ECONOMIC GROWTH AND INCOME INEQUALITY IN BANGKA BELITUNG ISLAND PROVINCE PERIOD 2001-2012

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ABSTRACT

Bangka Belitung island province is known as the region that has the largest tin deposit in the world. The economic growth in this province increased during period 2001-2012. However, despite of its abundance resources, Bangka Belitung Island province has income inequality problem. The purpose of this study was to test whether the Kuznets hypothesis applies in Bangka Belitung Islands Province. The research examines panel data from 2001 to 2012. The data analysis involves economic growth, Gini index and the Kuznets hypothesis, and regression. The finding showed that the Kuznets hypothesis did not apply in the Bangka Belitung Island Province period 2001-2012. It is represented by positive linear curve which its line moves from left bottom to top right.

Keywords: Kuznets curve, economic growth, income inequality

1. INTRODUCTION

The economic growth of Indonesia has increased during the period 2001-2012. Yet, this growth does not bring significant impact to poverty eradication and income equality improvement program. On the other hand, as Kuncoro (2010: 31) points out, development process should improve the social aspect and overcome poverty and income inequality problem in the society. The importance of development impact to growth and equity is in line with the main goal of Indonesia development in 2009-2012 period which aimed to achieve nation’s prosperity through pro growth, pro job and pro poor economic growth principles (Yudhoyono & Budiono, 2009: 23).

Figure 1: Economic Growth, Poverty, and Gini Index of Indonesia Period 2001-2012

Source: Processed from the Central Bureau of Statistics (2001-2013)

Picture 1 shows that during 2001-2012 period, Indonesia economic growth was on average of 5,61%. Poverty rate dropped significantly from 9,54% in 2001 to 5,53% in 2012. However, income equality rate increased from 0,33 to 0,44. It implies that Indonesia economic development has not been equally distributed.

Indonesia economic growth problem also prevailed at provincial level including in Bangka Belitung Province. The problem was indicated by economic growth rate which was under the national economic growth rate in 2001-2012 period (see picture 2). The average economic growth in Bangka Belitung Province in 2001-2012 was at 4,9% while the national rate was at 5,61%.
However, in spite of economic growth rate improvement in Bangka Belitung Province, income inequality rate in this province, which was measured by gini index, increased steadily from 0.22 in 2001 to 0.29 in 2012. In contrast, the poverty rate decreased. Although Bangka Belitung Province gini index raised, this index was below national index during the same period which was at 0.33 and 0.41 in 2001 and 2012 respectively. Thus, it indicates that income inequality rate in Bangka Belitung Province was below income inequality national number (see picture 3).

In term of its poverty issue, poverty rate in Bangka Belitung Province was under the national average rate (see picture 4). In 2012, there were 5.7% poor people in this province. The percentage decreased significantly from 2001 rate which was at 13.28% (see figure 5).
This condition encouraged the government to improve economic growth quality in order to prevent developmental problems such as social conflict and violence which occur many times in Indonesia (Kuncoro, 2013:98).

This observation shows that economic growth in Bangka Belitung Province fluctuated during the period of 2001 to 2012. In contrast, income disparity, which is measured by gini index, grew in the same period of time and the poverty number decreased below national poverty percentage. It demonstrates that higher economic growth coincided with lower poverty rate in Bangka Belitung Province during the period of 2001-2012 but the disparity between the rich and poor groups prevailed in this time frame.

This research aims to address two research problems as follows; firstly, how does economic growth correlate to income inequality in Bangka Belitung Province? Secondly, does Kuznets hypotesis prevail in Bangka Belitung Province in 2001-2012 period?
2. LITERATURE STUDIES

Macroeconomy growth theory evolution begins with linear growth theories by Adam Smith, Karl Marx and Rostow (Kuncoro, 2010:7; 2004:129). According to Classic (Adam Smith, Thomas Malthus and John Stuart Mill) and neo classic (Roberto Solow and Trevor Swan) economists, economic growth is affected by four aspects: 1). Population size. 2). Capital, 3). Land area and natural resources, 4). Technology level (Kuncoro, 2004:129). In addition, the economic theorists suggest that economic growth is indicated by economic development rate increase.

