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International Trade and North-Sumatra's Local Economy

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Abstract

North Sumatra is one of the provinces in Indonesia with high levels of economic openness. On average, since 2000, the contribution of export value to the Regional GDP reached 40 % and import value of 28%. Using Granger causality method, the study aims to investigate causal relations between international trade and North Sumatra's local economy especially the impact of exports and imports on Regional GDP, Regional GDP per capita, employment and poverty reduction. The empirical results of present study discovered that (i) the exports and imports respectively have positive and significant impact on regional GDP, regional GDP per capita, employment and poverty reduction, (ii) there is a bi-directional causality between imports and regional GDP, where GDP growth rate would boost imports over-proportionally, (iii) both exports and imports are dominated by intermediate goods as the raw materials for further processing industry, (iv) export structure which is dominated by the agricultural-based intermediate good is poverty-reduction through factor market in the upstream sector making the rural peoples benefited from the exports.

Keywords: North Sumatra, Granger causality and cointegration, trade and regional economic development, trade and employment, trade and poverty alleviation

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INTRODUCTION

International trade will provide benefits to the countries involved therein. According to Adam Smith, trading itself takes place on the basis of absolute advantage, which in the text book of international economics among others by Salvatore (2013) and Krugman et al. (2012) describes the model of two countries and two commodities where the efficiency of labor (as the only factor of production) differs in the production of commodities in both countries. The next thought development is focused on the reasons why trade takes place, where David Ricardo showed that the absolute advantage is just a special case of a comparative advantage and the advantage is viewed from the perspective of opportunity cost of the commodities produced. With this concept, a trade still takes place although one of the countries experience absolute disadvantages on both commodities, as long as the opportunity cost to produce them in both countries is different. Furthermore, Heckscher and Ohlin stated that comparative advantage measured at a lower opportunity cost originated from different factors endowments in respective countries so that each country has a unique production factor proportion. Meanwhile, a preliminary thesis on welfare improvement as a result of international trade remains unchanged. Both countries will benefit from the welfare improvement illustrated with the ability to consume a combination of two commodities outside a production possibility curve (frontier curve), which means to reach furthest out the social indifference curve. The availability of goods merely increased as a result of an exchange, meanwhile, the quantity of production factors remains unchanged. The concept of endogenous growth theory proposed by Romer (1990) and Grossman & Helpman (1990) added more international trade benefits especially for developing countries, where with the integration of economy, growth can be accelerated through a variety of channels including increased innovation, technological spillovers and elimination of replication in research and development (R&D).

Empirical studies on the relationship between exports and economic growth is so far become an object of abundant papers, for example, Giles & Williams (2000) made 150 empirical literatures as the object of their studies. Early on, the objective of the study is to discover the relationship between export growth and economic growth (GDP or GDP per capita) in time-series and cross section data with country groupings variation examined based on economic progress measured in per capita income or the proportion of exports in GDP.

A very high correlation between export growth and economic growth found in numerous study has postulated that exports is driving force of growth, which is also popularly coined as export as engine of growth. More specifically, Yang (2008) showed that at the time of high economic growth, from 81 countries observed, 70 of them experienced higher export growth than GDP growth. Next, the study on exports and economic growth focused much on export-led growth hypothesis, be it at cross-countries levels, and at regional levels such as Latin America and Caribean (Kristjanpoller et al, 2016) or at an individual country level such as Bosupeng (2015) for Botswana.

That a country needs a certain minimum level of development as a prerequisite to obtain a strong correlation between

economic growth and exports has been discussed by Michaely (1977). In other words, the structural transformation of a country will affect the magnitude of export contribution on economic growth through a combination of export commodities. Vollrath & Johnston (1991) introduced the hypothesis of dynamic comparative advantages by disaggregating export commodity groups into 10 categories based on the level of industrialization/ technology producing commodities, then by grouping countries into five categories based on their per capita income. The test result indicates that the level of economic development in a country is in conformity with the composition of the export commodities, where low and upper low income countries will export commodities of agriculture, fish and forestry as well as mining while the upper middle and high income countries will export basic intermediates, finished capital and high technology goods. In line with that, Hesse (2008) put forth that export diversification and per capita income growth have been closely associated over some stage of their development path. This is examined by Agosin et al., who compared the economic development of Asian countries with Latin America and Caribbean, in that both GDP and exports consistently grew faster in the Asian countries than in Latin America and the Caribbean. In fact, the ratio of GDP growth to export growth is practically identical in the two regions for the two periods analyzed but Asian countries' exports not only grew faster but were also of higher "quality"; that is, they were considerably more diversified (Agosin et al. 2012).

