sebagai upaya meningkatkan penyediaan layanan public (bagi orang miskin) di Indonesia' Professor Speech Inauguration. Jakarta: Universitas Indonesia 24 February.
- Hugo, Graeme (2000). 'The Impact of the Crises on Internal Population Movement in Indonesia'. *Bulletin of Indonesian Economic Studies* 36(2):115-38.
- Hulu, E. and G.J.D. Hewings (1993) 'The Development and Use of Interregional Input-Output for Indonesia under Conditions of Limited Information'. *Review of Urban and Regional Development Studies* 5:135-153.
- Ikhsan, Mohammad et al. (2005) 'Kajian Dampak kenaikan BBM 2005 terhadap kemiskinan (Study impact of oil increasing price in 2005 on poverty), Working paper, No. 10, LPEM.
- Jurajda, S., (2003). 'Gender Pay Gap and Segregation in Enterprises and the Public Sector in Late Transition Economies'. *Journal of Comparative Economics* 31, 199-222.
- Kim, Tae-Hwan and Christophe Muller (2004) 'Two-Stage Quantile Regression When the First Stage is Based on Quantile Regression'. *Econometrics Journal* 7:218-231.
- Koenker, R. and G. Bassett (1978) Regression Quantiles, *Econometrica*, 46(1): 33-50.
- Koenker, R. and Hallock, K. (2001) Quantile Regression: an Introduction, *Journal of Economic Perspectives*, 15:143-156.
- Koenker, R., & Xiao, Z. (2002). Inference on the quantile regression process. *Econometrica*, 70: 1583-1612.

- Koenker, Roger (2003). 'Quantile Regression for Longitudinal Data'. *Journal of Multivariate Analysis* 91:74-89.
- Kuncoro, Ari and J. Vernon Henderson (2006). Corruption in Indonesia.
- Larrimore, Jeff (2009). 'The Impact of Changing Earnings Distribution and Household Characteristics on US Income Inequality trends since 1967.
- Levy, Frank and Richard J. Murnane. 1992. "U.S. Earnings Levels and Earnings Inequality: A Review of Recent Trends and Proposed Explanations." *Journal of Economic Literature* 30: 1333-81.
- Liu, A. Y. C. (2004a). Gender pay gap in Vietnam: 1993–1998. *Journal of Comparative Economics*, 32(3):586–596.
- Machado, J. and Mata, J. (2005) Counterfactual decomposition of changes in wage distributions using quantile regression, *Journal of Applied Economics*, 20(4):4445–465.
- Milanovic, Branko, 2004, *Worlds Apart: Global and International Inequality 1950-2000*, Princeton University Press, forthcoming.
- Nazara, Suahasil (2010), Pemerataan antar Daerah sebagai Tantangan Utama Transformasi Struktural Pembangunan Ekonomi Masa Depan'. Professor Speech Inauguration. Jakarta: Universitas Indonesia: 10 Maret.
- Newell, A., & Reilly, B. (2001). 'The Gender Pay Gap in the Transition from Communism: Some Empirical Evidence. IZA Discussion Paper No. 268, Bonn, Germany.
- Nguyen Nint T, James W. Albretch, Susan B. Vroman and M. Daniel Westbrook, (2007) "A Quantile Regression Decomposition of Urban-Rural Inequality in Vietnam", *Journal of Development Economics*, 83 :466-490.
- Persson, torsten and Guido Tabellini. (1994). 'Is inequality Harmful for Growth?' *American Economic Review*. 84 (3): 600-621.
- Pham. T.H. and B. reilly (2007), 'The gender Pay gap in Vietnam, 1993-2000: A Quantile Regression Approach'. *Journal of Asian Economics* 8(8):775-806.
- Ray, Debraj (1998), *Development Economics*, Princeton University Press, Princeton, New Jersey.
- Ravallion, Martin. 2001. "Growth, Inequality and Poverty: Looking beyond Averages." *World Development* 29, No. 11:1803–15.
- Ravallion, Martin. 2003. "The Debate on Globalization, Poverty and Inequality: Why Measurement Matters," Working Paper No. 3038, April, Washington D.C.: The World Bank.
- Ravallion, Martin and Michael Lokhsin (2004), 'Lasting Local Level Impacts of a Crisis, Policy Research Working Paper 3503, World bank Washington DC.
- Resosudarmo, Budi P. and Yogi Vidyattama (2006) 'Regional Income Disparity in Indonesia: A Panel Data Analysis', *ASEAN Economic Bulletin* 23(1): 31-44.
- Richardson, J. David. 1995. "Income Inequality and Trade: How to Think, What to Conclude." *Journal of Economic Perspectives* 9:33-55.
- Schultz, Theodore W. (1975) 'The Value of the Ability to Deal with Disequilibria', *Journal of Economic Literature* 13:827-46.
- Sigit, Hananto. 1985. 'Income Distribution and Household Characteristics.' *Bulletin of Indonesian Economic Studies* 21(3): 51–68.
- Sparrow, Robert (2007). 'Protecting Education for the Poor in Times of Crisis: an Evaluation of a Scholarship Programme in Indonesia'. *Oxford Bulletin of Economics and Statistics* 69(1): 99-122.

- Sugema, I., M. Hasan, R. Oktaviani, Aviliani and H. Ritonga. "Dampak Kenaikan Harga BBM dan Efektivitas Program Kompensasi". Working Paper, 2005. *INDEF*. Accessed 18 July 2010. <<http://www.indef.or.id/download/pubs/BBM.PDF>>.
- Sumarto, Sudarno, Anna Wettenberg and Lant Pritchett (1999). The Social Impact of the Crisis in Indonesia: Results from a Nationwide Kecamatan Survey. Accessed 17 July 2010. <<http://www.smeru.or.id/report/workpaper/crisimpactkecsurv/kecsur1.pdf>>
- Suryadarma, Daniel, Wenefrida Widyanti, Asep Suryahadi and Sudarno Sumarto (2006) "From Access to Income : Regional and Ethnic Inequality in Indonesia", Jakarta: SMERU Research Institute.
- Swastyardi, Drisnaf (2008). Regional Inequality in Indonesia: SI the general allocation fund (DAU) likely to have an Impact?. MA Thesis. The Hague: Institute of Social Studies.
- Todaro, Michael and Stephen C. Smith (2009), *Economic Development tenth edition*, Pearson Education.
- Welch, Finis (1970), 'Education in Production', *Journal of Political Economy* 78:35-59.
- Wu, C.C. (1977) 'Education in Farm Production: The Case Of Taiwan'. *American Journal of Agricultural Economics* 59:699-709.
- Yusuf, Arief Anshory and Budy P. Resosudarmo (2008), 'Mitigating Distributional Impact of Fuel Pricing Reform: The Indonesian Experience', *ASEAN Economic Bulletin* 25 (1): 32-47.
- Zou, Heng-fu and Hongyi Li (1998), Income Inequality is not Harmful for Growth: Theory and Evidence, *Review of Development Economics* 2:318-334.