

Premature Structural Transformation and Income Inequality in Pre and Post Commodity Boom Period in Indonesia

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ABSTRACT

Since 2000, Indonesia had been confronted with the problem of increasing income inequality between the poor and rich. At the same time, there was a shift change in the economic structure. That was the decrease in the contribution of manufacturing sector which was replaced by services sector and the increase in raw material export due to the jump in commodity prices. This study aims to measure the determinants of inequality from the employment side in the form of structural transformation and the economic openness side in the form of trade and investment. By using a dynamic panel model, it is known that the increase on trade openness has a significant effect on the reducing of income inequality, but its effect has diminished in the commodity boom period. Meanwhile, the structural transformation from the agricultural sector to the services sector has contributed a significant role in reducing inequality.

Keywords : dynamic panel, commodity boom, income inequality, trade, premature structural transformation

I. INTRODUCTION

Income inequality in Indonesia tends to increase after the end of the 1997-1998 economic crisis. Compared to the previous decade, the increase of income inequality was faster compared to other southeast Asian countries. In 1990, a fifth of Indonesia's richest households consumed 38.9 percent of total national income. This distribution worsened in 2014 where the top 20 percent richest people consumed almost half of the total national income (47.4 percent). The opposite was occur in the bottom of 20 percent poorest people where its percentage compared to the national consumption continued to decline from 9.4 percent in 1990 to 7.2 percent in 2014.

The 1997-1998 economic crisis caused the Indonesia's economy falling down due to the sharp depreciation of the rupiahs. The manufacturing sector was also

quite affected because of the difficulties in getting imported inputs. The global economy began to improve in the 2000s in line with the rapid growth of two Asian countries, namely China and India. Because of the rapid economic growth of several countries the demand for raw materials became high, which led to a surge in commodity prices in the international market (commodity boom).

Indonesia enjoyed the commodity boom in 2001-2012. During this period, Indonesia's export structure was dominated by the exports of natural resources such as petroleum, coal, natural gas, rubber and palm oil. By utilizing these exports, Indonesia was able to get out from the crisis and create high economic growth, on average by 5.24 percent. But a new problem arised because the most of the national income derived from commodities trading was not evenly distributed.

According to Wihardja (2016), one of the causes of the rising on income inequality in Indonesia after 2000 was the early de-industrialization in Indonesia due to the mini Dutch Disease caused by the commodity boom. The appreciation of the rupiahs exchange rate due to the increase on the exports commodity had caused sectors other than natural material to be less competitive in international markets, including the manufacturing sector. Finally, the share of the manufacturing sector was decline and economic transformation actually occurred from the agriculture sector to the informal services sector.

The policy of inequality reduction was closely related to the effort to increase in the poorest people income. The population of the lower economic class who mostly work in the agriculture sector tended to have a small income because the agriculture sector had low productivity. The manufacturing and services sectors often become the destination of the sectoral migration in agricultural sector workers to improve economic conditions.

Although the sectoral migration will be able to increase the agricultural workers income, the doubts about the effectiveness of the two structural transformations in reducing income inequality arise. This phenomenon arised due to the fact that manufacturing sector which is a destination sector experiencing a decline in productivity since the 1997-1998. This decline in productivity was reflected by the decline in the share of value added but the employment in manufacturing sector had not declined. Meanwhile, the type of service sector that was able to accommodate the migration of agriculture workers was usually in the form of low-income and informally.

Several studies had tried to prove the effect of structural transformation on income inequality in Indonesia such as Dartanto (2017), where the structural transformation variable was approximated by share output on GDP. This study aims to measure

the determinants of inequality from the external (global) and domestic sides together in order to be able to provide a comprehensive explanation of the characteristics of income inequality. In addition, the use of labor flow in measuring structural transformation would reduce the bias of the share output approach that does not accommodate changes in productivity.

Kuncoro and Murbarani (2016) prove a positive relationship between economic openness and income inequality. Meanwhile, Dartanto (2017) that adopting the Dastidar (2012) model found that the transformation of agriculture-manufacturing and agriculture-services caused the income inequality to increase. Beaton et al. (2017) measured the impact of economic openness on income inequality in Latin American and Caribbean countries. This study concludes that trade openness can reduce inequality in developing countries in Latin America and the Caribbean.

