Income Mobility in Indonesia in Pre and Post Monetary Crisis 1998 and the Determinants

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Abstract

Indonesia experienced monetary crisis in 1998 which triggered political reform and affected economic structure aftermath. This paper aims to estimate income mobility in Indonesia before and after monetary crisis in 1998 and analyse the factors which determine income mobility in that both periods. Methodology for income mobility measures used in this paper are Gini mobility index of Yitzhaki and Wodon(2002) and decomposition of change in inequality of Jenkins and Van Kerms(2006). To analyse the determinants of income mobility, this paper applies a model of income change and positional change on education level, work experience, job sector, job status and individual characteristics. Data source for this paper is Indonesian Family Life Survey from 1993 to 2007 with individual panel data .

Keywords: income mobility, inequality

1 Introduction

Monetary crisis in 1998 which caused negative economic growth in Indonesia and increasing in poverty rate drastically. In the period of crisis, poverty rate increased drastically but inequality was lower. Several year after the crisis, poverty rate showed decreasing trend while inequality was increasing. The political movement caused by the crisis, encouraged Indonesia to become more democratic country as the result of political reform.

This situation raised the expectation of more fair economic opportunity for the society. Income mobility is a measure that can indicate change in economic opportunity. To understand how the different the economic opportunity before and after monetary crisis, it is important to estimate the income mobility of both periods and the differences in the determinants of income mobility .

Various approaches have been introduced in income mobility discussions. For this study, methodology for income mobility measure is using Gini mobility index of Yitzhaki and Wodon(2002) and decomposition of change in inequality of Jenkins and Van Kerms(2006). Gini mobility index is an income mobility measure which account for exchange of ranking or position and income change between two periods. Decomposition of change in inequality explains re-ranking and income growth contribution to change in inequality.

In the analysis the determinants of income mobility, this paper adopting the model in Field et al (2003). The difference of the model used in this paper to Field's model are instead of using household per capita expenditure for income change and, head of household characteristics, this study uses individual income, education level, work experience, job sector, job status and individual characteristics. In addition, to capture determinant of re-ranking, positional change in term of percentile position of income is regressed on individual income in initial yearl income, education level, work experience, job sector, job status and individual characteristics

Data source for this chapter is four waves of Indonesian Family Life Survey (IFLS) from 1993 to 2007 with individual panel data .In order to make the data comparable, monetary values in the data is adjusted based on 2010 provincial consumer price index.

2 Methodology

2.1 Mobility measures

2.1.1 Gini mobility index

Yitzhaki and Wodon (2002) introduced Gini mobility index which provides overall framework of income inequality and income mobility as an alternative to transition matrix approach in measuring income mobility. Gini mobility index links change in incomes and rank between two periods The mobility index relates distribution in period 1 and 2 with index symbol is S_{12}. Symmetric index means S_{12} is similar as S_{21} and ignores directional element of income changes. The formula consists of income in initial year and final year, Y_1 and Y_2, (marginal) cumulative distribution in initial year and final year, $F_1(Y)$ and $F_2(Y)$

The formula of symmetric Gini mobility index is:

$$S_{12} = \frac{COV[(Y_1 - Y_2),(F_1(Y) - F_2(Y))]}{COV([Y_1,F_1(Y))COV(Y_2,F_2(Y)]}$$

2.1.2 Decomposition of Change in Inequality

Decomposition of change in inequality of Jenkins and Van Kerms(2006) is concept of income mobility measurement by decomposing change in inequality into re-ranking and progressivity Re-ranking is the income mobility part and progressivity is a factor that reduce inequality. Gini coefficient adopted in this concept is Generalized Gini (S-Gini) of Donaldson and Weymark(1980,1983) and Yitzhaki(1983). with degree of aversion of society(v) If degree of aversion of society(v) is two or more, the poorer individuals given more weight in the index estimation.

Inequality change in this concept is the difference of S-Gini between initial and final years for same individuals in the population. Change in S-Gini is related to change in relative income of individuals and their ranking or social weight, and decomposition of

S-Gini change is derived from concentration curve. Re-ranking part is the difference between social weight in the initial and final years associated with relative income in final year Progressivity of income growth comes from the different of relative income between initial and final years, associated with the social weight or rank in initial year.

