

Impact of Indonesia-Taiwan Bilateral Cooperation on Indonesia Economy

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ABSTRACT

This study aims to analyze the impact of bilateral economic cooperation between Indonesia and Taiwan on macroeconomic performance and sectoral economics in Indonesia. The inferential analysis is used to ensure that commodities that are ranked as the main results of sectoral selection requests are indeed worthy of being recommended in the Indonesia-Taiwan cooperation scheme. RCA index is one of the proxies used in conducting inferential analysis. The impact of cooperation in trade schemes between Indonesia and Taiwan was obtained from simulation analysis using GTAP version 9. Through the cooperation of Indonesia-Taiwan, Indonesia macroeconomic performance has increased, such as welfare, Gross Domestic Product/GDP, consumption (private and government), investment and inflation in all simulations. Cooperation between Indonesia and Taiwan caused the largest increase in Indonesia output in the sector wearing apparel while the largest export was sectoral oil seeds. Indonesian imports experienced the largest increase in sectoral textiles and the demand for skilled labor increases more than the demand for unskilled labor.

Keywords : CGE, Integration, Liberalization, Macroeconomics and Sectoral

I. INTRODUCTION

Indonesia has abundant natural resources and human resources so that many countries in the world (one of which is Taiwan) are interested in becoming Indonesia trading partners. Taiwan has shown great interest in strengthening bilateral cooperation with Indonesia. Halper (2011); Hong (2011); Ariawan (2012); Cheng and Chow (2014); Deng (2014); Li (2014); Borst and Lardy (2015); To-Hai (2016) observes the development of China's rapidly growing economic system so that China plays an important role in the global economy. China is in the top position as a world trading partner while Taiwan has a vital role in China's economic development in decades (Dent 2005; Tung 2009; Hsu 2010; Bush 2011;

Chen 2014; Tkacik 2014; Karalekas 2016; To-Hai 2016).

If Taiwan plays a vital role in the Chinese economy, Pattiradjawane (2015); Kemendag (2017); Eurasia Review (2018) states that cooperation built directly with Taiwan can boost Indonesia economic growth. Taiwan seeks to reduce its dependence on China to increase its economic growth (Tubilewicz 2015; Marston and Bush 2018). Referring to Dent (2005); Huang (2009); Bush (2011); Phillips (2014); Kruppa (2016); Majoros (2016); MoFA (2018), the strategies taken by Taiwan include joining the WTO and implementing New Southbound Policy/NSP. As explained by Hsu (2010); Bush (2011); Hong (2011); Kabinawa (2013); ITS Global (2014); Hsu (2015); Chen (2016); Aditya (2018); Bilaterals (2018); Bo-jiun

(2018); Chong (2018); Eurasia Review (2018); Hsiao and Yang (2018); Lin (2018); Tso and Jung (2018), the NSP policy was realized through Taiwan's participation in the economic and trade fields that were built with countries in Southeast Asia, especially Indonesia. Taiwan is the 6th main destination for Indonesian exports in 2017 (Figure 1). Referring to version 9 of the Global Trade Analysis Project (GTAP) and World Integrated Trade Solution/WITS (2019), import tariffs in China are relatively small while import tariffs in Taiwan are relatively large for all sectors. According to Aditya (2018), bilateral cooperation between Indonesia and Taiwan allows Indonesia to expand its market share and improve its trade balance through submitting a reduction in import tariffs in Taiwan to export products from Indonesia. The development of Indonesia cooperation scheme with Taiwan has consequences for each country to implement trade liberalization. Trade liberalization is realized through the reduction or elimination of import tariffs and other trade barriers (Ariawan 2012; Zulkarnaen et al. 2012; Lee et al. 2014; Kruppa 2016).

Through bilateral cooperation between Indonesia and Taiwan, the objectives of this study are: 1) To analyze the impact of Indonesia-Taiwan bilateral economic cooperation on macroeconomic performance (welfare, real GDP, consumption, investment, government expenditure, trade balance and inflation) in Indonesia. 2) Analyzing the impact of Indonesia-Taiwan bilateral economic cooperation on sectoral economic performance (output, exports, imports and employment opportunities) in Indonesia.

