THE IMPACT OF FINAL DEMAND OF INDONESIA'S EXPORTED PRODUCTS ON DOMESTIC INCOME AND EMPLOYMENT

Dampak Permintaan Akhir Produk Ekspor Indonesia Terhadap Pendapatan dan Kesempatan Kerja Dalam Negeri

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Abstract

The conventional trade statistics may lead to an incomplete interpretation on the importance of international trade, due to its recording system and the increasing globalization of production process. The global value chain approach and the World Input-Output Table were employed. This paper aims to estimate the extent to which Indonesia's economy relies on the final demand of the particular export market in term of generating incomes and employment when the fragmentation of global production exists. The results show that value added and employments induced by final demand in advanced economies are higher than those generated by final demand in developing economies. Enhancing production integration within the same region (East Asia or ASEAN) can be an effective strategy to induce higher Indonesia's income and employment directly and indirectly.

Keywords: Value Added, Global Value Chain, World Input-Output Table

Abstrak

Statistik perdagangan internasional dapat menyebabkan interpretasi yang kurang lengkap tentang pentingnya perdagangan internasional, terkait dengan sistem pencatatannya dan semakin meningkatnya globalisasi proses produksi barang. Studi ini bertujuan untuk mengestimasi sejauh mana perekonomian Indonesia bergantung pada permintaan akhir di suatu pasar ekspor tertentu dan dampaknya terhadap penciptaan pendapatan dan lapangan kerja ketika terjadi fragmentasi produksi global. Analisis ini menggunakan pendekatan global value chain dan Tabel Input-Output Dunia. Hasil studi menunjukkan bahwa nilai tambah dan lapangan kerja sebagai akibat dari pemenuhan permintaan akhir di negara maju lebih tinggi daripada yang dihasilkan dari pemenuhan permintaan akhir di negara berkembang. Peningkatan integrasi produksi di wilayah yang sama (Asia Timur atau ASEAN) dapat menjadi strategi yang efektif untuk mempengaruhi peningkatan pendapatan dan kesempatan kerja di Indonesia secara langsung dan tidak langsung.

Kata kunci: Nilai Tambah, Rantai Nilai Global, Tabel Input-Output Dunia

JEL Classification: F10, C67, R15

INTRODUCTION

The world trade constellation has changed due to the rising prominence of developing economies in the global economy. China, India, Brazil, and Russia nowadays become key players as a global engine of growth, especially since global financial turmoil in 2008. Furthermore, these countries are predicted to suppress the G6[1] economies in 2050 and to change the future of global economic landscape (Wilson and Purushothaman, 2003). The fascinating growth of emerging countries gave impacts on the change of trade patterns around the world, including for Indonesia. Looking at international trade data, Indonesia's major exports destinations apparently shift from traditionally relying on the developed countries to the developing countries. Merchandise exports share of Indonesia to Japan, the United States and EU27 in 2008 cumulatively dropped by 10.1% compare to 2000, while the export share to both China and India increased by 7.4% during the same period (UN Comtrade, 2013).

Based on the above international trade statistics, we may argue that the developed economies are losing much of their relative importance to Indonesia's economy during the last decades, particularly after the global economic turmoil. However, this statement based on the conventional trade statistics may not appropriate due to its recording system. It does not provide a complete picture of the impact of trade on economy[2] in the era of the so-called global value chain.[3]

In this perspective, the relation between an exporting country and an importing country is represented not only by the direct trade flows but also by the indirect trade flows. This is due to the fact that the process of production of goods is no longer entirely completed by one company in a single country, but it is now produced by many companies in several countries.

However, the international trade statistics only capture the direct effect between the two trading partners without further distinguishing the trade flows into intermediate goods or final goods. This would undermine the indirect impact on the importance of the third country in which the underlying export product will finally be consumed. Therefore, the international trade statistics has its own limitation to capture inter-linkages demand across countries, particularly in the globalization era in which the production processes are connected worldwide. On the contrary, the global value chain concept would have different perspective in which the decline of Indonesia's

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[1] The member countries of G6 are the USA, Japan, UK, Germany, France and Italy.

[2] Many researchers have criticized the measurement of international (gross) trade statistics and employed it as the background of their studies, among others are Pula and Peltonen (2009), Maurer and Degain (2010), Koopman, Wang, and Wei (2012), Johnson and Noguera (2012), and Armstrong and Burt (2012).

[3] The issue of the global value chain has been extensively studied under various terms, such as global production sharing, multi-stage production, fragmentation, slicing up the value chain, outsourcing, offshoring, second unbundling, trade in task, or vertical specialization (Hummels, Ishii, and Yi, 2001 and Stehrer, Foster, and de Vries, 2012). The configuration of the production can be a sequential process from an upstream to a downstream stage ("snakes"), an assembling process of parts from different sources with no particular order ("spider"), or a combination of the both types (Baldwin and Venables, 2010).

exports to developed economies in terms of international trade statistics might not necessarily represent the real decline of those economies contributing to Indonesia's economy. In addition, the developed countries might be still the main end-buyers (final demand) for Indonesia's export products.

As an illustration, suppose that Indonesia produces natural rubber and exports it to China. The material is then to be transformed into soles of rubber and used for producing footwear. Afterwards, the footwear is not only sold domestically in China but also exported to the United States (US). In this example, Indonesia has a direct trade relationship with China and has an indirect trade relationship with the US. However, international trade statistics only portrayed the trade relationship between Indonesia and China, and between China and the US. If the amount of footwear exported to the US is higher than the ones sold in China's market, the ultimate demand of Indonesian rubber is much driven by the consumer in the US. As a case, suppose that the purchasing power of the US consumers decreases (due to, for example, the economic recession), the imported footwear with soles of rubber from China also declines. Subsequently, it reduces the demand on Indonesian natural rubber.

Considering those backgrounds, this paper would like to analyze the extent to which the final demands in advanced and developing economies have direct and indirect impacts on Indonesia's income and employment using the global value chain concept. By modeling trade in the global input-output linkages, it is expected to give more complete figures of the effect of ultimate demand in advanced and developing countries on Indonesia's incomes and employment. Diversifying market destination becomes a growing issue for policy makers in response to the recent global economic crisis, especially promoting export to developing countries, which is perceived to have strong economic growth. One of Indonesia's priorites on the foreign trade policies is to diversify export markets in such a way that Indonesia would not much rely on certain destination countries as well as to promote export to the final destinations in which the products would be consumed (Ministry of Trade, 2010).