Export diversification means multiplying the commodities with high added value which replaces low quality commodities. Hence, exports do not automatically increase

growth."It matters more what you export and how diversified your exports are than how much you trade" (Vos, 2007: 14). There is a non liniear pattern in trade to growth relationship, which Huchet-Bourdon et al. (2018:61) formulated as, "that countries more open to trade and exporting higher quality products experience higher growth … the higher the quality of the export basket of the country, the greater the positive impact of trade on economic growth". Quality is sourced from technology and innovation. Both technology and innovation play an important role in the development, technology that in turn affect trade pattern as found in new industrial countries in East Asia such as China, South Korea and Japan (Guo & N'Diaye 2009; Zang & Baimbridge 2012).

Within international trade literatures, unemployment has not been separately discussed, rather as a dynamic part of the exchange process for trade. By referring to the Hecksher-Ohlin model, the impact of trade on unemployment is conditional. Salvatore (2013) and Krugman & Obsfeld (2012), as in the textbook mentioned above, describes the Samuelson-Stolper theorem as follows: If one country is relatively abundant with capital factors compared to the rest of the world, then the country will have comparative advantages in a capital-intensive commodity trade. The trade will increase world demand for commodities so that the country, which produces the commodities would boost production. Increased production means increased demand for production factor (in this case capital and labor) so that the level of unemployment and real wages will increase. On the contrary, this country will import labor intensive commodity, which will lower domestic commodity prices thus labor intensive commodity industries will reduce

production with the extended effects of demand for production factor (capital and labors) will drop leading to rising unemployment rate and low wage rate.

Furthermore, countries whose exports composition is dominated by raw materials with increased export rate will somehow increase unemployment rate as generally experienced by most countries in Africa (Drabo 2013). Meanwhile, countries that import more raw materials will experience a rising employment rate as compared to countries whose imports composition is dominated by final products.

In general, protectionism will increase unemployment rate, while openness will reduce unemployment rate (Dutt et al. 2009 and Felbermayr et al. 2011). Dritsakis & Stamatiu (2017) stated that the exports have an effect on unemployment through economic growth. Exports as well as FDI have a positive effect on economic growth and afterwards economic growth has a negative effect on unemployment. While Felbermayr et al. (2011) argues that economic openness affect unemployment through the role of total factor productivity. More openness forces unproductive firms to quit allows more productive ones to expand. The average firm's productivity increases, its revenue per match relative to the cost of vacancy creation goes up, and so do its incentives to create jobs. More detail channels on the linkage between trade and growth/productivity growth could be seen at Busse & Königer (2012).

Stolper-Samuelson theorem further elaborates that exports will increase commodity price which labor-intensive in production and further increase real wages, then exports will alleviate poverty through factor markets and wages rate. Meanwhile,

trade promotes growth and with the increased income as a result of fast economic growth, the government may provide financing for poverty alleviation programs (the recent empirical finding from Central Java, Indonesia, delivered by Sriyana 2018). Thus, the growth reduces poverty. Bhagwaty/ Srinivasan (2002) mentions that growth is a principal driver of reduced poverty, as found in China and India. Poverty in China dropped from 28 % in 1978 to 9 % in 1998, while poverty in India dropped from 51 % in 1977/78 to 27 % in 1999/2000. Furthermore, Berg & Krueger (2003) put forth that trade liberalization increases growth in average per capita income through out productivity growth, on the other hand there is no evidence that liberalization will worsen or improve inequality, thus the income of the poor tends to grow proportionally with per capita growth.

The relationship between trade liberalization and poverty through factor markets is not automatic but conditional. Trade liberalization increases efficiency through increased productivity. Whether increased productivity resulted in a reduced input use or increased output, both will affect exactly the opposite poverty reduction. If higher productivity reflected declining inputs rather than increasing output, the effect could be to reduce employment and hence exacerbate poverty (Winters et al. 2004). In this case it applies that the trade increases growth and more poverty reduction, depending on what is exported and how diversified the exports are rather than how much the trade (Vos 2007). That is the reason trade liberalization produces a different impact on poverty in developing countries. Multi-lateral trade liberalization will reduce overall poverty in Indonesia, Philippines, Uganda, and Zambia,

but increase overall poverty in Brazil, Chile, and Thailand (Hertel & Reimer 2005).

Winters (2002) has proved that the complexity of the links between trade and poverty, as poverty is analyzed at the household level where each household-member is associated with the market (directly affected by price changes for trade), indirectly affected by decision adjustment made by the firm on wages and employment and directly affected by government spending sourced from economic growth. The links between trade and poverty are conceptually complex and empirically, the calculation of poverty and imbalances also experienced the complexity that emanates from dubious data and technical calculations that cause bias as indicated by Wade (2004).