II. LITERATURE REVIEW

Economic Integration. Achsani (2004) reveals that the phenomenon of globalization cannot be avoided by every country in the world. The current of globalization has prompted various countries to form blocks or schemes of cooperation between countries. The purpose is to strengthen the position of the country in the world economic arena. Globalization

has triggered various countries to open economic integration with other countries. The form of economic integration is for example bilateral, regional and multilateral. The aim of economic integration is to get greater profits from trade schemes so as to improve the welfare of the country's people.

Salvatore (1997) defines economic integration as a commercial policy that discriminates against the reduction or elimination of trade barriers only for members of the Free Trade Area (FTA). The enactment of bilateral cooperation between Indonesia and Taiwan certainly encourages the decline of trade barriers only to the countries of Indonesia and Taiwan, while the state of Rest of the World (RoW) imposes large trade barriers. The occurrence of trade liberalization is expected to spur economic integration through more open trade by reducing various obstacles (Wibowo 2009).

Global Trade Analysis Project (GTAP). The GTAP model and the CGE model use the basic concepts of expenditure and purchase flows between economic actors. Both models are built with microeconomic theory which explains in detail the behavior of each economic agent. The CGE and GTAP models are able to overcome problems related to macroeconomic aspects by using macroeconomic closures. The use of closures to separate endogenous and exogenous variables in the model so as to achieve equilibrium conditions (Oktaviani and Puspitawati 2017).

Firdaus (2011) states that all sets, subset, parameters and nominal form variables (value/levels form) are denoted by capital letters. Lowercase notation to represent variables in the form of percentage change (percentage change) or linear form. According to ITS Global (2014), in the GTAP model there is a database of consumption, production, bilateral or multilateral trade in goods and services, intermediate input between sectors, taxes and subsidies imposed by the government and others.

Wibowo (2009) states that the GTAP model has a model structure and behavior parameters (in the form of elasticity: substitution, demand and

transformation) to determine the mobility level of the primary factors. Brockmeier (2001) describes the condition of the balance of income and expenditure in an open economic system. According to Walmsley et al. (2012), the GTAP database is the center of a global trade analysis project that summarizes the annual flow of goods and services for the entire world economy. GTAP includes bilateral trade, transportation and protection matrices that connect the economic databases of each country or region.

Previous research. Elisabeth (2014) examined the feasibility of the Taiwan-Indonesia economic cooperation arrangement. Simulation analysis with GTAP is used to analyze the impact of cooperation in general balance and aggregate level while the Single Market Partial Equilibrium Simulation Tool/SMART is used to analyze the impact of cooperation in partial and disaggregated levels. Simulation results show that Indonesia macro and sectoral economics were positively affected as a result of Indonesia-Taiwan cooperation. Through the macro economy, namely welfare, economic growth as measured by real GDP and Indonesia inflation rate shows an increase. In sectoral economies, there are 3 sectors that have experienced increased demand for labor (educated and uneducated), namely sectoral wearing apparel, textiles and motor vehicles and parts.

Laksani and Salam (2016) examine the influence of the Association of Southeast Asian Nations (ASEAN)-Hong Kong, the China Free Trade Agreement (AHKFTA) on Indonesia macro economy. The indicators used to measure macroeconomics are welfare, GDP and trade balance. Based on the findings using GTAP version 8, the cooperation of the AHKFTA which reduced the tariff by 50% caused the welfare of Indonesia and Hong Kong to decrease. Full liberalization actually increases Indonesia welfare and GDP but Hong Kong's real GDP decreases. If the rate is reduced by 50%, then Indonesia real GDP falls while Hong Kong's real GDP increases. The 50% tariff reduction in the AHKFTA cooperation scheme has caused Indonesia trade balance to be negative. Full

liberalization in the cooperation of the AHKFTA increases imports of all sectors in Indonesia and increases output in sectoral vegetable oil (vol), oil seeds (osd), wearing apparel (wap), textile (tex) and electronic equipment (ele).