Barro (2000) explained that Kuznets theory built the basic idea of a change in economic structure from agriculture to manufacturing. Workers who migrate from agriculture to manufacturing sector will get an increase in per capita income which will ultimately increase inequality. In the next stage sectoral migration was also experienced by the low educated agriculture worker so overall income inequality will slowly decline.

Based on the background and formulation of the problems outlined above, the objectives of this study are to analyze the effect of premature structural transformation and economic openness on income inequality in Indonesia during the pre and post commodity booming.

II. METHODS AND MATERIAL

Previous literature revealed that structural transformation was a domestic factor that plays an

important role in determining the distribution of income. Changes in economic structure can occur between the agriculture sector to the manufacturing sector or from the agriculture sector directly to the services sector. Meanwhile, foreign factors are usually dominated by international trade and capital flows.

This study used secondary data which was mostly obtained from BPS-Statistics Indonesia, except the incoming FDI data that obtained from the Investment Coordinating Board (BKPM). Panel data collected from 33 provinces during the 2007-2016 period.

Inequality often showed persistence behavior as research conducted by Meschi and Vivarelli (2009) and Niehues (2010). In addition, there is often a quadratic relationship between inequality and per capita income as explained by the U-inverse Kuznets hypothesis.

$$gini_{it} = \beta_0 + \beta_1 gini_{it-1} + \beta_2 to_{it} + \beta_3 lnfdi_{it} + \beta_4 lngpc_{it} + \beta_5 (lngpc_{it})^2 + \beta_6 tr_{ind_{it}} + \beta_7 tr_{jasa_{it}} + \beta_8 dummy + \beta_9 dummy \times to + \beta_{10} CV_{it} + \varepsilon_{it}$$

gini is income inequality, *gini_{it-1}* is one year lag of inequality, *to* is trade openness, *fdi* is foreign direct investment, *gpc* is income per capita, *exppc* is expenditure per capita, *tr_ind* is a structural transformation from the agricultural sector to the industrial sector and *tr_jasa* is structural transformation from the agricultural sector to the service sector. The model also includes dummy time, namely commodity boom period and dummy interaction with trade openness. The dummy was filled with a value of 1 in 2010-2012 and another period was filled with a value of 0. Each model used a control variable (CV), namely inflation, business credit, senior high school enrollment rates and paddy field area.

The structural transformation from the agriculture to manufacturing is measured as a decrease in the ratio

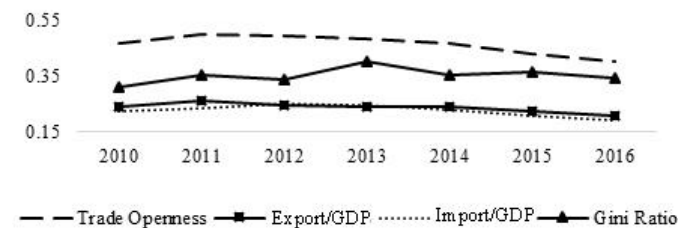
of the agriculture employment share compared to the manufacturing sector. Meanwhile, the structural transformation from the agriculture to the services sector is measured as the ratio of agriculture employment share compared to the service sector.

Lag inequality variables that are included as independent variables causes endogeneity problems, so if the model is estimated with a fixed effect or random effects approach it will produce biased and inconsistent predictors. To overcome this problem, Arellano and Bond (1991) proposed the Generalized method of moments (GMM) approach. There are two estimation procedures commonly used in the GMM framework, namely first-differences GMM (FD-GMM) and System GMM (SYS-GMM).

III.RESULTS AND DISCUSSION

Trade and Inequality

During 2010-2016, the general decline in trade openness in Indonesia tended to worsen income inequality. This could be seen from the results of the dynamic panel model where the coefficient of trade openness was negative. Global financial conditions that had not fully recovered since 2008 had reduced the demand for various Indonesian export products.