In general, the impact of trade reform on poverty are positive because trade protection favoured skilled labor and capital relative to unskilled workers, so that its removal lifts unskilled workers, the primary source of income for many of the world's poor (Anderson et al. 2005). This positive impact will grow if accompanied by supporting policies such as infrastructure development that facilitates transportation, so that price transmission can reach the rural population that are far from the price border (Hertel & Winters 2005). In terms of trade policy, as for developing countries, the elimination of import tariffs by the developed countries has more positive impact on poverty in developing countries as compared to the demands for full reduction of domestic support in the developed countries (Ivanovic, 2005).

It is imperative to understand the causal relationship between international trade and economic growth and wider regional development in order to be able to provide recommendations on exports policies or other alternatives that aim to make the most of the benefits of economic integration. Furthermore, export promotion as an instrument of regional development can be implemented proportionally.

So far, studies on international trade and development have been conducted at a country level (individually) or countries group (cross-countries or regional). For Indonesia in particular, where its total land area is vast with various socioeconomic conditions, availability of resources and openness to the very diverse global market, an analysis at a country level can be misleading. Therefore, as part of the process of decentralization since 2001, a study at a local level is highly needed. In line with that, the objective of this study is to investigate the causal relationship between international trade and North Sumatran regional economy in Indonesia. In details, we also investigate the impacts of exports or imports on (i) gross regional domestic product, (ii) per capita income, (iii) employment opportunities and (iv) poverty reduction.

RESEARCH METHODS

In the last 17 years, the average export value of North Sumatra reached 40 % of Regional Gross Domestic Product (GDP) and the import value reached the average of 28 % (all in real term with 2000 as basis year). On the other hand, both exports and imports have been dominated by industrialized intermediate goods which will become the raw materials for further processing. The composition of capital-goods imports are at the average of 20%. With the magnitude of exports and imports value along with the composition of the types of goods, it is expected that the value of exports and

imports will have a positive impact on Regional GDP and Regional GDP per capita. Using Indonesian currency (IDR) for export value, the import values and Regional GDP in real (2000 = 100) causal relationship value between exports and economic growth and between imports and economic growth will be analyzed using granger causality method.

Granger causality method was first introduced by Granger (1969) and was developed by Engle & Granger (1987) for no causal relationship cases. This method is a standardized approach in testing the export-led growth hypothesis (the latest by Abosedra & Tong 2018 to MENA countries with data from 1980 - 2002 and by Topcu & Payne, 2018 who investigates the impact of trade on energy consumption in OECD countries using data from 1990 – 2015, and for Indonesia's context can be seen in Subiyakto & Algifari 2016).

Granger causality approach is used to observe the causal relationship between the two variables, in terms of (i) interplay (bi-directional), (ii) unidirectional, or (iii) no relationship at all. The model was formulated by referring to Asteriou/Hall (2016) as follows:

$$y_t = a_1 + \sum_{j=1}^{n} \beta_i x_{t-1} + \sum_{j=1}^{m} y_j y_{t-j} + e_{1t} \tag{1}$$

$$x_t = a_2 \sum_{i=1}^{n} \theta_i x_{t-i} + \sum_{j=1}^{m} \delta_j y_{t-j} + e_{2t} \tag{2}$$

The results of two linear regression equations above will yield four possible interpretations of the value of the coefficient generated:

(i) x_t affects y_t, if $\sum_{i=1}^{n} \beta i \neq 0$ on the equation (1) and $\sum_{j=1}^{m} \delta j = 0$ on the equation (2)

(ii) y_t affects x_t, if $\sum_{j=1}^{m} \delta j \neq 0$ and $\sum_{i=1}^{n} \beta i = 0$.

(iii) There is a bi-directional causality, if $\sum_{i=1}^{n} \beta i$ dan $\sum_{j=1}^{m} \delta j \neq 0$.

(iv) y_t is independent of x_t, if $\sum_{i=1}^{n} \beta i$ and $\sum_{j=1}^{m} \delta j = 0$.

Granger causality shows a short-term relationship, so that even though there is no relationship between the two variables in the short term, there is still the possibility of a long-term relationship. The relationship between the variables under Granger non-causality can be further tested using cointegration test with the following four steps:

Step 1: to test each variable to determine its order of integration. The augmented Dickey-Fuller (ADF) will be applied in order to infer the number of unit roots (if any) in each of the variable. Three possible results that will be obtained, (i) both variables are stationery (I(0)), in this case classical regression analysis can be applied, (ii) the variables are integrated of different order, it is possible to conclude they are not cointegrated, and (iii) both variables are integrated in the same order, then the step two will be proceed.

Step 2: if the result of step 1 indicate that both variables are integrated in the same order, the next step is to estimate the long-run equilibrium relationship in the form:

$$Y_t = \beta_1 + \beta_2 X_t + e_t \tag{3}$$

If the variables are cointegrated, OLS regression can be used to estimate the cointegrating parameter $\hat{\beta}_2$.