Mahyuddin (2012) examined the impact of the ACFTA on ASEAN-5 economies (Indonesia, Malaysia, Philippines, Singapore and Thailand) and China. Simulation results show that trade liberalization affects public consumption, government spending, investment, trade balance, labor wages, capital and GDP leases of each country. ASEAN-5 countries experienced a greater increase in exports compared to China. Trade balance position between Indonesia and China is better than those of Malaysia, Philippines, Singapore and Thailand. Consumption of each country to increase which is driven by an increase in people's income. Based on simulations with GTAP, agricultural commodities dominate Indonesia output, exports and imports. In Indonesia, the percentage increase in output of agricultural commodities increased by 0.12% and non-agricultural commodities decreased by -0.01% while the increase in imports of agricultural commodities (3.11%) was higher than non-agricultural (1.36%).

The results obtained by Wibowo (2009) with GTAP version 6 show that the trade value of China is indeed better than ASEAN countries, but the trade value of Thailand, Malaysia and Singapore is better than Indonesia. The majority of ASEAN countries and China experienced an increase in investment as a result of trade cooperation. Through the scenario of eliminating import tariffs, real GDP and Indonesian welfare have increased. Indonesia exports increased by 2.96% while the increase in Indonesian exports was smaller than other ASEAN countries. Import commodities that dominate ASEAN are livestock, vegetables and fruits, while the increase in Chinese imports is dominated by agricultural, forestry and mining materials. The output of ASEAN countries has increased while China's output has decreased.

Methods

This research examines sectoral request-offers and all sectors of Indonesia and Taiwan using the 2-digit Harmonized System (HS-2017) code. Supporting data has been adjusted to the main data contained in the GTAP version 9 database. The analytical method used is inferencing, simulation and descriptive analysis.

Request-Offer Analysis of Indonesia and Taiwan: Index Revealed Comparative Advantage (RCA). The inferior analysis is used to validate commodities that are ranked as the main ranking scheme for Indonesia and Taiwan requests based on the results of the selection. The criteria used to select commodities in the request-offer scheme are the amount of import tariffs, annual growth in value from 2013-2017 (in%), share exports (in%) and high export value in 2017 (in thousand USD) of each country. After the selection, inferential analysis was carried out in order to get the appropriate sector to be recommended in the scheme of Indonesia request for Taiwan and Indonesia offer to Taiwan. The proxy used in inferential analysis is the Revealed Comparative Advantage/RCA index.

Observations on the average RCA and RCA trends during 2013-2017 are needed to obtain sectors that should be recommended as requests. The observation period for the last 5 years (2013-2017) can illustrate the actual development that is renewable so that it helps in formulating policies that are right on target. The actual conditions over the past 5 years can also be the basis for Indonesia in formulating effective strategies as a form of Indonesia proactive attitude in responding to ongoing cooperation with Taiwan. According to Mahyuddin (2012), comparative advantage is a theory developed to show that a country can benefit from trade. The comparative advantage or competitiveness of a country's exports on the global market can be represented by the RCA index first developed by Balassa. The RCA index is calculated with the following formula:

$$RCA = \frac{X_i/X_t}{W_i/W_t}$$

Information:

X_i = Indonesian export value for commodity i to Taiwan

X_t = total value of Indonesian exports to Taiwan

W_i = the value of world exports for commodities i to Taiwan

W_t = total value of world exports to Taiwan

Export competitiveness in sectoral Indonesian requests is categorized as high if it has a RCA index greater than 1. High sectoral competitiveness is indicated by comparative advantage that exceeds the world average. Export competitiveness in sectoral Indonesian requests is categorized as low if the RCA index is smaller than 1 or below the world average. The RCA index, the greater the value, indicates that the level of comparative advantage is higher.