Source: BPS-Statistics Indonesia

Figure 1: Trade Openness and Gini Ratio, 2010-2016

Meanwhile, a significant dummy interaction coefficient indicates that there was a difference in the effect of trade openness on income inequality between commodity boom and outside the commodity boom period. The effect of trade openness in reducing income inequality became smaller during

commodity booms. During the outside the commodity boom period, every 1 point increase in trade openness will reduce inequality by 0.014, while in booming periods it will only reduce inequality by 0.0064.

TABLE I. RESULTS OF INEQUALITY DETERMINANT MODELING

Independent Variable	Coefficient (p-value)
Lag gini (-1)	0.4642*** (0,000)
Trade openness	-0.014*** (0.003)
Ln(FDI)	0.0024*** (0,000)
Transformation agriculture-manufacturing	-0.0014 (0.225)
Transformation agriculture-services	0.0228*** (0.000)
Ln(income per capita)	0.0841*** (0,000)
(Ln income per capita) ²	-0.0115** (0,041)
Dummy booming commodity period	0.0049** (0,011)
Dummy booming commodity x to	0.0076* (0,075)
Inflation	0.0003*** (0.004)
Business credit	-0.0007** (0.029)
Senior high school enrollment rates	-0.0009*** (0.000)
Paddy field area	-0.0010 (0.655)
Sargan test (<i>p-value</i>)	0.928
A-B test (<i>p-value</i>)	
AR(1)	0.000
AR(2)	0.497

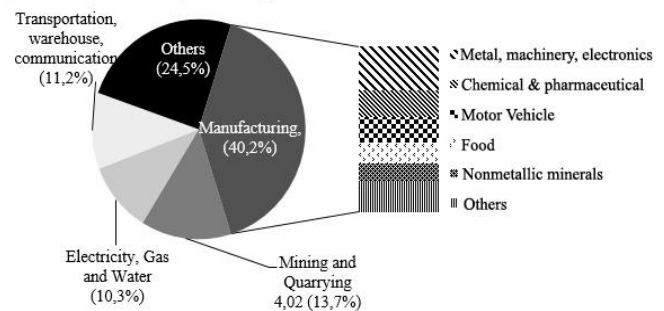
Note : p-value in parentheses. statistical significance: ***. 99%, **: 95%, *: 90%

The composition of export was generally dominated by non-oil and gas fuel which were mostly produced from the manufacturing sector. In 2016, manufacturing sector dominated export by 66.2%,

followed by the oil and gas sector by 15.0%. The highest exports value in the manufacturing sector was found in processed agricultural products, especially palm oil.

In 2016, the manufacturing sector absorbed 13.9 million workers (12.2%). Labor intensive industries were found in the textile and food industries which dominated employment in the manufacturing sector. However, the food industry only had a low share of exports. The high export share was found in the textile industry which contribute USD 14.4 billion (9%).

Another component of trade openness was the import of goods and services. When viewed from its composition, imports were dominated by raw materials. The percentage value of imported raw materials, capital goods and consumer goods in 2016 amounted to 21.35%, 15.56% and 14.16%, respectively. Imports will have a good impact in reducing inequality if imported raw materials are able to encourage the domestic industries so that the workforce will be absorbed.



Source: BPS-Statistics Indonesia

Figure 2: FDI by economic sector and manufacturing in 2016

According to the economic sector, the top three sectors that became the target of foreign investors in 2016 were the manufacturing sector; mining and quarrying sector; and the transportation, warehouse and communication sectors. Since 2011, FDI has been dominated by the manufacturing sector. The regression results were in line with the fact that the

manufacturing sector targeted by investors was still capital intensive and thus unable to reduce income inequality. Those capital intensive industry were the metal and machinery industry; chemical and pharmaceutical industries; and the motor vehicle and other transportation industries.

Structural Transformation and Inequality

The contribution of manufacturing sector showed a declining trend since 2000, but the employment had increased even with a small percentage. This trend shows that the productivity of the manufacturing sector tends to decline. In addition, workers who want to enter the manufacturing sector also need high specifications and skills, so this often became a barrier of the migration in the agriculture workers to the manufacturing sector.



Source: BPS-Statistics Indonesia

Figure 3: Share of value added and employment in manufacturing sector

The wage gap between high educated and low educated worker was quiet wide in the manufacturing sector. The wage of university graduates was twice the wage for high school/vocational high school graduates. Minimum wage policies could also have an impact of slowing down formal employment growth in the manufacturing sector. The impact of this wage increase was only experienced by a small proportion of workers (Suryahadi et al., 2003).