Formula for the decomposition of change in inequality is :

$$\Delta G(\upsilon) = R(\upsilon) - P(\upsilon)$$

where $\Delta G(\upsilon)$ is the change in S-Gini coefficient, $R(\upsilon)$ is the index of mobility in the form of re-ranking and $P(\upsilon)$ is the progressivity of income growth

Formula for progressivity of income growth and re-ranking are:

$$P(\upsilon) = \int_{-z}^{+z} \int_{-z}^{+z} w(F_0(x); \upsilon)[\tfrac{y}{\mu_1} - \tfrac{x}{\mu_0}]h(x,y)dydx$$
$$R(\upsilon) = \int_{-z}^{+z} \int_{-z}^{+z} [w(F_0(x); \upsilon) - w(F_1(x); \upsilon)][\tfrac{y}{\mu_1}]h(x,y)dydx$$

where x is income in initial year and y is income in final year. Lowest value of x in initial year or y in final year distributions is represented by $-z$ and $+z$ is highest value of x in initial year or y in final year distributions. μ_0 and μ_1 are mean income of initial year and final year respectively. $h(x,y)$ is joint probability density function, $w(F_0(x); \upsilon)$ is social weight of initial year income and $w(F_1(x); \upsilon)$ is social weight of final year income

2.2 Determinants of income mobility

Based on income mobility measurement, ranking and income change or growth are important in defining income mobility. This study uses income change and positional change to determine factors affecting income mobility. Adopting the model in Field et al (2003) with Ordinary Least Square model, this study uses individual income, education level, work experience, job sector, job status and individual characteristics. In addition, to capture determinant of re-ranking, positional change in term of percentile

position of income is regressed on individual income in initial year, change in individual characteristics and final year individual characteristics.

$$\ln y_{it} - \ln y_{i,t-1} = \alpha \ln y_{i,t-1} + \beta_1 Educ + \beta_2 Exper + \beta_3 Sector + \beta_4 JobStat + \beta_5 X_i + \varepsilon_{it}$$

Where $\ln y_{it}$ is natural logarithm of income in final year of individual i and $\ln y_{i,t-1}$ is natural logarithm of income in initial year of individual i. *Educ.*is education level of individual i in final year and work experience is represented in $Exper$. $Sector$ is job sector of individual i and $JobStat$ is status of employment of individual i. Individual i characteristics in final year is X_i which consists of marital status, age, gender and household size and ε_{it} is random error term

To estimate the determinants of mobility in terms of position in income distribution, the model is applied on percentile difference between final and initial year as an approach to capture the determinant of mobility based on positional movement The model for percentile movement is :

$$p_{it} - p_{i,t-1} = \alpha p_{i,t-1} + \beta_1 Educ + \beta_2 Exper + \beta_3 Sector + \beta_4 JobStat + \beta_5 X_i + \varepsilon_{it}$$

Where p_{it} is percentile in income rank of individual i's income in final year and $p_{i,t-1}$ is percentile in income rank of individual i's income in initial year

3 Data

IFLS is a longitudinal survey collects socio-economic and health information with the sample of households in 13 provinces which represents 83% of the Indonesian population. The selection of the sample was at random within provinces. It covers the survey on individuals, their households and the communities in which they live. The information collected includes various data such as income, employment,health and education . The first wave (IFLS1) was administered in 1993 and 2007 IFLS is the fourth wave (IFLS4).Since this study analyses income mobility before and after monetary crisis the

data from IFLS grouped into two. Pre monetary crisis consists of the first and second waves of IFLS or 1993 and 1997 data. The third and fourth waves are included in post-monetary crisis period.

Income data used in this paper consists of salary, bonus and profit from main job with raw data without trimming or imputation. Education is categorised into four groups, primary school, junior high school, senior high school and university levels. Work experience is year of working of individuals in the observation. Job sector consist of agriculture, manufacturing, construction, trade , transportation and social service sectors. Status of job is whether the individual is self-employed, government employee or private sector employee.

4 Results

4.1 Income mobility measurement results

4.1.1 Gini mobility index

Based on the calculation results of Gini mobility index, there is no significant different between two periods of pre and post monetary crisis. According to Yitzhaki and Wodon's paper, the minimum of Gini mobility index is zero which constitutes no mobility and maximum is two where ranks are reversed totally, mid point of Gini mobility index is one. With 0.477 and 0.479 gini mobility index for pre and post monetary crisis respectively, the Gini mobility index is below mid point.

Table 1: Gini Mobility Index

	1993-1997	2000-2007
Symmetric index of mobility	0.477	0.479

Table 2: Decomposition of change in S-Gini coefficient

	1993-1997	2000-2007
Initial S-Gini	0.953	0.984
Final S-Gini	0.808	0.781
Change	-0.145	-0.203
R-component	0.419	0.454
P-component	0.565	0.656

4.1.2 Decomposition of change in S-Gini coefficient of inequality

Based on decomposition of change in S-Gini index, there is negative change in S-Gini in both periods indicating decreasing income inequality in final year. For both period, .progressivity of income growth contributes more to the change in Gini coefficient compared to re-ranking factor of income mobility. Post monetary crisis shows higher income mobility based on re-ranking component and higher income growth progressivity compared to pre monetary crisis.