LITERATURE REVIEW

The evolving structure of current global trade is characterized by the diffusion of key players in global trade, increasing trade interconnection, growing role of global supply chains, and diffusion of high-technology exporters (Riad et al., 2012). Slicing up global production stages, which allows for specializing in specific tasks along the global production chains, is one of the important new natures of international trade (Hummels, Ishii, and Yi, 2001). The specialization of activities in which countries have the highest competitive level is needed to reap the benefit of globalization since the international competition is likely to occur between workers performing the same tasks in different nations (trade in tasks) rather than competition among factories/sectors in different nations (trade in goods) (Baldwin, 2006). Therefore, one can argue that country's competitiveness should be based on activities in global production in generating incomes and jobs, rather

than relied solely on a country's share in world exports (Timmer et al., 2012b).

The emerging global production fragmentation[4] brings an important consequence as international trade statistics may lead to misleading interpretation of the importance of trade on economic growth. International trade statistics calculate the value of gross trade when the physical goods pass through a country's border (Maurer and Degain, 2010). If the transformations of inputs require a production process which involves many countries, then the total trade flows are calculated multiple times (double counting), and it is likely to be inflated. This is due to the fact that the increasing global value chain leads countries to export significant intermediate goods.

In addition, the existence of the global supply chain blurs the concept "country of origin" because products are no longer made in certain sinlge country, but rather they are made in the world (WTO and IDE-JETRO, 2011). Custom authorities consider "country of origin" as the last processing country irrespective of its relative position within the global value chain (WTO and Commission des Finances du Sénat, 2011). Hence, gross trade statistics does not portray a complete picture of the real trade partner where the product is produced. Moreover, the grouping of transactions on the traded goods causes the gross trade statistics to misrepresent the relative importance of some sectors in international trade (Armstrong and Burt, 2012). This is because the processing of goods also involves service sectors (non-tradable goods) which can be the most dominant production factor in the respective countries.

The limitations of gross statistics in providing a more complete picture of the role of international trade become a point of departure for many parties (particularly scholars) to construct a new measure that represents the latest international trade developments. This new trade measurement based on value added solves the 'double counting' problem embedded, due to its recording system, on the gross trade statistics.

This new approach estimates the value-added by each country (and industry) within stages of an international production process. The imported inputs (completed in the previous stages of production by other countries) used in producing goods for export by the respective country are not counted. In this circumstance, the value added could be seen as a compensation for the production factors (labor and capital). It implies that the consumption of goods in importing country does not only induce income but also generates employment in exporting country where the production takes place. These linkages are illustrated in Figure 1.

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[4] Increased fragmentation of global production is among others driven by improving Information and Communication Technology (ICT), decreasing transportation costs, as well as increasing trade and investment liberalization practices (Armstrong and Burt, 2012).
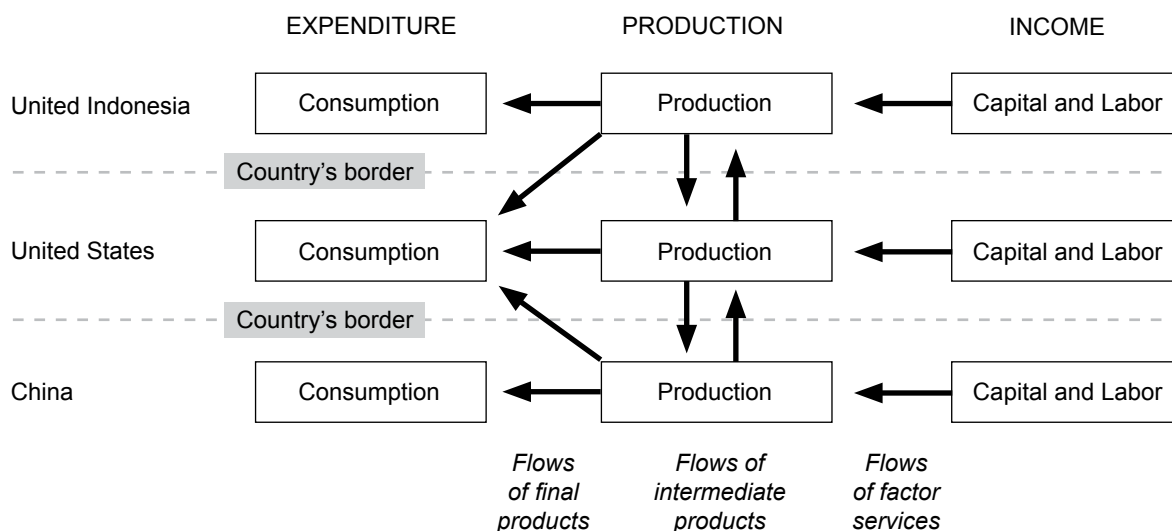
Figure 1. Global Value Chain: Relations between Expenditure, Production, and Income

Source: Adapted from Timmer et al. (2012a)

In the fragmented global production, the flows of products and services can be presented as arrows in Figure 1. The demand of consumption goods in the United States stimulates either domestic production (US) or foreign production (Indonesia and China). In this case, the US can directly import final goods from Indonesia and China, or they can import intermediate products to be processed domestically. Hence, the flows of international trade do not only occur in the final products but also in the intermediate products. The highly fragmented production would lead more countries to participate in the value chain as well as increase trade in intermediate inputs. In short, the production activities (tasks) which are now fragmented across countries would in turn lead to the utilization of capital and labor to create value added at each stage of production in the respective countries. One can also read the opposite direction of arrows in Figure 1 as flows of payments. For instance, consumer's expenditure on

the final goods in Indonesia will generate compensations for the capital owners and labors, which involve in domestic production and/or production abroad. It also allows for indirect trade (no arrows of final and intermediate products) between Indonesia and China through the third country (the US) as a hub.

RESEARCH METHOD

This section firstly discusses a brief explanation of the structure of World Input-Output Table, as well as the way to read this table. Afterwards, it explains the method of analysis used to calculate value added exports. It also deals with the data source and computer program used for the study.

Schematic World Input-Output Table Input-Output Table (IOT) represents economic transaction activities in a given area at a point in time (snapshot). Rows on the IOT represent the selling sectors that produce or deliver outputs, whereas the columns show the purchasing sectors that use or buy those outputs.

Purchasing sector can be an industry or a final consumer (households, companies, and government) representing the demand of goods. The goods produced by a manufacturer can be purchased by other manufacturers as an input in their production (intermediate demand). The goods can also be used by consumers in the final form (final demand). The flow of goods is usually measured by the monetary unit using double entry book keeping system so that the total output produced by selling sectors equals to the total inputs used by purchasing sectors. The further fundamental construction and analysis on IOT can be seen in Miller and Blair (2009).

Since the IOT portrays economic transactions in a specific area, we can assign National Input-Output Table (NIOT) for a country and World Input-Output Table (WIOT) for the world/international. In principle, the building blocks in the WIOT are same as those in the NIOT. There are intra and inter-industry linkages describing the use of output for each sector in production process (intermediate input) and also the flow of product to the consumers as a final use. The origin of intermediate input as well as the flow of final consumption are detached between domestic and foreign. However, WIOT explicitly specifies the country origin of imported products and country destination of exported products. Therefore, we prefer using the WIOT in this study.