Step 3: to perform a Dickey-Fuller test to the residual series obtained from the equation (3) to determine their order

of integration. The form of DF test is the following:

$$\Delta \hat{e}_t = a_1 \hat{e}_{t-1} + \sum_{j=1}^{n} \delta_j \Delta \hat{e}_{t-i} + v_t \qquad (4)$$

Step 4: if the variables are cointegrated, the residual from the equilibrium regression will be used to estimate the error correction model and to analyse the long-run and short run effects of the variable.

The relationship between Y_t and X_t with an error correction model (further ECM) is specified as:

$$\Delta Y_t = a_0 + b_1 \Delta X_t - \pi \hat{u}_{t-1} + Y_t \qquad (5)$$

In this model, b_1 is the impact multiplier (the short-run effect) that measures the immediate impact that a change in X_t will have on a change in Y_t. On the other hand π is the feedback effect, or the adjustment effect, and show how much of the disequilibrium is being corrected, i.e. the extent to which any disequilibrium in the previews period effects any adjustment in Y_t.

In the present study, the elationship between the tested variables are as follows (Table 1):

Table 1. Granger Causality Relationships test between the variables

Variable 1	Variable 2
Regional GDP	Export or Import
Regional GDP per capita	Export or Import
Employment	Export or Import
Total Poverty	Export or Import
Urban Poverty	Export or Import
Rural Poverty	Export or Import

OLS (ordinary least square) model that will be used in general is:

$$Log\, Y_i = Log\, \alpha_i + \beta_i Log X_i + u_i \qquad (6)$$

re-formulated as:

$$Y_i = \alpha_i X_i^{\beta_i} u_i \qquad (7)$$

Where, Y_i is the Regional GDP, Regional GDP per capita, employment or head count poverty, X_i is the export value or import value in real IDR. In case there is a bi-directional Granger causality, Y_i will be the export or the import and X_i is Regional GDP or Regional GDP per capita respectively.

From the above equation, β_i is the coefficient X_i as well as the elasticity of the export value and import value of Regional GDP, Regional GDP per capita, employment or head count poverty. If the exports or imports values rose by 1 %, then it is expected that the employment rate will rise by βi %, while the head count poverty rate will drop by βi %. Particularly for poverty, this procedure is operated to North Sumatra (total poverty), then to urban and rural areas respectively.

The data on regional GDP, employment and head count poverty were collected from *North Sumatra in Figure* while export and import data were obtained from *Foreign Trade Statistic - Exports/Imports of North Sumatra* each published by *Statistic Agency of North Sumatra Province* (BPS) in various year issues.

RESULTS AND DISCUSSION

Since the colonial era, North Sumatra has been engaged in an international trade. Palm oil was first commercially its line of business in 1911. Its total land area and its total production at that time grew significantly since *request from the world market* continued to increase. The Dutch colonial government made the east coast of Sumatra, especially Deli as the hub for palm oil production (Badrun, 2010). In the last 17 years (2000 - 2016), Trade Index that served

as openness parameter {(Export + Import)/ Regional GDP} of North Sumatra ranged between 50 - 78, while Export Index (Export/ Regional GDP) was 34 - 44. The exports proportions in Regional GDP was way above Indonesia's average. The volumes and the value of both exports and imports continued to increase and the balance of trade has always experienced a surplus, while Indonesia experienced a deficit in the balance of trade in 2012 - 2014.

Exports were dominated by industrial sector with the proportion between 76 - 86 % followed by agricultural sector by 11 - 19 %. Likewise, industrial products exported were dominated by intermediate goods (raw material) for further processing since the proportion of exported commodities were based on types of goods which were dominated by raw materials (70 - 78 %) while

the composition of consumed goods (final goods) was just around 23 - 29 % (figure 1).