4.2 Determinants of income mobility

Results from the model of determinants of income mobility are in Table3 and Table4 in the appendices. Regression results of determinant of mobility show that income in initial year has negative significant association on income difference for both periods of pre and post monetary crisis. This implies that individuals who have higher income in initial period, get lower income in final year. In terms of education level, in both periods the higher education level associated with higher income different between initial and final years, except primary school level in post-monetary crisis which does not show significant association with income different. Work experience shows very low negative association with income different in pre monetary crisis period and no significant association in the second period. For job sector, manufacture sector job shows lower income in final year for individuals who work in manufacturing in the pre-monetary crisis period. .The similar sector does not have significant association with

income change in post-monetary crisis. job sectors in agriculture and transportation have negative association with income difference in the period after monetary crisis. Self employed, government employee and private employee all have negative significant impact on income mobility before the crisis, with the least off status is self-employed individuals. After the crisis, government employee has the highest positive significant association with income change. The estimation of the model on percentile change has almost similar results with the model of income change except manufacturing sector and government employee variables which do not show significant associations with percentile different.

5 Conclusions

From the result of income mobility measurements between pre and post monetary crisis period, there is no prove that post-monetary crisis has significantly higher income mobility compared to pre-monetary crisis period. In terms of determinants of income mobility, education level has more impact in the period before the crisis and work experience shows very small negative associations with change in income in pre-monetary crisis period. In regards to job sectors, different sectors affecting income mobility of before and after monetary crisis. For the job status, government employees have better-off condition compared to other job status in both periods.

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Table 3: Determinants of income mobility on income different

	Income different	
	1993-1997	2000-2007
ln income initial year	-0.676***	-0.634***
	(0.00921)	(0.0220)
Primary school	0.182***	0.121
	(0.0303)	(0.0845)
Junior high school	0.595***	0.354***
	(0.0435)	(0.0895)
Senior high school	0.753***	0.555***
	(0.0443)	(0.0889)
University	1.030***	0.812***
	(0.0612)	(0.0974)
Work experience	-0.00260**	-0.00241
	(0.000976)	(0.00221)
Married	0.174***	0.0607
	(0.0390)	(0.0430)
Age	-0.00723***	-0.00397*
	(0.00121)	(0.00217)
Male	0.348***	0.234***
	(0.0262)	(0.0325)
hhsize	0.0478***	0.0270***
	(0.00549)	(0.00762)
Agriculture sector	-0.0298	-0.269**
	(0.0284)	(0.0913)
Manufacturing sector	-0.0896**	0.0480
	(0.0384)	(0.0877)
Construction sector	0.0673	0.222**
	(0.0608)	(0.0914)
Trade sector	0.0349	0.0695
	(0.0302)	(0.0876)
Transportation sector	-0.00938	-0.180*
	(0.0733)	(0.0994)
Social service sector	0.00868	-0.0246
	(0.0324)	(0.0845)
Self-employed	-0.465***	0.140**
	(0.0851)	(0.0519)
Government employee	-0.142	0.585***
	(0.0900)	(0.0614)
Private employee	-0.430***	0.225***
	(0.0853)	(0.0488)
_cons	8.462***	7.624***
	(0.156)	(0.282)
N	7417	5463
Rsquared	0.42	0.33

Standard errors in parentheses* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$

Table 4: Determinants of income mobility on percentile different in income distribution

Variables	Percentile different	
	1993-1997	2000-2007
Percentile initial year	-0.555***	-0.626***
	(0.0103)	(0.0157)
Primary school	5.847***	2.390
	(0.740)	(1.570)
Junior high school	14.75***	7.439***
	(0.992)	(1.785)
Senior high school	18.41***	13.67***
	(1.019)	(1.785)
University	23.49***	20.63***
	(1.348)	(2.002)
Work experience	-0.0359	-0.0269
	(0.0233)	(0.0508)
Married	3.731***	2.173**
	(0.896)	(0.952)
Age	-0.118***	-0.124**
	(0.0288)	(0.0512)
Male	6.018***	5.794***
	(0.599)	(0.769)
hhsize	0.946***	0.618***
	(0.124)	(0.184)
Agriculture sector	-0.907	-7.205***
	(0.644)	(2.106)
Manufacturing sector	-1.432	0.0891
	(0.904)	(2.019)
Construction sector	1.358	6.261**
	(1.490)	(2.220)
Trade sector	0.841	0.272
	(0.702)	(2.043)
Transportation sector	0.659	-5.320**
	(1.661)	(2.322)
Social service sector	-0.403	-1.562
	(0.756)	(1.953)
Self-employed	-9.471***	4.746***
	(1.863)	(1.233)
Government employee	-1.260	17.64***
	(1.956)	(1.542)
Private employee	-8.106***	7.465***
	(1.868)	(1.225)
_cons	23.33***	18.45***
	(2.490)	(3.293)
N	7417	5455
Rsquare	0.29	0.35

Standard errors in parentheses* $p < 0.10$, ** $p < 0.05$, *** $p < 0.001$