Figure 2 provides general structure of WIOT which is simplified into three countries (Country 1, 2, and 3) and two industries (Industry 1 and 2). The variables of f, z, v and x represent intermediate goods, final goods, value added, and input/output respectively. Similar to a standard input-output table, rows in WIOT represent the flow (use) of outputs from given industry whereas the columns indicate the origin (input) from a particular industry. The superscript in the intermediate use indicates the flow of transaction between countries while the subscript denotes the transaction between sectors. For example, z_{21}^{13} represents the value of intermediate good produced by Industry 2 in Country 1 that is exported to the Country 3 and used as input in Industry 1. The output of Industry 2 can be also served as final use which is consumed domestically in Country 1 indicated by f_2^{11}.

Form the first row in Figure 2 we can see the flows of output produced by Industry 1 in Country 1 used as intermediate input for domestic production (z_{11}^{11} and z_{12}^{11}) and production abroad (z_{11}^{12}, z_{12}^{12}, z_{11}^{13}, and z_{12}^{13}). In addition, the output of Industry 1 in Country 1 can be also served as final use which is consumed domestically (f_1^{11}) and internationally or exported to other countries (f_1^{12} and f_1^{13}). Therefore, the use of output in the first row is equal to the total output of Industry 1 in Country 1. In another way, we can read it on the column-base, describing the sources of a given output for the intermediate and final use. Taking the first column as an example, the output produced by Industry 1 in Country 1 comes from domestic intermediate input (z_{11}^{11} and z_{21}^{11}) and imported intermediate input (z_{11}^{21}, z_{21}^{21}, z_{11}^{31}, and z_{12}^{31}). In addition, to produce an output of Industry 1 in Country 1 requires production factors, i.e. labor and capital, which are compensated on the value added v_1^1. Therefore, the total

input of Industry 1 in Country 1 is the sum of all intermediate inputs (domestic and abroad) and the value added (labor and capital compensation). The stylized accounting identity of input-output table implies that the total use of output in row must be equal to the total input in column for the same industry.

		Intermediate Use ($\mathbf{Z}$)						Final Use ($\mathbf{f}$)			Total Output ($\mathbf{x}$)
		Country 1		Country 2		Country 3		Country 1	Country 2	Country 3	
		Ind 1	Ind 2	Ind 1	Ind 2	Ind 1	Ind 2				
Country 1	Ind 1	z_{11}^{11}	z_{12}^{11}	z_{11}^{12}	z_{12}^{12}	z_{12}^{13}	z_{12}^{13}	f_1^{11}	f_1^{12}	f_1^{13}	x_1^1
Country 1	Ind 2	z_{21}^{11}	z_{22}^{11}	z_{21}^{12}	z_{22}^{12}	z_{21}^{13}	z_{22}^{13}	f_2^{11}	f_2^{12}	f_2^{13}	x_2^1
Country 2	Ind 1	z_{11}^{21}	z_{12}^{21}	z_{11}^{22}	z_{12}^{22}	z_{11}^{23}	z_{12}^{23}	f_1^{21}	f_1^{22}	f_1^{23}	x_1^2
Country 2	Ind 2	z_{21}^{21}	z_{22}^{21}	z_{21}^{22}	z_{22}^{22}	z_{21}^{11}	z_{22}^{11}	f_2^{21}	f_2^{22}	f_2^{23}	x_2^2
Country 3	Ind 1	z_{11}^{31}	z_{12}^{31}	z_{11}^{32}	z_{12}^{32}	z_{11}^{33}	z_{12}^{33}	f_1^{31}	f_1^{32}	f_1^{33}	x_1^3
Country 3	Ind 2	z_{21}^{31}	z_{22}^{31}	z_{21}^{32}	z_{22}^{32}	z_{21}^{33}	z_{22}^{33}	f_2^{31}	f_2^{32}	f_2^{33}	x_2^3
Value Added		v_1^1	v_2^1	v_1^2	v_2^2	v_1^3	v_2^3				
Total Input		x_1^1	x_2^1	x_1^2	x_2^2	x_1^3	x_2^3				

Figure 2. Basic Outline of the WIOT

Source: Adapted from Timmer (2012)
Note: the shaded area is inter-industry linkages (use of intermediate inputs in production stages)

Method of Analysis

The amount of value added of a country embedded in the final demand of certain destination market becomes the main concern in this paper. Therefore, it requires an accounting framework taking account inter-industry (intermediate) linkages across countries as well as the goods flows (goods originate) and the use of goods. By following the Global Value Chain concept as developed by Timmer et al. (2012a), one can track the value added generated by a country along the stages of production in different countries.[5] In the initial step, the market clearing conditions for the whole countries need to be set, and the production outputs need to be distinguished into intermediate and final use. The final demand is then allocated based on the group of country destinations in order to calculate the amount of output that should be produced to meet the specific final demand. Because the respective

[5] This paper basically refers to Los, Timmer, and de Vries (2012) in writing the notational input-output matrices as well as the steps to calculate value added.

output contains direct factor input, then the value added can be derived.

The analysis using Input-Output model can be expressed in matrix notation. Therefore, it is important to firstly provide information on some general notations. Based on the common convention, matrices are shown by bold capital letters (Y); vectors by bold lower case letters (y); and scalars in italic lower case letters (y). Vectors are defined as column vectors so a row vector is constructed by transposition indicated by a prime (y'). The diagonal matrices are indicated by a hat above the letter (y) which consists of vector on the main diagonal and zeros on the off-diagonal.

Now, assume that goods flow from source sector as input for sector destination d and move from country origin i to country destination j. The goods circulations can represent intra-industry trade ($s=d$) or inter-industry trade ($s \neq d$) as well as domestic trade ($i=j$) or foreign trade ($i \neq j$). Quantity of goods produced by country i equals to the amount of goods used for both domestic and overseas consumption. Assuming that there is only single price for each product (irrespective of the use) then the value of output of country i at market clearing condition is

$$x_i(s) = \Sigma_{ij} f_{ij}(s) + \Sigma_j \Sigma_d m_{ij}(s, d)$$

(1)

Equation (1) essentially states that the value of output received by producers is the same as the total amount of the consumer spending whether for final consumption (f) and/or for further production process or intermediate inputs

(m). For instance, $x_i(s)$ is production value of sector of country i; $f_{ij}(s)$ is expenditure on final goods from sector s in country j; and $m_{ij}(s,d)$ is expenditure on intermediate goods used on sector d in country j.