Analysis of the Impact of Indonesia-Taiwan Bilateral Cooperation on Indonesian Macro and Sectoral Economics: Global Trade Analysis Project (GTAP)

Application. In addition to inferencing analysis, this study uses simulation analysis using GTAP version 9 with the Computable General Equilibrium (CGE) model. Percentage changes in the CGE model represent influences before and after policy simulation. All variables in the form of percentage changes or linear shapes are denoted by lowercase letters. Capital letters in mathematical equations are used to represent all sets, subset, parameters and nominal form variables. In GTAP version 9 there are input-output (IO) tables, production sector value added, primary input values and intermediate inputs, bilateral trade, transportation, protection, taxes and subsidies from 140 regions and 57 sectors. This research aggregates basic data into 3 regions and 57 sectors to be relevant to the research objectives. Regional aggregation to analyze the impact of reciprocal bilateral cooperation between Indonesia and Taiwan. Regional aggregation is needed to analyze the impact of cooperation on the economic performance of each region (Indonesia, Taiwan and Rest of the World). This research focuses on the performance of the Indonesian economy as a result

of cooperation with Taiwan in the fields of economy and trade. Aggregation results are adjusted to the research objectives to sharpen the focus of the study so that it is more specific and relevant to answer research problems (Tabel 1). In Table 2, all scenarios are simulated with the GTAP version 9 database.

III. RESULTS AND DISCUSSION

Impact of Cooperation on Indonesian Macroeconomics

Through a scheme of bilateral cooperation between Indonesia and Taiwan, each country experiences economic changes. Macroeconomic changes in each region (especially Indonesia) are shown in Table 3.

Welfare. The results of the analysis show that Indonesian welfare increased in all simulations. The findings are also in line with the research conducted by Elisabeth (2014). The highest welfare of Indonesia is obtained from simulation results 6 which reached 148.9356 million USD. The reduction in tariffs with the largest percentage of 95% which was also followed by a trade facility increase of 0.9% affected the increase in Indonesian welfare in a larger proportion. Welfare according to GTAP is calculated based on consumer surplus and producer surplus. From the consumer side, Salvatore (1997); Lee et al. (2014); Laksani and Salam (2016) revealed that the reduction in tariffs as an implication of trade liberalization can improve consumer welfare because the prices of goods received by consumers become cheaper. Kemendag (2015) reveals that the trade facility includes trade transactions, transparency and professionalism of customs and excise and regulatory environment as well as harmonization of standardization and is converted to international provisions or regional provisions. The more harmonious the standardization of products circulating in the market, the more it provides great benefits to consumers. Consumers are given great opportunities to obtain goods that have met standardization. Leland (1979) explained that

standardization of products consumed by the public can improve consumer welfare.

The scenario of decreasing import tariffs as well as increasing trade facilities can lead to trade creation. Wibowo (2009) defines trade creation as the implication of economic integration that can create trade among members that have never happened before. Through trade creation, member countries obtain products from production that is more efficient than other member countries. Products that are produced with a more efficient process can reduce the selling price of these products so that consumers get goods at lower prices. For producers, the scenario of a tariff reduction of 95% accompanied by an increase in trade facilities of 0.9% can maximize company profits. This is because the company's revenue allocation (income) is greater than the production costs incurred. Bilateral cooperation between Indonesia and Taiwan according to CoA (2016), also facilitates technology exchanges, market access and industry information. This clearly makes it easy for producers to get easier information with minimum costs so that production costs decrease. Based on the description above, a reduction in import tariffs and an increase in the trade facility can improve Indonesia welfare. From the producer side, the facility can improve welfare because it increases export opportunities for producers. For consumers, the scenario can maximize satisfaction (utility) because the allocation of income (income) is spent by consumers to obtain more and cheaper goods. This indicates that the increase in public welfare is indicated by the accumulation of consumer surplus and producer surplus as a result of cooperation between Indonesia and Taiwan in the fields of economy and trade.