Two-thirds of the export values are sourced from oil and vegetable fat and crude rubber, synthesis and additions of groups of goods code number 1 and 2 on SITC double digits. By classifiying exports goods into five levels of industrialization based on SITC single digit goods group in compliance with Athanasoglou et al. (2010), I for Foodstuff (product code number 1, 2 and 5 on SITC single digit) , II for raw materials excluding fuel (3), III for Chemicals (6), IV for Machinery group (8) and V for Manufactured product (7 and 9), it was revealed that agriculture-based foodstuff product is not only the dominant group but also showed a very rapid growth. While exports for industrial manufactured products (V) continuously suffered a decline on a lower level (figure 2).
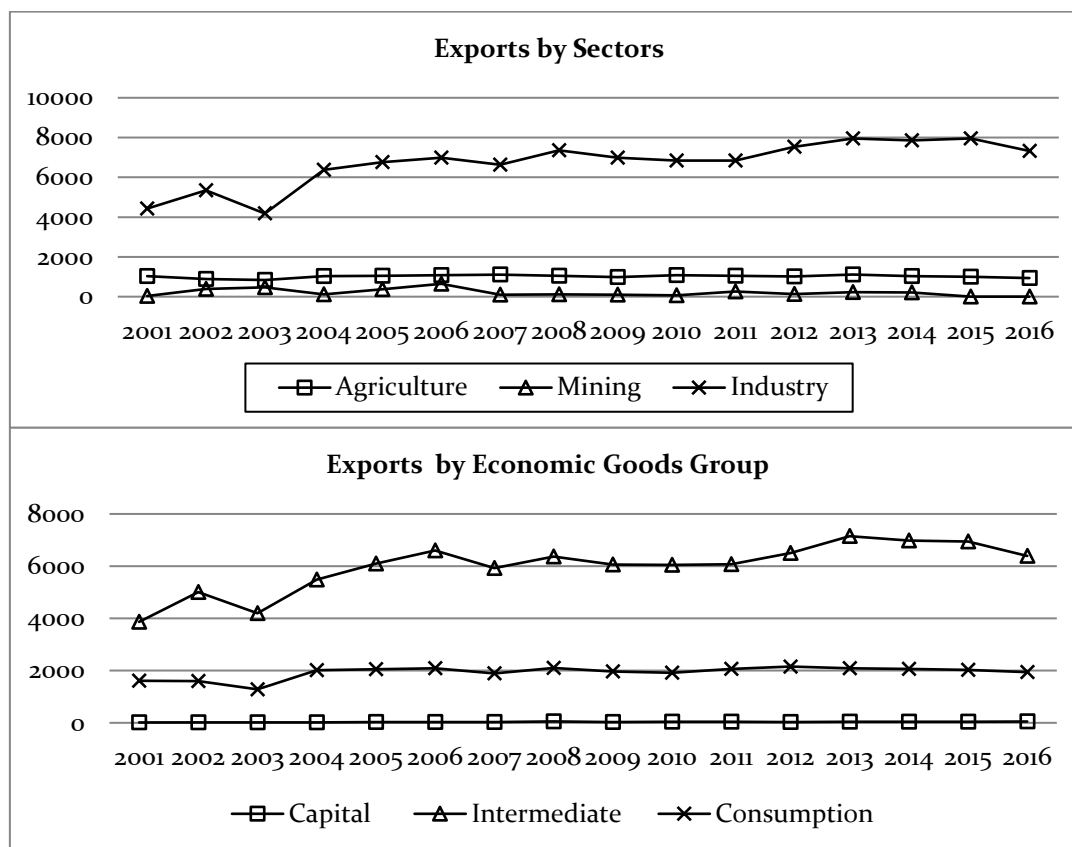

Figure 1. Composition of North Sumatra exports according to the sector and types of goods, 2001-2016 (in thousand Tons)
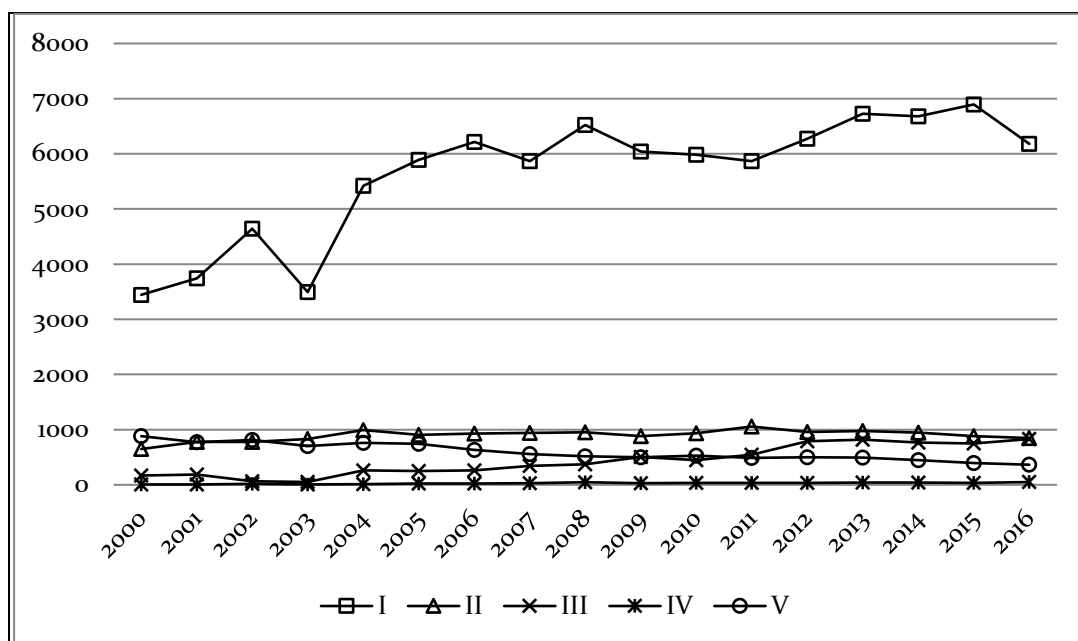
Figure 2. Composition of North Sumatran exports by Levels of Industrialization, 2000 – 2016 (in thousands of tons)