Economic growth and inequality correlation was introduced by Simon Kuznets. Kuznets (1955) points out that this correlation is represented by inverted U-Shape curve. He also argues that in the beginning phase of growth, income distribution tend to decline, but it will improve in the next growth stage. This observation is known as U-Shape Curve (Kuznets, 1955:7).

![Figure 6: Inverted U Kuznets Hypothesis](source: Gallup (2012))

Todaro (2009) argues that economic growth correlates to poverty. He proposes that *Gross Domestic Product* or rapid economic growth becomes one of economic development prerequisite. However, the main issue in economic development is not only about promoting GNI growth, but also relates with the issue of the subject who causes or promotes that growth. It is important to assess whether the development growth was promoted by a big or little part of society. When the growth is caused by several rich people in a country, it can be concluded that the GNI growth brings impact only to that small group in a society. Thus, the poverty and income inequality will increase. (Todaro and Smith, 2006:48, Dawey, 1993:25).

Previously, Todaro’s argument has been discussed by classic income distribution theory and output growth in Mankiew study (2006). This theory suggests that economic growth is a function of production factor. Rapid increase of economic growth would generate improvement of income flow to household factor of production. The high rate of input productivity in goods and service creates high output growth in a country. Thus, this output growth stimulates employment rate and increases labor wage. In turn, it promotes the prosperity of society.

Williamson (1965) studies the correlation between regional disparity and economic development by examining economic data of developed and developing countries. He concludes that during early development stage, regional disparity increases and the development tends to occur only in particular area. However, in the final development stage, Williamson insists that regional disparity and economic growth decreases significantly. (Kuncoro, 2004: 133).

Many scholars have tested inverted Kuznets U Curve by examining it empirically. Several findings support the hypothesis while others reject it (see table 1).
Table 1 Empirical Studies of Kuznets Hypothesis

<table>
<thead>
<tr>
<th>Researcher</th>
<th>Location</th>
<th>Method</th>
<th>Finding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ahluwalia &amp; Chenery (1974)</td>
<td>Asia</td>
<td>Regression</td>
<td>Consistent with the Kuznets Hypothesis</td>
</tr>
<tr>
<td>Anand &amp; Kanbur (1993)</td>
<td>60 Developing and Developed Countries</td>
<td>Regression &amp; Correlation</td>
<td>Inconsistent with the Kuznets Hypothesis</td>
</tr>
<tr>
<td>Ahuja, et al. (1997)</td>
<td>East Asia</td>
<td>Regression</td>
<td>Consistent with the Kuznets Hypothesis</td>
</tr>
<tr>
<td>Bachri (2012)</td>
<td>Regency in South Sumatera</td>
<td>Regression</td>
<td>Inconsistent with the Kuznets Hypothesis</td>
</tr>
<tr>
<td>Brojonegoro (2001)</td>
<td>Indonesia</td>
<td>Econometrica</td>
<td>Inconsistent with the Kuznets Hypothesis</td>
</tr>
<tr>
<td>Bulir (2001)</td>
<td>Asia, Afrika, Amerika Latin &amp; Developing Countries</td>
<td>Correlation &amp; Regression</td>
<td>Consistent with the Kuznets Hypothesis</td>
</tr>
<tr>
<td>Caska &amp; Riadi (2008)</td>
<td>Riau Province</td>
<td>Correlation</td>
<td>Consistent with the Kuznets Hypothesis</td>
</tr>
<tr>
<td>Dipietro (2012)</td>
<td>Developed Countries</td>
<td>Regression</td>
<td>Consistent with the Kuznets Hypothesis</td>
</tr>
<tr>
<td>Eng (2009)</td>
<td>Indonesia</td>
<td>Regression</td>
<td>Consistent with the Kuznets Hypothesis</td>
</tr>
<tr>
<td>Firdausa, et al. (2012)</td>
<td>105 Regency in Indonesia</td>
<td>Regression</td>
<td>Inconsistent with the Kuznets Hypothesis</td>
</tr>
<tr>
<td>Kuncoro &amp; Sunarno</td>
<td>Banyumas Regency</td>
<td>Regression and Correlation</td>
<td>Consistent with the Kuznets Hypothesis</td>
</tr>
<tr>
<td>Lessmann (2011)</td>
<td>56 Country</td>
<td>Regression</td>
<td>Consistent with the Kuznets Hypothesis</td>
</tr>
<tr>
<td>Melikhova &amp; Cizek (2010)</td>
<td>145 Country</td>
<td>Regression</td>
<td>Consistent with the Kuznets Hypothesis</td>
</tr>
<tr>
<td>Nugrahanto &amp; Muhyiddin, (2008)</td>
<td>Indonesia</td>
<td>Regression</td>
<td>Inconsistent with the Kuznets Hypothesis</td>
</tr>
</tbody>
</table>