Gross Domestic Product (GDP). Each simulation (SIM 1, SIM 2, SIM 3, SIM 4, SIM 5 and SIM 6) has an impact on the increase in Indonesian real GDP. The increase in Indonesia GDP as a result of cooperation with Taiwan was also found by LIPI (2012) and Elisabeth (2014). The highest increase in real GDP is obtained from simulation results 6,

namely 0.0112%. The increase was caused by a decrease in tariffs with the largest percentage, namely 95%, as well as an increase in the trade facility by 0.9%. According to Sorescu and Flaig (2017), the implementation of a trade facility has the potential to increase the GDP of a country whose percentage depends on the level of development of each country. Wilson et al. (2003) explained that the trade facility indicated an increase in efficiency in administration and procedures that was in line with the increase in port logistics and customs. Improvements in the trade facility led to increased productivity in production, distribution and consumption activities. This is because the travel time and duration needed during the activity are shorter and faster. Intuitively, cutting travel time and the shorter duration during the process of production, distribution and consumption can reduce inefficiencies. Increased efficiency as an implication of the increase in the trade facility can encourage an increase in GDP in terms of expenditure, namely consumption, investment, government spending and the trade balance.

Consumption. Based on the simulation results, simulation 6 has an impact on the increase in Indonesian consumption with the largest percentage of 0.0677%. This is caused by the implementation of the scenario of reducing tariffs in the largest percentage, which is 95% and followed by the scenario of a trade facility increase of 0.9%. Wibowo (2009) explained that consumption of private households follows the function of spending Constant Difference of Elasticity/CDE. According to Oktaviani and Puspitawati (2017), the preferences of private households are non-homothetic. This indicates that the non-homothetic CDE function is consistently able to explain changes in consumption as a result of changes in income levels. Referring to Romer (2012) regarding the traditional Keynesian consumption function, individual income is positively correlated with consumption. Based on BPS (2018), Indonesia GDP has increased its growth rate since 2001-2011. As in Figure 2, Indonesia GDP

growth rate in 2001 reached 3.64% while in 2011 it reached 6.49%. CGTA (2018) states that GTAP version 9 database uses reference data from 2004, 2007 and 2011. Thus, observing Indonesia GDP growth rate from 2001-2011 is considered relevant to be juxtaposed with GTAP version 9 simulation results.

Based on Figure 2, the trend of increased consumption in all simulations is also followed by a trend in GDP which tends to increase since 2001-2011. Indonesia increasing GDP growth indicates that the ability of public consumption to be driven up as a result of increasing public purchasing power. The increase in Indonesian consumption in all simulations is influenced by the reduction in import tariffs on Taiwan's export products. The biggest increase in consumption in simulation 6 is the impact of the reduction in tariffs with the largest percentage of 95% for all sectors while the impact of the increase in the trade facility is 0.9%. The reduction in tariffs has implications for the cheapness of Taiwan's export products for consumers in Indonesia, thereby increasing the purchasing power of the Indonesian people. According to Lipsey et al. (1995), the price and quantity of demand for a product has a negative relationship. This indicates that the cheaper the Taiwanese export products, the higher the number of Indonesian consumer demand for Taiwanese products, *ceteris paribus*. Indonesia increasing consumer demand for Taiwan's export products has caused Indonesia consumption to increase.

Investation. Based on the simulation results of GTAP version 9, simulation 6 provides the highest increase in investment for Indonesia, which is 0.096% and is an implication of a 95% tariff reduction and a trade facility increase of 0.9%. All simulations have an impact on the increase in investment in Indonesia. This indicates that the reduction in tariffs can encourage an increase in investment from partner countries. According to Gastanaga et al. (1998), the lower the tariff rates prevailing in a country, the foreign companies (investors) are increasingly