In the input-output approach, matrix notation can be used to describe the market clearance condition for S sectors and N countries creating SN dimension. The output value for each country-sector is expressed by the column vector with dimension, while final demand for output is defined in column vector ( ). Finally, the intermediate input linkages are denoted in the global matrix ( ). Each element of the matrix consists of the proportion of the output sector from country which is used for an input sector in country toward total output sector of country , so it can be expressed as . In the input-output notation, the global market clearance condition is as follows.

$$\begin{bmatrix} \mathbf{x}_1 \\ \mathbf{x}_2 \\ \vdots \\ \mathbf{x}_N \end{bmatrix} = \begin{bmatrix} \mathbf{A}_{11} & \mathbf{A}_{12} & \cdots & \mathbf{A}_{1N} \\ \mathbf{A}_{21} & \mathbf{A}_{22} & \cdots & \mathbf{A}_{2N} \\ \vdots & \vdots & \ddots & \vdots \\ \mathbf{A}_{N1} & \mathbf{A}_{N2} & \cdots & \mathbf{A}_{NN} \end{bmatrix} \begin{bmatrix} \mathbf{x}_1 \\ \mathbf{x}_2 \\ \vdots \\ \mathbf{x}_N \end{bmatrix} + \begin{bmatrix} \Sigma_j \mathbf{f}_{ij} \\ \Sigma_j \mathbf{f}_{2j} \\ \vdots \\ \Sigma_j \mathbf{f}_{Nj} \end{bmatrix}$$

(2)

It should be noted that reflects production level in country consisting -vector and represents final demand country of output from country for each sector . Equation (2) can be summarized into

$$\mathbf{x} = \mathbf{Ax} + \mathbf{f}$$

(3)

The equation above represents input-output system in which total output is distinguished into intermediate and

final use. Solving for gross output , the equation can be rewrite as:

$$\mathbf{x} = (\mathbf{I} - \mathbf{A})^{-1}\mathbf{f}$$

(4)

Leontief input-output inverse $(\mathbf{I} - \mathbf{A})^{-1}$ shows the input requirements, both direct and indirect, on all other producers, generated by one unit of final output. Identity matrix $\mathbf{I}$ is $\mathbf{SNxSN}$ consisting of ones on the diagonal element and zero on the off-diagonal elements.

Because the interest of this paper is the final demand in the advanced and developing economies, total outputs are therefore divided into outputs generated due to domestic demand $\mathbf{F}^D$, the final demand in advanced economies $\mathbf{F}^{ADV}$ and the final demand in developing economies $\mathbf{F}^{DEV}$. The decomposition of this final demand can be expressed in the linear system as:

$$\mathbf{x} = (\mathbf{I} - \mathbf{A})^{-1}\mathbf{f}^D + (\mathbf{I} - \mathbf{A})^{-1}\mathbf{f}^{ADV} + (\mathbf{I} - \mathbf{A})^{-1}\mathbf{f}^{DEV}$$

(5)

Value added incomes are generated by pre-multiplying equation (3) with vector $\mathbf{p}$ of $\mathbf{1xSN}$ designating value added per unit output (value added coefficient). Focusing only to the external orientation, the value added created in country i absorbed in final demand abroad (export of value added) is

$$\mathbf{v}_i^E = \mathbf{p}'(\mathbf{I} - \mathbf{A})^{-1}\mathbf{f}^{ADV} + \mathbf{p}'(\mathbf{I} - \mathbf{A})^{-1}\mathbf{f}^{DEV}$$

$$= \mathbf{v}_i^{ADV} + \mathbf{v}_i^{DEV}$$

(6)

Since the concern of this paper is value added creation in Indonesia, so it sets all elements in the vector of value added to zero except for value added $\mathbf{p}$ created by Indonesia. Following the same logic in Equation (6), by replacing elements of vector $\mathbf{p}$ with the relevant vector of factor inputs coefficients, then,the generated employments to satisfy the respective final demand can be derived.

Data

This study uses World Input-Output Table at current prices (WIOT Analytical) retrieved from the WIOD website (http://www.wiod.org/database/ iot.htm) released in April 2012. The WIOT Analytical provides information on inter-industry linkages, final use, total output, and value added. The final use (consumption) of industrial output can be separated into five categories: household expenditure, non-profit organizations serving households (NPISH) expenditure, government expenditure, gross fixed capital formation, and changes in inventories. The WIOT defines economic transactions among 40 countries accounted to more than 85% of word GDP, and it represents the whole economy by adding up rest of the world (RoW). It also covers 35 industries ranging from natural resource, manufacture, and services. Hence, the Intermediate Use matrix in the WIOT has the dimension of 1435 x 1435.

The data on employment are taken from the Socio-Economic Accounts (http://www.wiod.org/database/sea. htm) or commonly called as satellite account which has same data structure (country and industrial classification) to the WIOT Analytical. We prefer using the number of persons engaged (EMP) rather than the number of employees (EMPE) because it represents the whole employment, including self-employed

and family workers. It should be noted that the monetary values in the Socio-Economic Accounts are in the national currency whereas the monetary values in the Socio-Economic Accounts are in the US Dollar (US$). Therefore, we need to convert the national currency into US$ using the exchange rate which is also provided in the WIOD database.

For the purpose of this study, the final demand of advanced economies is set referred to the IMF classification and put the others, including RoW as developing economies. The advanced countries—based upon the IMF classification which are not explicitly defined in the WIOD—consist of Iceland, Israel, New Zealand, Norway, San Marino, Singapore, and Switzerland.[6] Among these countries, Singapore is the most important trade partner for Indonesia.[7] Nevertheless, it is argued that the classification will not lead to the bias results because the calculation of trade flows in this study is based on the final demand absorbed into the destination market. It should be noted that Singapore is one of the main re-export countries[8] which relies much on the imported intermediate inputs (Choy, 2009). Re-export activity is part of the double-counting problem embedded in the gross trade statistics which will cause distorted picture on the how much of the exporting country depends on the foreign market.

The new sub-category for advanced economies can further defined into mature markets (G7) and other advanced economies as well as the sub-category for developing economies into emerging markets (BRICMT) and other developing economies. This decomposition aims to know the extent of impacts that the respective markets have on Indonesia's economy in terms of incomes and employment. It is also possible to obtain information about the products/sectors (agriculture, manufacture, and services) of related trading partners of which Indonesia has benefited the most.

In rder to calculate Indonesia's value added income and employment induced by the underlying export markets, Scilab program is utilized. Scilab is a freeware program which has more or less the same function as the popular commercial of Matlab package and can be downloaded from http://www.scilab.org. This program makes computation easier in matrices. In particular, Scilab version 5.3.3 is used because it provides an additional module for reading Excel-files into Scilab as well as for writing the results to Excel-files.