The structural transformation from the agriculture sector to the services sector had significantly impact in reducing income inequality. The trade sector became the main choice for farmers to change his

employment to improve welfare. In 2016, a total of 527 thousand workers leave out from the agriculturae sector where 24.4% entered the trade sector and 19.76% entered the manufacturing sector. In terms of employment status, 43.86% of the business sectors in the service sector were informal sector.

IV.CONCLUSION

The decline in economic openness that occurs in Indonesia had a significant effect on increasing income inequality. Increased economic openness in the commodity boom period had an impact on reducing inequality, but the impact was lower than outside the boom period. Meanwhile, the structural transformation from the agriculture sector to the manufacturing sector did not significantly affect inequality. It was precisely the transformation to the service sector which reduces inequality. The service sector was a flexible sector that receives an abundance of workers from the agricultural sector. Low skill workers who had difficulty finding work in the formal service sector can switch to the informal service sector such as trade and public, socio-culture, entertainment and other personal services. The level of wages in the services sector was relatively uniform compared to the manufacturing sector.

The services sector can be an alternative employment during the decline in productivity of the manufacturing sector. Strengthening the service sector needs to be done by the government, such as create the regulations that protect the informal sector and expand the business credit facilities. Meanwhile, the recovery of the manufacturing sector needs to be done through the policy of providing facilities for foreign investors who want to invest in labor-intensive industries.

V. REFERENCES

[1] [BPS] Badan Pusat Statistik. 2018. Available at <https://www.bps.go.id/publication.html?>

- Publikasi%5BtahunJudul%5D=&Publikasi%5Bkunci%5D=statistik+indonesia&yt0=Tampilkan
- [2] Arellano M dan Bond S. 1991. Some Test of Specification for Panel Data: Monte Carlo Evidence and Application to Employment Equations. *The Review of Economics Studies*. 58: 277-297
- [3] Barro. 2000. Inequality and Growth in a Panel of Countries. *Journal of Economic Growth* [Internet] . [diunduh 2008 Jun 18]; 5:5-32. Available at :<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.477.3136&rep=rep1&type=pdf>
- [4] Beaton K et al. (2017). Revisiting the Link between Trade, Growth and Inequality: Lessons for Latin America and the Caribbean. IMF Working Paper WP/17/46
- [5] Dartanto et al. 2017. Two Decades of Structural Transformation and Dynamic of Income Equality in Indonesia. Asian Development Bank Institute Working Paper Series No. 783
- [6] Dastidar AG. 2012. Income Distribution and Structural Transformation: Empirical Evidence from Developed and Developing Countries. *Seoul Journal of Economics* ; 25(1):25-56. Available at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2020903
- [7] Etchemendy S. 2009. Models of Economic Liberalization: Regime, Power and Compensation in the Iberian-American Region. APSA 2009 Toronto Meeting Paper
- [8] Joshi RM. 2009. *International Business*. Oxford (GB). Oxford University Press
- [9] Kuncoro M and Murbarani N. (2016). Regional Inequality in Indonesia, 1994-2012. *The Business and Management Review*. 8(1): 38-52
- [10] Meschi E, Vivarelli M. 2009. Trade and Income Inequality in Developing Countries. *World Development Elsevier*. 37(2): 287-302
- [11] Niehues. 2010. Social Spending Generosity and Income Inequality: A Dynamic Panel Approach Available at: <http://ftp.iza.org/dp5178.pdf>
- [12] O'Sullivan A., Steven M. S.. 2003. *Economics: Principles in action*. New Jersey (US): Upper Saddle River
- [13] Suryahadi A et al. 2003. Minimum Wage Policy and Its Impact on Employment in the Urban Formal Sector. *Bulletin of Indonesian Economics Studies* 39(1), 29-50
- [14] Wihardja M M. 2016. The Effect of the Commodity Boom on Indonesia's Macroeconomic Fundamentals and Industrial Development. *International Organisations Research Journal*. 11(1):39-54

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