interested in building new companies in the country as a form of market expansion. Decreasing tariffs creates an increasingly conducive world trade climate. Improving the world trade climate can increase the confidence of producers and investors from partner countries to invest, buy shares and build projects in the country. This is also the case with the tariff reduction scenario which is also followed by the scenario of an increase in the trade facility. Both scenarios can increase investment in Indonesia. According to Kemendag (2015), trade facilitation is demonstrated by the existence of clarity, efficiency and transparency that reduces bureaucracy and corruption and relies more on technological progress. As an implication, improvements in the trade facility have pushed up productivity in Indonesia. The proxy used to simulate a trade facility is ams. The increase in the trade facility which has implications for productivity increases in Indonesia can increase investors' interest and preference for investing in the country. In line with the research conducted by Woo and Heo (2009); Lipsey and Sjöholm (2011), declining levels of corruption as part of a trade facility improvement can also increase the attractiveness of investors to invest in a country. There is a lot of research that looks at the role of investment in spurring economic growth in developing countries, one of which is done by Pham (2010). The findings are that FDI has an important role in spurring economic growth and global integration in Indonesia. Lipsey and Sjöholm (2011) also found the influence of FDI in Indonesia which led to increases in productivity, increased exports, rising wages, employment growth and positive spillovers.

Government Expenditures. All simulations caused an increase in Indonesian government spending. The biggest increase in government expenditure was obtained from simulation 6 reaching 0.0751%. The magnitude of the increase in Indonesian government expenditure on simulation 6 is caused by the implementation of the scenario of tariff reduction with the highest percentage of 95% and the increase

in the trade facility scenario by 0.9%. The greater the percentage of tariff reduction applied, the greater the increase in government spending. The trade facility implementation of 0.9% caused a tendency for government spending to increase. Wilson et al. (2003) found that the trade facility has an important role for the government in making decisions including in formulating policies. This indicates that the improved trade facilities between Indonesia and Taiwan have increasingly encouraged the Indonesian government to increase spending to advance national development. From 2015-2017, Indonesia national development focused more on strengthening the domestic sector which became Indonesia comparative advantage.

The target of the Indonesian government according to Bappenas (2018) is currently sustainable food sovereignty, energy and electricity sovereignty, maritime affairs and maritime affairs and industry and tourism. This target is used as economic power and the potential for strengthening inter-island connectivity. Development is carried out by prioritizing the role of marine economy and the synergy of national marine development (SKRI 2016). The government provides assistance and establishes regulations that support the optimization of Indonesia leading sectors as stated in the 2015-2019 Medium Term Development Plan (RPJMN). The 2015-2019 RPJMN is the third stage of the National Long Term Development Plan (RPJPN) 2005-2025 which has been established through Law Number 17 of 2007 (Bappenas 2018).

Realization of government assistance which is increasing every year has implications for the increase in Indonesian government spending which tends to increase. Trade liberalization is realized through the reduction or elimination of import tariffs between the countries involved. If Indonesia reduces import tariffs on Taiwan's export products, Taiwan products will be cheaper for the Indonesian government. This has implications for the depreciation of the Taiwan exchange rate (Taiwan's new dollar or TWD compared to the Indonesian

rupiah). According to Krugman and Obstfeld (2003) on Market Equilibrium Output in the Short Run, the depreciation of TWD against the Indonesian rupiah pushed up Taiwan's output. As an implication, Taiwan's exports increased to Indonesia because the Indonesian government tended to increase spending on imported products from Taiwan which were cheaper.

Balance of trade. In all simulations, Indonesia trade balance showed a decline. The biggest decrease was obtained from simulation 6 which reached -186.7489 million USD while the smallest decrease in the trade balance was obtained from simulation 1 which was -21.6415 million USD. These results have in common with the findings of Laksani and Salam (2016) who examined the impact of ASEAN and Hong Kong cooperation through a 50% tariff reduction and full liberalization. Indonesia trade balance from the findings is a deficit because the proportion of exports is smaller than imports. Referring to Gultom et al. (2018), Indonesia relies more on exports made from raw materials. This has implications for the added value obtained by Indonesia not as much as the added value obtained by other competitive countries. Most of Indonesia exports also still have low competitiveness. The impact of trade creation on trade liberalization creates a high dependence on imported products. Trade creation encourages consumers to prefer imported products because the import prices obtained by consumers are relatively cheaper. The flood of imported products in Indonesia has caused the local industry to experience market pressure so that it tends to be uncompetitive when facing an invasion of imported products. As an implication, Indonesia trade balance has a deficit because the proportion of imports is greater than exports. According to Laksani and Salam (2016), the central issue in Indonesia that needs to be observed is how much the strength of Indonesia export supply in responding to opportunities for trade liberalization. If Indonesia does not maximize the increase in productivity through production efficiency and utilization of technology, industries in Indonesia

cannot compete with foreign industries when facing trade liberalization. As an implication, the trade balance will continue to be deficit because export performance is not better than import performance.