RESULTS AND DISCUSSIONS

Impact of Foreign Demand on Indonesian Income and Employment

Before discussing the magnitude of dependency of Indonesia's economy toward export markets, it is better to first

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[6] Hong Kong is also included as an advanced country on the IMF classification. However, in the WIOD, Hong Kong data have been combined into the Chinese trade data (Timmer (Ed.)., 2012).

[7] Based on the UN Comtrade database, Singapore is Indonesia's fourth largest export destination in 2009 which accounted to US$ 10 billion or 8.8% of Indonesia's total export to the world.

[8] Trade data from the Singapore Department of Statistics (http://www.singstat.gov.sg) shows that almost 50% of the Singapore's total exports to the world in 2009 are come from re-export item.

compare the results with related existing literatures. By doing this benchmarking, the reliability of the results can be assured as well as can be used to to avoid fallacy on the interpretation. In this respect, the study by Johnson and Noguera (2012) is one of the literatures used in the analysis.

Johnson and Noguera (2012) define value added exports as value added produced in the source country and absorbed in the destination country. In addition, they calculate the ratio of value added exports to gross exports (called as "VAX ratio") to measure the intensity of production sharing. The VAX ratios are low when intensity of production sharing is high. The ratio can be lower or higher. For the aggregate level, the ratio is always smaller than the one as found in Johnson and Nogurea (2012). However, in the sector-level, the ratio may pose value greater than one, particularly in the agriculture & natural Resources and services. It is because manufactures, which are directly exported, contain value added from other sectors. The higher gap between gross exports and value added exports means that the gross export statistics will lead to more bias in capturing the real trade flows.

Following their works, the ratio of Indonesia's value added exports absorbed in the foreign final demands to Indonesia's gross exports is the calculated. Surprisingly, the result on the value added to gross exports ratio for Indonesia in 2004 was 0.79, same as what Johnson and Noguera (2012) found. Recalling that result, this study uses WIOD database while Johnson and Noguera (2012) use GTAP database to calculate value added exports. In

general, the average ratio of Indonesian value added exports to fulfill the foreign final demand toward its gross exports during 1995-2009 was 0.82. In other words, Indonesia's value added exports was 18% lower than gross export statistics, confirming to the notion given by Johnson and Nogurea (2012) that value added exports are smaller than gross exports at the aggregate level.

Table 1 provides Indonesia's value added exports and gross exports of a particular market destination during 1995-2009. Both measures indicate that the trend of Indonesia's exports to developing countries is almost four times faster than the trend of exports to advanced countries (panel a and b). Indonesia's value added exports to advanced economies during 1995-2009 grew slower (4.3% per year) than those in developing countries (15.3% per year). After the global economic recession 2008, both final demands in advanced and developing economies have been equally important for Indonesia's income. It is indicated by the relatively similar amount of value added exports generated in advanced and developing economies of USD 59.2 billion and USD 55.9 billion respectively. Before that, the developing economies had been much less important for Indonesia than advanced economies, even in 2005.

By comparing the value added exports and gross exports as shown in Table 1 panel c, it can be implied that the production sharing intensity on Indonesia's exports to developing economies is higher than the export to advanced economies. On average, the ratio of Indonesia's value added exports to the gross exports attributed to

developing economies was 0.78, lower than the ratio attributed to advanced economies which amounted to 0.84. The smaller ratio indicates the higher intensity of production sharing across countries. This is probably due to the fact that a lot of materials and intermediate goods were imported into Indonesia before being processed and then exported to developing economies.

Panel d on Table 1 indicates the relative contribution of Indonesia's value added exports toward Indonesia's economy. For example in 2000, Indonesia's value added exports generated from serving the world's final demands contributed to almost 30% of Indonesia's GDP. It was mainly due to the value added exports to the advanced economies (23.4% of Indonesia's GDP). However, in 2009, the advanced economies became less important, as indicated by the lower ratio of Indonesia's value added exports to GDP of 10.5%. On the contrary, the role of developing countries in generating Indonesia's incomes became more important, even though it was not so strong. Despite the dynamic role of foreign final demands toward Indonesia's economy, Indonesia still relied heavily on domestic final demands, which induced to 75% of total value added (on average) during 1995-2009.

To understand whether Indonesia has gained or suffered from global demands, the annual growth of Indonesian value added export-to-GDP ratio is compared to the annual growth of destination market's GDP-to-World's GDP ratio within the same period. The former ratio refers to Indonesia's income from exports to fulfill particular foreign demands, and the latter ratio represents economic condition of the respective export market. This is based on the fact that developing economies are now becoming more important for the global economy. For instance, the share of developing countries' GDP to the world's GDP was increasing at 3.0% per year (Table 1 panel e). Therefore, it can be considered as an advantage for Indonesia if their incomes from export expand faster than the economic performance of a particular market in the global economy. This shows that Indonesia is able to capture market opportunities abroad.

Based on the calculation, the annual decline of Indonesia's value added exports to advanced countries-to-the GDP ratio during 1995-2009 was faster than annual economic growth in that market (comparing item 'd' and 'e' in Table 1). Meanwhile, the trend of Indonesian value added export to developing countries-to-GDP ratio (7.7% per year) grew faster than the trend of GDP in developing countries-to-World's GDP (3.0% per year). These facts show us that Indonesia was severely injured from declining demands in advanced countries. On the contrary, Indonesia benefited for catering market demands in developing countries.

Table 1. Selective Indicators of Indonesian Export Performance and Foreign Market Condition, 1995-2009

Description	1995	2000	2005	2009	1995-2009	
					Average	Trend (%/year)
a. Indonesia's Value Added Exports (US$ billion), to:						
World	45.1	52.0	74.9	115.1	67.8	7.7
Advanced Economies	35.6	40.7	48.0	59.2	44.6	4.3
Developing Economies*	9.6	11.3	26.9	55.9	23.2	15.3
b. Indonesia's Gross Exports (US$ billion), to:						
World	54.1	65.3	93.9	134.9	82.9	7.6
Advanced Economies	42.6	50.5	55.6	66.8	52.6	3.6
Developing Economies*	11.6	14.9	38.3	68.1	30.3	16.4
c. Ratio of Indonesia's Value Added Exports to the Gross Exports, to:						
World	0.834	0.795	0.798	0.853	0.815	0.1
Advanced Economies	0.835	0.806	0.864	0.886	0.844	0.7
Developing Economies*	0.829	0.758	0.703	0.821	0.778	-0.9
d. Ratio of Indonesia's Value Added Exports to the GDP, to:						
World	0.187	0.298	0.270	0.205	0.249	0.6
Advanced Economies	0.147	0.234	0.173	0.105	0.174	-2.6
Developing Economies*	0.040	0.065	0.097	0.100	0.076	7.7
e. Ratio of Foreign GDP to the World's GDP, in:						
Advanced Economies	0.784	0.769	0.734	0.658	0.742	-1.1
Developing Economies*	0.207	0.225	0.259	0.332	0.251	3.0