Ahluwalia and Chenery (1974) find positive correlation between economic growth and poverty. They point out that rapid economic development in undeveloped countries that occurs more than a decade only brings small benefit to one third of their population. It is believed that growth failure to reduce the poverty has been caused by the shortfall of trickle down effect process. This shortfall generates a worse poverty condition although the economic growth increases every year. It implies that economic growth and poverty do not have causality correlation since economic growth increase is not an absolute variable of poverty reduction process. There are many other aspects which generate inclusive economic growth that brings benefit not only to particular social group but also to all of society members.

Anand and Kanbur (1993) criticize Ahluwalia (1976) study that supports inverted Kuznets U shape hypothesis. They argue that it is to compare income distribution among the states since income variable, population and survey scope which differ in research.

Ahuja, et al. (1997) research findings in East Asia countries show that economic growth of most countries in this region has reduced the poverty rate significantly. For example, Philiphine has lower rate of poverty reduction compared to other countries in the region due to its lower GDP growth. Meanwhile, other countries such as Laos, Mongolia and Vietnam have higher poverty rate reduction in the late 1980’s.

By using simultant equation econometric model, Brodjonegoro (2001) and Dartanto and Brodjonegoro (2004) conclude that fiscal decentralization policy in Indonesia does not decline regional disparity. Yet, this policy has reduced inequality both in East and West Indonesia Territory which is indicated by high economic development rate in six regions of East Indonesia Territory. This scale is higher than national rate achievement.

Bulir (2001) point out that development rate, unemployment level and fiscal redistribution affect income inequality. Positive impact of price stability to income is nonliner. The fall in inflation from a high rate of inflation significantly lowers income inequality.

Caska and Riadi (2008) argue that inequality rate increases when the analysis uses Williamson index. In contrast, this rate tends to decline when the study employs Entrothopy Theil index approach. According to correlation test, Kuznets hypothesis occurred in Riau Province in the period 2003-3005.

Nugrahanto and Muhyiddin (2008) argue that fiscal decentralization may increase regional inequality. It shows that fiscal decentralization has not succeeded in reducing regional disparity in Indonesia in spite of its implementation since 2001.

Eng (2009) research about growth and disparity in Indonesia during 1960-1997 finds that rapid economic growth in Indonesia does not have significant impact on disparity reduction in Indonesia.
Melikhova and Cizek (2010) conduct empirical test to Kuznets hypothesis in 145 countries in the period 1979-2009. Their study illustrates that social contribution influences income inequality. In addition, they analyse historical data of income disparity during 1979 to 2009 in 145 countries. The research concludes that subsidies and social transfer policy affect income disparity significantly. Various amount of Subsidy and social transfer in many countries generates data bias. Inverted U curve exists in country with low social contribution. In contrast, country with high social contribution promotes inverted U curve it flattens and moves the maximum value to a value higher than the average income.