Note: The product categories presented here correspond to the single digit SITC codes in parentheses, as follows:

    I.   Foodstuff products: food and live animals (1), beverages and tobacco (2) animal and vegetable olis/fats (4).
    II.   Inedible raw materials excluding fuel (3).
    III. Chemicals: chemical and pharmaceuticals (6).
    IV. Machinery: machinery and transportation equipment (8).
    V.   Manufactured products: manufacture goods (7) and miscellaneous manufactured goods (9).

The composition of North Sumatra's import showed a similar pattern to that of the composition of exports, where the proportion of imports are dominated by industrial sector yet in the form of intermediate goods (raw materials) by 39 - 63 % and consumer goods (final goods) by 18 - 34 % and the remaining are capital goods by 13 - 32 % (figure 3). With this composition of exports and imports, it is expected that exports and imports related to the economic activity especially the processing industry will have a positive effect on providing employment opportunity and further poverty reduction through employment.

The result of the relationship between the variables indicated that almost all variables hold causality between exports or imports with Regional GDP, Regional GDP per capita, Employment and Poverty respectively. There is a bi-directional causality relationship between Regional GDP and imports. There is no causal relationship between Export and Regional GDP as well as between Export and Regional GDP per capita, however the cointegration between those both variables pairs is existed. The relationship between variables indicated is summarized in Table 2.
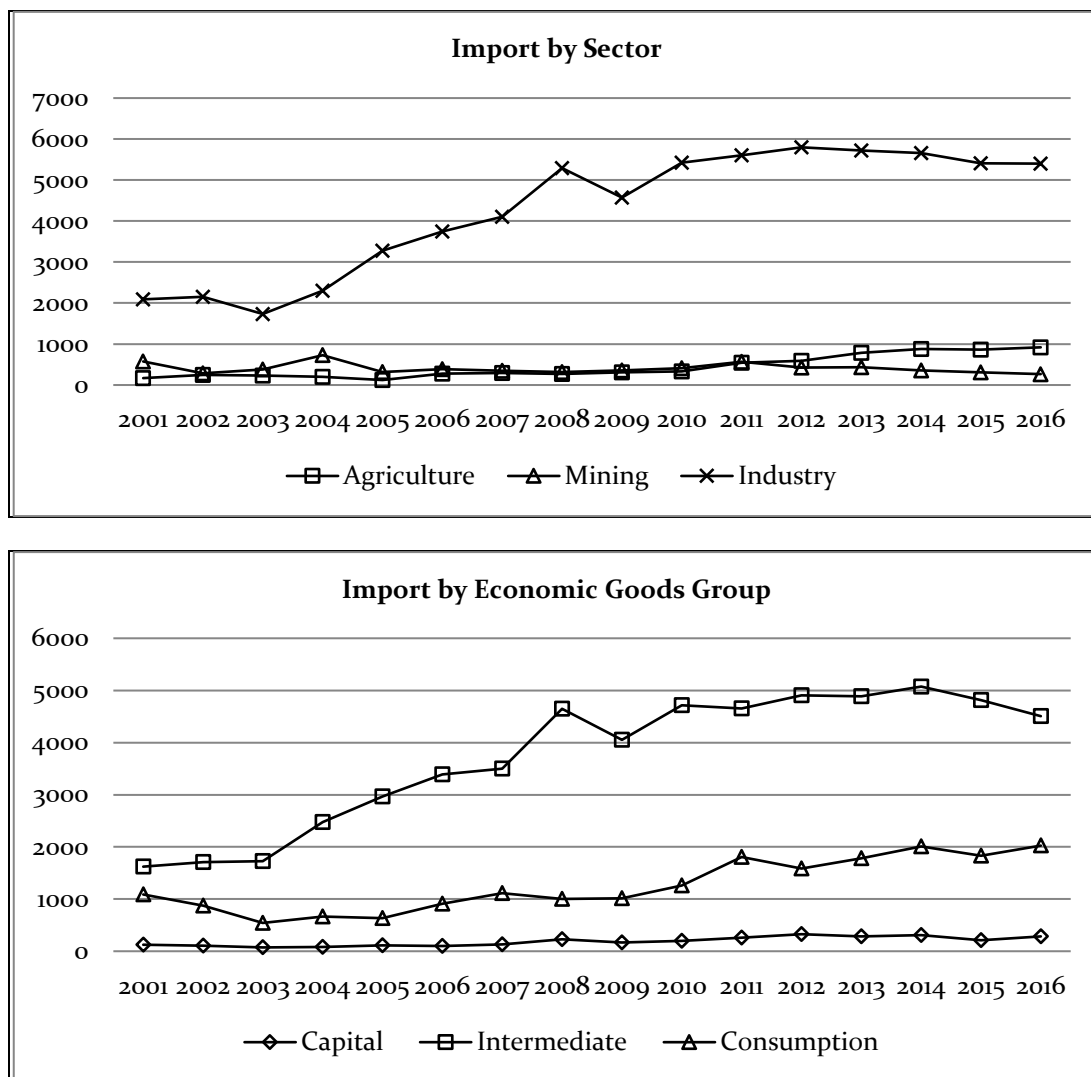
Import by Sector