Source: Author's calculation based on the WIOD Database
Note: * Indonesia is excluded

Turning to the annual results as depicted in the Figure 3, Indonesia's value added exports to the world-to-GDP ratio climbed during 1995-2001 and continued to fall afterwards; resulting in average ratio of 24.9% during 1995-2009. The most visually striking change in Figure 3 is the sharp increase of value added export-to-GDP ratio in 1998. A year after Indonesia had undergone crisis in 1997, the total value added decreased considerably by 60.4%, especially on the value added generated from domestic final demands. At the same time, the value added exports attributed to the final demands abroad experienced smaller drop, thus creating the highest value added export-to-GDP ratio of 35% within the period of 1995-

2009. On the contrary, there was only 65% value added generated to satisfy Indonesia's final demand in 1998. Before that year, the value added reached more than 80% (rest over the bar in Figure 3).

The decomposition of value added export by market for final goods (Figure 3) demonstrates that the role of final demand in advanced economies towards Indonesia's income is declining, while the role of developing economies is increasing. Therefore, there was a switching composition of the Indonesia's value added export to the foreign market from the dependency mostly on advanced economies in 1995 (78.8 % in share) to relatively balanced market dependency, both on advanced and developing economies in 2009. It is

sensible to foster exports to developing economies because their economies continue to grow. In fact, the economic growth in developing economies has been faster than those in the advanced economies, particularly after the Global Economic Recession 2008.
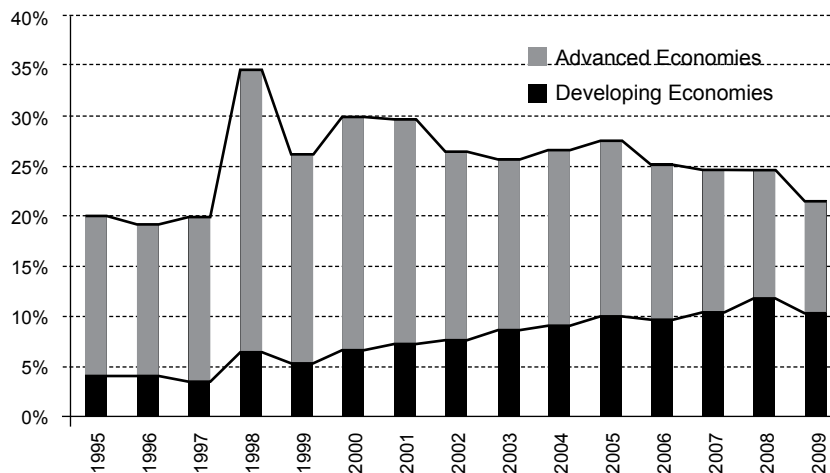

Figure 3. Value Added Exports by Market for Final Goods (% of GDP)

Source: Author's calculation based on the WIOD Database

Note: The bars in Figure 2 depict the share of Indonesia's value added exports induced by foreign final demands in advanced economies and developing economies. The remaining shares of the respective combined bars indicate Indonesia's value added exports induced by domestic final demand. Thus, the summation of the whole shares in each respective year will be 100%.

With regard to employment, Indonesia's export activities contributed to 16.4% of total employment in average during 1995-2009. For the benchmark years that are available on the Indonesia's Input-Output Table, the results are mostly similar to the work of Aswicahyono and Manning (2011). They found that the shares of employments induced by export activities to the total employment were 11.8% in 1995, 19.0% in 2000, and 16.6% in 2005. In this case, most of the results on the respective year are higher than those estimated by Aswicahyono and Manning (2011). Of course, it would not have similar results because of the different databases used.

They used Indonesian Input-Output Table of 66-sector classification. Meanwhile, in this study the World Input-Output Table of 35-sector classification and covered 41 countries (including RoW) is used. In addition, different exchange rate also causes different values of transaction flows on both Input-Output Tables. Therefore, this study claims that the results are better because it considered different export demands from different trade partners. In the International Input-Output setting, not only the direct effects of exporting final goods which can be calculated, but also the indirect effects induced by exports in intermediate goods caused by feedback effect and spillover

effect[9] (Meng, Fang, and Yamano, 2012). Nevertheless, both results have the same magnitude, in the sense that

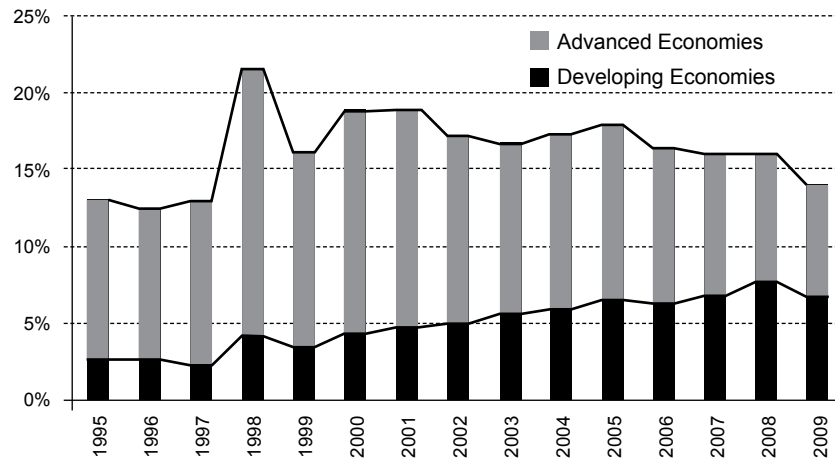employment induced by exports in 2000 was the highest and followed by those in 2005 and 1995.

Figure 4. Employments Induced by Foreign Final Demand (% total workers)

Source: Author's calculation based on the WIOD Database

Note: The bars in Figure 3 depict the share of Indonesia's employments induced by foreign final demands in advanced economies and developing economies. The remaining shares of the respective combined bars indicate Indonesia's employments induced by domestic final demand. Thus, the summation of the whole shares in each respective year will be 100%.

The pattern of employment generated by serving foreign final demands in Figure 4 is almost the same as the pattern of the value added exports in Figure 3. It would not cause much difference whether focusing on the value added export or employment at the aggregate level. When the exports play important contribution to Indonesia's income in certain years, the increasing employment is also visible in the respective year. In 1998, for example, exports contributed mostly to generate income as well as for inducing employment. In contrast, the weak global demands in 2009 led to decreasing contribution of export value added toward Indonesia's GDP as well as

the share of export-related employment toward Indonesia's total employments.