Lessmann (2011) examines political and fiscal decentralization impact at local level in 56 countries from 1980 to 2009. Data show that inverted U shape curve exists to support Kuznets hypothesis which indicates that regional disparity and economic development has correlation. Econometric analysis implies that political decentralization as well as fiscal decentralization have negative impact to region inequality. Interaction model shows that decentralization increases region disparity in developing countries whilst it contributes to decrease region inequality.

Dipietro (2012) conducted a study using regression analysis to investigate the relationship between per capita income and poverty in developing countries to see whether there is a correlation between Kuznets hypothesis between income inequality and per capita income in some developing countries. The results of his research indicate that there is a difference of relationship between income inequality and income per capita. Thus there is an inverse relationship between Kuznets hypothesis between poverty and income per capita.

Firdaus, et al. (2012) studies inter region development disparity dynamics in Java after decentralization policy. This study analyses data from 105 districts level period 2001-2009 and it finds that inter region income inequality remains high in district region of Java whilst inequality disparity is contributed mostly by inter cities income inequality. The disparity in Java has been generated by several main variables such as labor education, health infrastructure, electricity and water supply.

By using panel data of districts in Sumatera Selatan Province period 1993-2007, Bachri (2012) addresses local economic spatial inequality. His research suggests that the average of income distribution in this province worsen after decentralization policy implementation in Indonesia. Moreover, a local area with high natural resource has high growth but obtains big gap in income distribution.

Sutarno and Kuncoro (2003) in their research at Banyumas District conclude that Kuznets hypothesis exists in this district. The correlation between growth and Williamson Index and Entropi Theil in Banyumas District in the period 1993-2000 shows that Kuznets hypothesis prevails in this area.

3. METHODOLOGY

This research employs quantitative approach and examines secondary data from journal, report, books and other scientific work which are relevant with this study in the period 2001-2012. Furthermore, our research also uses official data from Badan Pusat Statistik (National Statistic Bureau) and Bappenas (National Development Planning Agency). Data analysis uses economic growth data, gini ratio in 2001-2012 to test inverted U shape curve Kuznets hypothesis in Bangka Belitung Island Province.

Income disparity is measured by gini coefficient and Gross Regional Domestic Product per capita which indicates economic development. This study modifies Melikhova and Cizek (2012) model and conducts linear regression between gini index and logarithm of Gross Regional Domestic Product per capita. The correlation between gini index and logarithm of Gross Regional Domestic Product per capita is described by the following model:

\[
\text{GINI}_i = \beta_2 \log(\text{PDRB})_i^2 + \beta_1 \log(\text{PDRB})_i + \beta_0 + \epsilon_i, \quad (1)
\]

\[
\text{GINI}_i = \beta_2 \log(\text{PDRB})_i^2 + \beta_1 \log(\text{PDRB})_i + \beta_0 + \epsilon_i, \quad (1)
\]

GINI is income inequality in Bangka Belitung Province in year i. GDRP is economic growth of Bangka Belitung Province in year i. Positive coefficient in and negative coefficient in, which are generated from regression, shows Kuznets hypothesis. Maximum value of U curve, which is described by formula (1) (Melikhova and Cizek, 2012:3), is generated from the following formula:

\[
\text{PDRB}_{\text{TP}} = 10 \left( \frac{\beta_0}{2\beta_2} \right)^{1/2}, \quad (2)
\]

According to Kuznets Hypothesis, “turning point” refers to point that indicates higher economic development but lower index rate. This condition is described in graphic with inverted-U. The correlation is in line with inverted-U Kuznets hypothesis. Gini ratio maximum value is created from the following formula (Melikhova and Cizek, 2012:3):

\[
\text{GINI}_{\text{max}} = -\frac{\beta_1^2}{4\beta_2} + \beta_0, \quad (3)
\]
In addition, the study adopts regression analysis method and employs SPSS software to analyse data.

4. FINDINGS

Table 2 and 6 show that gini index of Bangka Belitung Province indicates inequality increase trend in period 2001-2001. However, this trend does not automatically proves Kuznets hypothesis in Bangka Belitung Island Province.