Import by Economic Goods Group

Figure 3. Composition of North Sumatran imports according to the sector and types of goods, 2001-2016 (in thousand tons)

Table 2. Granger Causality Test Result

Variable 1	Variable 2	Test Result
Regional GDP	Export	no Granger causality*
Regional GDP	Import	bi-directional causality
Regional GDP per capita	Export	no Granger causality*
Regional GDP per capita	Import	one direction causality
Employment	Export	one direction causality
Employment	Import	one direction causality
Total Poverty	Export	no Granger causality*
Total Poverty	Import	one direction causality
Urban Poverty	Export	one direction causality
Urban Poverty	Import	one direction causality
Rural Poverty	Export	one direction causality
Rural Poverty	Import	one direction causality

*) further test indicated cointegration between variables.

The results of parameter estimation showed an effect of trade on economic growth in North Sumatra are presented in Table 3. As it was hypothesized, with the composition of exports dominated by industrial goods, even if it is simple processed intermediate industrial goods, the exports have a positive and significant effect on economic growth (measured in Regional GDP and Regional GDP per capita). The same is true for import, with the composition of imported goods dominated by raw materials for further processing and with a small proportion in the form of capital goods, the imports are mainly aimed at meeting the demands of industry. Industrial activities that produce added value and absorb manpower will have a positive and significant effect on economic growth. On the other hand, a significant economic growth will increase the demands for imports over proportionally, where each economic growth measured in the increased of Regional GDP by 1 % will soon increase imports by 1.44 %.

From the composition of exports and imports, the effect of exports or imports on economic growth and employment can be easily forcasted. But as for poverty, it is not as simple as that. The effect of processing industrial activity for the production of export commodities or for further processing of imported raw materials will not be of poverty reduction if both industries require skilled labors (Winters et al. 2004 and Anderson et al. 2005). Overall, the exports and imports reduce poverty in North Sumatra. But this effect is more evident in rural areas as compared to urban areas. As to the economic growth and employment rate, the effect of exports to reduce poverty is higher and more significant than the effect of imports. This indicates that an increased production of processing industry in catering to exports growth will create more employment opportunity in the upstream sector (a relatively labor-intensive agriculture with unskilled labor qualification) rather than in the processing industry (plants) which is more capital-intensive with skilled labor qualifications that serve machinery and management supply chain from pabric to harbor. In this case, poverty reduction is achieved through employment.

Table 3. Results of Parameters Estimates of the effect of trade on economic growth and employment, North Sumatra, 2001 – 2016

Model: $Yi = \alpha_i X_i^{\beta i} u_i$			
Y	*X*	*β*	*R²*
Regional GDP	Export	0.9583	0.9798
Regional GDP	Import	0.6758	0.9744
Import	Regional GDP	1.4419	0.9744
Regional GDP per capita	Export	0.8376	0.9776
Regional GDP per capita	Import	0.5912	0.9738
Employment	Export	0.1563	0.7381
Employment	Import	0.1140	0.7857

Source: Author's calculation.
Note: *) All coefficient estimation significant at level of confidence 99 % ($\alpha = 0.01$)

Agricultural census of 2013 revealed that in North Sumatra, 938.842 households involve in smallholder plantion, who run more than 800.000 hectares of palm oil and rubber production. Therefore, any increases in price due to increasing demand in agro-industry sector to response to the global demand, will benefit millions of people in term of employment and income, which lead to poverty reduction. Most of these people are living in rural area. Results of parameters estimation of the effect of trade on poverty reduction in North Sumatra are presented in Table 4.