Looking at more details of 1998, the number of employment induced by export activities increased by 67.6% or an additional 7.9 million workers from the previous year. This was because many workers had to switch from formal sectors to the informal sectors due to massive layoff during recession (Feridhanusetyawan, 2002). It should be noted that the employment data used in this analysis refers to the number of people involved in the production activities and is not limited only to employees but also the self-employed workers. The number of persons engaged

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⁹ Spillover effect refers to the exogenous changes in final demand in one country that lead to increasing production in that country and rising imported inputs from other countries. Feedback effect occurs if the production of those inputs in the exporting country also requires imported materials from the originating country.

(EMP) for total industry in the WIOD database showed an increase of 0.7% in 1998 compared with 1997, while the number of employees (EMPE) dropped by 4.3%. To this respect, agriculture, hunting, forestry and fishing sectors had the largest contribution for inducing employment in 1998. It reaffirms that the informal sectors play an important role in creating Indonesia's employment during the Asian Financial Crisis.

Before turning into the next sub-section, it is worth mentioning about the overestimation on the results. Indonesia's value added exports and employments induced by fulfilling final demands in developing economies are slightly overestimated because Rest of the World (RoW) is included in the developing economies category. Most RoW consists of developing countries, but some of them are considered to be advanced countries, i.e. Iceland, Israel, New Zealand, Norway, San Marino, Singapore, and Switzerland. Recalling from the research method section, the advanced economies of which data are not available are also included into RoW in the WIOD database.

The Dominant Export Markets and Sectors for Indonesia's Economy

The further decomposition of final demand indicates that Indonesia's major markets in advanced countries during the period 1995-2009 were concentrated in only G7 countries, particularly in the US and Japan. The average contribution of Indonesian value added exports to the G7's markets was relatively stable at 73.7% of total value added exports to the advanced countries (Figure 5.A).

Therefore, the declining Indonesian value added exports to developed countries markets during 1995-2009 were due to rapid annual drop of the value added export generated in G7 countries (-3.2%) relative to the other advanced countries (-0.9%).

In contrast to the results in advanced economies, the breakdown of final demand in developing economies, which emphasize on Brazil, Russia, India, China, Mexico, and Turkey (BRICMT), did not meet the expectation. The emerging markets of BRICMT gave modest contributions for Indonesia's income during 1995-2009, amounting to 40.3% of total value added exports to developing countries (Figure 4.B). On the other hand, other developing countries had larger contributions in generating Indonesia's income. Further, decomposition on BRICMT countries reveals that China and India contributed 58.8% and 19.6% respectively to Indonesia's income in the category of BRICMT countries. This led to a conclusion that Indonesia's exports to developing countries are much more dependent on Asian markets, especially in ASEAN countries. In addition, there was a sharp increase on Indonesia's export of value added in satisfying final demands for China, from 1.8% of GDP (2004) to 2% of GDP (2005). This may indicate that the commencement of ASEAN-China Free Trade Agreement (ACFTA) in 2004 has substantially impacted Indonesia's income. The tariff reduction under the ACFTA scheme does help Indonesia in boosting export flows directly to Chinese market or indirectly through other ASEAN countries.
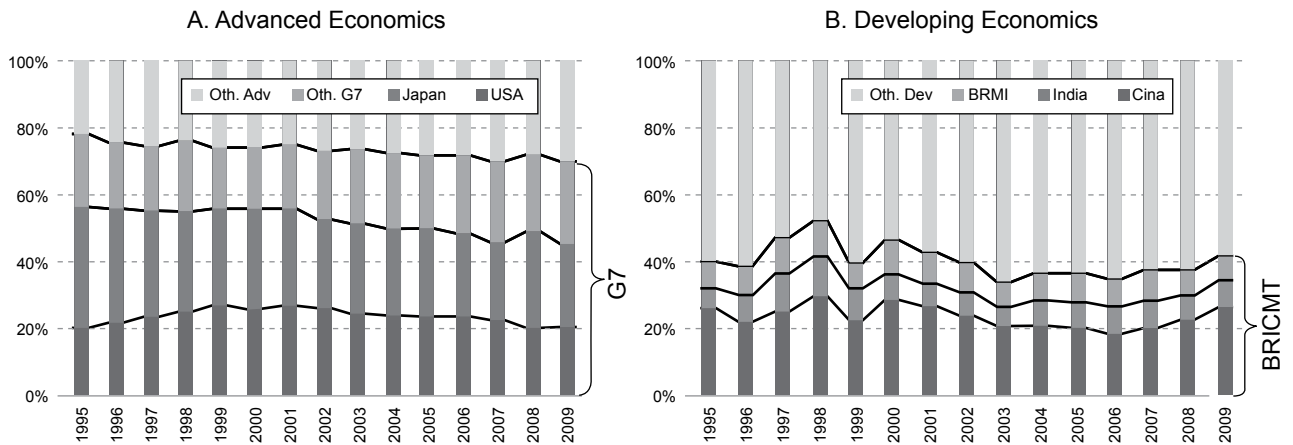
Figure 5. Share of Indonesia's Value Added Exports by Particular Markets for Final Goods

Source: Author's calculation based on the WIOD Database

Notes: BRMT stands for Brazil, Russia, Mexico, and Turkey

Turning to sector decomposition, manufacturing exports to advanced and developing countries still have noticable contribution to Indonesia's GDP. However, the contribution of manufacturing during 1995-2009 tended to decrease rapidly relative to other sectors (Figure 6). The production characteristics of manufactured goods, which are easily to be fragmented across borders and the growing competition among global players, were the possible reasons for the declining export of value added on Indonesia's manufacturing. Along with the decline in the manufacturing and agriculture & mining sectors, the contribution of service sector to the Indonesia's global value chain income in advanced economies also experienced a decrease.
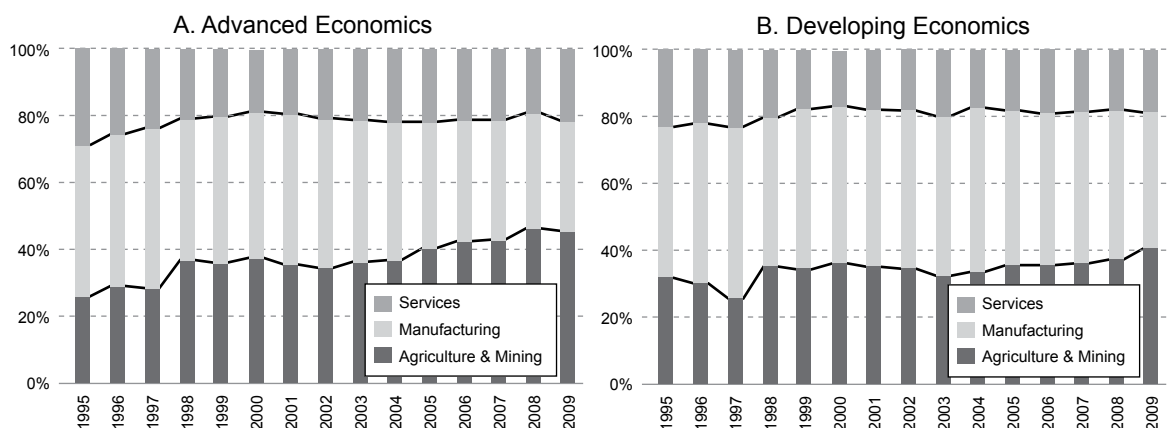