<table>
<thead>
<tr>
<th>Year</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>CV</td>
<td>0.37</td>
<td>0.35</td>
<td>0.32</td>
<td>0.30</td>
<td>0.35</td>
<td>0.35</td>
<td>0.34</td>
<td>0.33</td>
</tr>
<tr>
<td>Gini</td>
<td>0.24</td>
<td>0.28</td>
<td>0.26</td>
<td>0.26</td>
<td>0.26</td>
<td>0.28</td>
<td>0.27</td>
<td>0.30</td>
</tr>
</tbody>
</table>


During 2004-2011, The main GDRP district contributors in Bangka Belitung Island Province consists of Bangka Barat Districts, Bangka Districts, Bangka Tengah Districts, and Pangkalpinang City. Bangka Barat Districts in 2012 contributed by 23.92%, Bangka District and Bangka Selatan District share by 18.11% and 12.95% respectively. The lowest contributors are Belitung Timur District, Belitung District and Bangka Tengah District, 99%, 11.16% and 12.37% (see figure 5).

Figure 5: Percentage of Contribution of Regency to GDRP Bangka Belitung Island Province Period 2004-2011


Most of economic development studies use variation coefficient uses inter region inequality as their indicator (Kuncoro, 2003:287). Inter region Coefficient Variation and GDRP in Bangka Belitung Province in 2005 is 0.37 and 0.33 in 2011. These conditions indicate that inequality rate in Bangka Belitung Province decrease during 2004 to 2011 (see table 2).

Figure 6: Coefision Variation and Gini Index of Bangka Belitung Island Province Period 2004-2011

Figure 6 describes that gini index in Bangka Belitung Island Province in the period 2001-2012 is on average around 0.26. This rate is lower than national record which is 0.35 in the same period. This condition shows that Bangka Belitung Province GDRP is distributed more equally than national average number.

The correlation between Economic growth and gini index and variation coefficient are derived from pearson correlation. The following table describes the pearson correlation result.

<table>
<thead>
<tr>
<th>Table 3: Correlation Pearson Between Economic Growth with Gini Index in Bangka Belitung Island Province Period 2001-2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corelation</td>
</tr>
<tr>
<td>CV</td>
</tr>
<tr>
<td>Index Gini</td>
</tr>
</tbody>
</table>

Note: * α = 5%
Source: Processed from the Table 2

Pearson correlation analysis between economic growth and gini index generates 0.664 correlation coefficient and significance to α 5 percent. This implies that economic growth and gini index correlates positively. It means that economic growth increase will be coincided with an increase in income distribution inequality.

Pearson correlation result between economic growth and variation coefficient creates -0.423 coefficient correlation. It indicates that economic growth and variation coefficient do not correlate significantly. Furthermore, it also shows that economic growth creates inter region inequality. Yet, this result is not statistically significant.

Kuznets Hypothesis Proof
Kuznets Hypothesis, which is known as inverted U curve, describes that at early stage of development process the income inequality occurs. However, in the next stage, the income is distributed more equally and coincide with income per capita increase. Gini index of Bangka Belitung Island Province shows that this province has increasing inequality trend. Kuznets Hypothesis proof uses gini index as dependent variable and income per capita as independent variable. Inverted U curve is proved by inserting those variables to regression analysis and the following table describes this analysis result.

<table>
<thead>
<tr>
<th>Table 5: Effect of Gini Index to Growth of Income Percapita in Bangka Belitung Island Province Period 2001-2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Independent Variable</td>
</tr>
<tr>
<td>Constant</td>
</tr>
<tr>
<td>GDRP</td>
</tr>
<tr>
<td>GDRP^2</td>
</tr>
<tr>
<td>Adj R^2</td>
</tr>
</tbody>
</table>

Source: Processed from the Central Bureau of Statistics (2001-2012)