Table 4. Results of parameters estimation of the effect of trade on poverty reduction in North Sumatra, 2001-2016.

Model: $Y_i = \alpha_i X_i^{\beta i} u_i$			
Y	X	β	R²
Poverty (total)	Export	- 0.2524***	0.8114
Poverty (total)	Import	- 0.1829***	0.8515
Urban Poverty	Export	- 0.0913*	0.2025
Urban Poverty	Import	- 0.0611*	0.1815
Rural Poverty	Export	- 0.3676***	0.7535
Rural Poverty	Import	- 0.2698***	0.8121

Source: Author's calculation

Note:

***) coefficient estimation significant at level of confidence 99 % (α = 0.01).

*) coefficient estimation significant at level of confidence 90 % (α = 0.10).

CONCLUSION

The magnitude of the value of North Sumatra's exports since 2000 was at an average of 40 % of the Regional GDP, with the composition of export volume by 75 % of the intermediate goods processed from natural resources, especially fresh palm oil fruits into crude palm oil (CPO) and latex into crumb rubber on one hand and on the other hand, the imports value reached an average of 28 % of Regional GDP with the

composition of imports volume of 72 % of intermediate goods will be the raw materials for further processing industry and 3.5 % of capital goods. It is forecasted that the North Sumatra's exports and imports will have a positive and significant effect on economic growth, as the exports and imports activities are dominated by processing industry activities. The results of the analysis discovered that there is a high elasticity of exports and imports to Regional GDP and Regional GDP per capita with the value of 0.96 and 0.84 for exports and 0.68 and 0.59 for imports.

Likewise, the effect of exports and import on employment is not too significant. The elasticity of exports to employment is only 0.16 and the effect of import is 0.11. Therefore, the effect of exports and imports on Regional GDP is scantily achieved by the absorption of labor in the processing industry sector. The analysis of poverty reduction provides an indication that the exports and imports are more influential in the factors market for raw materials. Increased exports increase the demands for raw materials, which for the case of North Sumatra is dominated by agricultural based natural resources in the forms of palm oil fresh fruit and raw latex. Increased demands will increase the prices and subsequently increase farmers' income and thereby reduce poverty. This mechanism leads to poverty reduction through higher export or import in rural areas rather than in urban areas. It means that North Sumatran economic growth that emanates from international trade is dominantly benefited by rural farmers.

The results of classification of exports based on the levels of industrialization indicated that there is a structural problem

in the economy of North Sumatra. Manufactured goods exports seem not only low in proportion, but also continuously declined. This is in line with the decline of industrial sector contribution to the Regional GDP. In 2000, this contribution was 20.52 %, while in 2016, the number dropped by 14.9 %. The trend analysis confirmed this phenomenon with the trend of a significant reduction with coefficient of - 0.5.

In order to be able to make export as engine of growth in North Sumatra, increase income, increase employment rate and poverty reduction rate, some steps need to be implemented.

Household who runs smallholder plantation palm oil and rubber businesses is expecting to be mentoring. The mentoring is intended for main purposes; increased production and replanting of unproductive area. At present, a production gap between smallholder plantation and state own as well as private enterprise plantation reached 30%. This in contrary with total land area under smallhoders' which is doubled (812,328 ha). To catch up with that, smallholder household needs an access to financing and extension education in order to apply appropriate agricultural technicalities. Similar steps can be applied to other six percent of the total area of smallholder plantation (50,354 ha) which is currently unproductive and in need of big funding for replanting. Both of these matters will promote increased production to cater to the needs of the imports and domestic industries that continues to grow.

The increased production and the utilization of unproductive areas are complementary domestic policy to trade policy with partial benefits as it existed nowadays, gains from trade is more benefited by rural population. To be able to increase

gains from trade and have wider benefits, a structural policy reform is needed within the economy of North Sumatra. Industrialization must be encouraged to process more CPOs and crumb rubbers into final goods so that the products manufactured/ exported could move and develop from the types of commodities exported since 100 years ago in the early plantation era of Sumatra, to become more varied and have high added value (two things that guarantee exports contribute to economic growth).

Traditional trade policy such as export promotion and control exchange rates no longer apropriate for the structural reform. Hence, the efforts of local government to bring in investors both foreign and domestic ones to build and operate the further processing industry in North Sumatra are needed.

It is the challenge for the local government to provide hard infrastructures (transport and power/electricity) and soft infrastructure (regulation and incentives) to attract more investors to do business in North Sumatra. Improved transport and market structure, in addition to support exports directly, will also increase the gains from imports in the form of price transmission where local customers can enjoy the benefit of declined prices of imported commodity as the margin between the border price and the consumer price is small. In addition, infrastructure improvement will encourage the development of other sectors outside the sector of international trade.

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