Figure 6. Share of Indonesia's Value Added Exports by Sectors and Markets for Final Goods

Source: Author's calculation based on the WIOD Database

To have better understanding on the impact of final demands in advanced economies and developing economies on Indonesia's economy at detail sector-level, some important export-related activities for Indonesia are presented as shown in Figure 7. The sizes of the bubbles are proportional to the average amount of value added during 1995-2005 in the corresponding sector; the vertical axis shows the annual growth of the sectoral value added exports; and the horizontal axis indicates the annual growth of employment of the respective sector. Irrespective to the market for the final goods, the higher contributors for Indonesian income mainly come from the same sectors (8 of 10 largest sectors). Moreover, they are dominated by natural resource-based products, such as mining, agriculture, and coke & refined petroleum.

Overall, it is obvious that final demands in developing economies tended to induce positive growth for Indonesia's value added and employment in all sectors during 1995-2009. Meanwhile, not all sectoral value added and employment induced by final demands in advanced economies experienced positive growth during the period. For example, the value added exports generated in agriculture, hunting, forestry and fishing (c1) and food, beverages and tobacco (c3) continued to increase during 1995-2009, but the employments created in those sectors tended to decline (Figure 6.A). Mining and quarrying (c2) generated the largest value added attributed to the final goods market both in advanced and developing economies. However, the trend of value added and employment in mining and quarrying induced by final demands in developing countries were faster than those by final demands in advanced countries. This indicates that the market for Indonesia's mining and quarrying products in developing economies was growing and more advantageous to Indonesia's economy in terms of generating value added and employment.
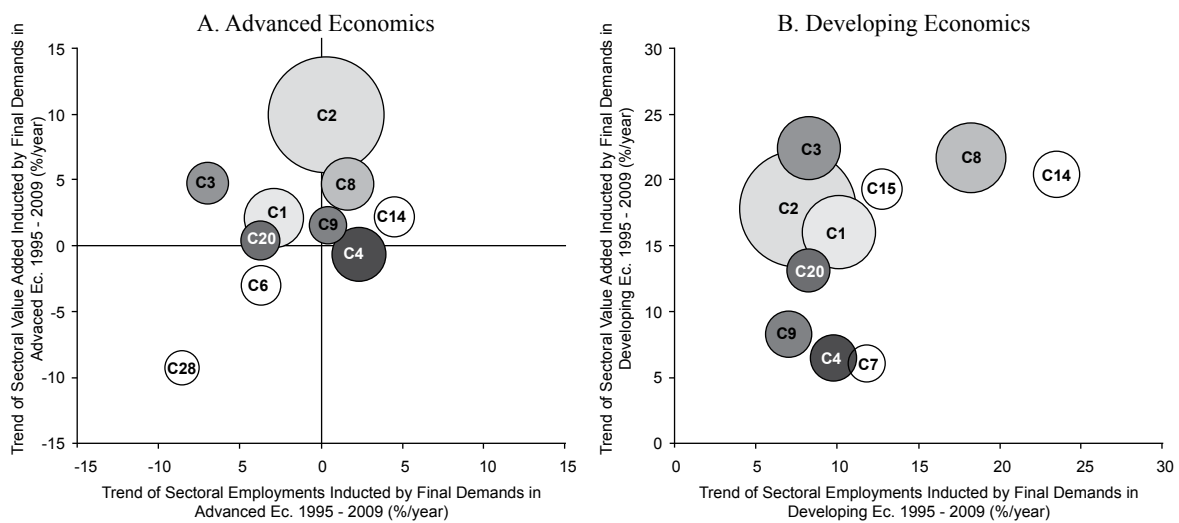
Figure 7. The Development of 10 Largest Sectoral Indonesia's Value Added Exports and Employment Induced by Final Demand in Advanced and Developing Economies

Notes: - Descriptions of the bubbles: (c1) Agriculture, Hunting, Forestry and Fishing; (c2) Mining and Quarrying; (c3) Food, Beverages and Tobacco; (c4) Textiles and Textile Products; (c6) Wood and Products of Wood and Cork; (c7) Pulp, Paper, Paper, Printing and Publishing; (c8) Coke, Refined Petroleum and Nuclear Fuel; (c9) Chemicals and Chemical Products; (c14) Electrical and Optical Equipment; (c15) Transport Equipment; (c20) Wholesale Trade and Commission Trade, Except of Motor Vehicles and Motorcycles; and (c28) Financial Intermediation.
- The 10 largest export-related activities to developing economies covered 74.9% of total value added exports to developing countries on average during 1995-2009, while the average share of 10 largest sectoral value added exports related to advanced economies was 72.4%.

Source: Author's calculation based on the WIOD Database

CONCLUSION AND POLICY RECOMMENDATION

In the last decades, the international organization of production has undergone many changes. The production process is no longer entirely completed by one company in a country but is now taken by many companies in various countries. Consequently, conventional trade statistics may provide less relevant pictures on the importance of trade to an economy when the global production fragmentation presents. It only considers the direct trade flow across borders and cannot measure the impact of final demand of the producing country along the global supply chain. Therefore, it is necessary to use an alternative measure which is able to capture the recent production phenomenon, i.e. value added approach.

The final demands in advanced countries have higher impact on generating Indonesia's income (value added) and employment rather than final demands in the developing countries. However, Indonesia's income and employment induced from catering market in developing economies is growing faster than serving the advanced countries. It indicates that Indonesia has

benefited from stronger demands that currently occurred in most developing countries. Therefore, the author believes that the Indonesian export policy on market diversification to developing countries will continue to have positive impacts on Indonesia's economy. Despite the strong demand in developing countries, it should be cautious that mining and quarrying become the main sector generating higher income and employment in Indonesia. The higher income from this sector is possibly due to the higher international price and exploitation of natural resources rather than due to the down streaming of the production process.

For Indonesia, serving the final demand in developing countries creates a higher intensity of global production sharing compare to serving the final demand in advanced countries. It might indicate that producing final goods for developing countries needs intermediate goods or involves many production stages across countries. Therefore, enhancing production integration within the same region (East Asia or ASEAN) can be an effective strategy to induce higher Indonesia's income and employment directly and indirectly.

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