Note: * significance to α = 5%
** significance to α = 1%

The table shows that the variable level of per capita income is not significant quadratically at α = 5 percent (see table 5 model 1). However it is significant linearly at α = 1 percent (see table 5 model 2). This means that the growth of per capita income has a linearly effect on gini index (see figure 6):
Figure 6: Curva of Kuznets Hypothesis in Bangka Belitung Island Province Period 2001-2012

Source: Processed from the Central Bureau of Statistics (2001-2012)

Figure 7: Curva Quadratic of Kuznets Hypothesis in Bangka Belitung Island Province Period 2001-2012

Source: Processed from the Central Bureau of Statistics (2001-2012)

Figure 8: Curva Cubic of Kuznets Hypothesis in Bangka Belitung Island Province Period 2001-2012
Figure 6, 7 and 8 show that quadratic and cubic do not generate inverted U curve linearly as proposed by Kuznets hypothesis. Thus, it can be concluded that the inverted U curve does not occur in Bangka Belitung Island Province during research observation period. It implies that income distribution increase equally in early stage of development process in Bangka Belitung Province. Yet, in the next development stage, this income distribution tend to be unequal and occurs parallel with per capita income increase.

The following table describes findings from previous studies which become reference in this research:

<table>
<thead>
<tr>
<th>Period</th>
<th>Country</th>
<th>Sample</th>
<th>Validity of Data (%)</th>
<th>GINI$_{max}$ (%)</th>
<th>GDP$_{TP}$ (constant 2000 US$)</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1965-1971</td>
<td>60</td>
<td>60</td>
<td>0.6</td>
<td>57.6</td>
<td>642</td>
<td>Ahluwalia (1976)</td>
</tr>
<tr>
<td>1970-1990</td>
<td>75</td>
<td>75</td>
<td>0.8</td>
<td>62.7</td>
<td>2221</td>
<td>Bulir (2001)</td>
</tr>
<tr>
<td>1990-2000</td>
<td>44</td>
<td>45</td>
<td>0.5</td>
<td>45.0</td>
<td>2575</td>
<td>Hayami (2005)</td>
</tr>
<tr>
<td>1965-2003</td>
<td>82</td>
<td>82</td>
<td>0.8</td>
<td>46.0</td>
<td>2570</td>
<td>Iradian (2005)</td>
</tr>
<tr>
<td>1970-1990</td>
<td>75</td>
<td>75</td>
<td>0.8</td>
<td>45.9</td>
<td>912</td>
<td>Lin et al. (2006)</td>
</tr>
<tr>
<td>1979-2008</td>
<td>145</td>
<td>630</td>
<td>6.3</td>
<td>43.8</td>
<td>1528</td>
<td>Melikhova &amp; Cizek</td>
</tr>
<tr>
<td>2001-2012</td>
<td>7 Regency</td>
<td>7 Regency</td>
<td>0.07</td>
<td>0.30</td>
<td>-</td>
<td>Ariadhy &amp; Arkum</td>
</tr>
</tbody>
</table>

5. CONCLUSION
The study of “Economic Growth and Income Inequality in Bangka Belitung Island Province in the period 2001-2012” can be concluded as follows:
1. During research observation period (2001-2012), income inequality tends to occur and it is concluded by gini index analysis. Yet, variation coefficient analysis indicates that inter region inequality does not exist in Bangka Belitung Island Province.
2. Kuznets Hypothesis which describes inequality in inverted U curve does not occur in Bangka Belitung Island Province in the period 2001-2012. It is represented by positive linear curve which its line moves from left bottom to top right. This condition implies that GDRP per capita increase generates income inequality increase in Bangka Belitung Island Province.

6. RECOMMENDATION
This study proposes several recommendation as follows:
1. Productivity and income increase through main sector such as agriculture and tourism which become important after tin mining. It can create employment and provide local government revenue as well as foreign exchange. In turn, it will create prosperity.
2. Government policy and program should prioritize to increase and create equal economic growth thus it would stimulate actor who has access capacity to economic resource.
3. The Districts in Bangka Belitung Island Province should manage the natural resources, thus it would generate economic growth through local infrastructure development and investment.
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