Inflation. Simulation with GTAP version 9 shows that simulation 6 has an impact on the inflation increase with the highest percentage of 0.0541%. In all simulations (SIM 1, SIM 2, SIM 3, SIM 4, SIM5 and SIM 6) indicate an increase in inflation. The implementation of tariff reduction in each simulation causes import prices for Taiwanese products to be cheaper in Indonesia. As an implication, Indonesian domestic products compete with imported products from Taiwan. As found by Gultom et al. (2018), industries in Indonesia have not been able to create high added value in production activities. Production inefficiency in Indonesia causes the price of Indonesian products to be relatively expensive compared to imported products.

The flood of imported products at lower prices has caused the Indonesian people to have a better preference for imported products. As an implication, the public has expectations that prices of domestic goods will tend to be expensive compared to the prices of imported goods. The expectations of the community are getting stronger along with the development of cooperation schemes between Indonesia and Taiwan. The more rapid liberalization of trade between Indonesia, Taiwan and other trading partner countries (Rest of the World) will increasingly lead the public towards the superiority of imported products. According to Blanchard and Johnson (2012), high public expectations of the inflation rate at the selling price of an item will encourage an increase in actual inflation. This means that public expectations for inflation have a positive correlation with the real inflation rate. Intuitively, the perception of the Indonesian people towards increasingly expensive domestic products will push the real inflation rate to rise. Coupled with the flood of cheap imported products that enter Indonesia. From the demand side, the cheaper the price of an item will further increase people's demand for the

item. According to Lipsey et al. (1995), the price and quantity of demand for a commodity are negatively related. This means that the lower the price of a commodity, the higher the demand for the commodity, *ceteris paribus*. As an implication, Syahfdi et al. (2010) revealed that the lower the price of a product, the higher the export volume, and vice versa. This further encouraged Taiwan to continue to expand its export capacity to Indonesia. As an impact, the inflation rate in Indonesia is increasing.

Impact of Cooperation on Indonesia Sectoral Economy

Output. The scenario of decreasing import tariffs and increasing reciprocal trade facilities between Indonesia and Taiwan affects the output performance of each country. Gultom et al. (2018) states that Indonesia sectoral production value added is relatively low. As an implication, most of Indonesia output has decreased as a result of the cooperation scheme between Indonesia and Taiwan in the trade sector. Table 4 presents Indonesia sectors that experienced the largest increase in output.

Indonesian commodities in the request-offer scheme experienced the largest increase in output, namely ofd or nec food products and fsh or fishing commodities in all simulations. Commodities of tex or textiles experienced the largest increase in output reaching 0.1535% in simulation 4. This was due to the percentage reduction in rates in simulation 4 using an optimistic scenario. The percentage of tariff reduction in the optimistic scenario reaches 95%, the percentage value being the highest rate reduction. MoFA (2018) explained that Taiwan also invested in the Indonesian textile industry. As an implication, investment in the industry is driving up output. Lipsey and Sjöholm (2011); CoA (2016); Aditya (2018); Kemendag (2018) explains that investment can trigger industrial development in terms of production. There is one commodity in Indonesia request-offer scheme with Taiwan which has the biggest decrease in output in all simulations, namely crp or chemical, rubber, plastic products. Simulation 6 shows the biggest decrease in Indonesia output on

crp or chemical commodities, rubber, plastic products. The amount of output decrease in these commodities is -0.159%.

Exports. Commodity requests-offer from Indonesia and Taiwan which experienced an increase in exports were tex or textiles; v_f commodities or vegetables, fruits, nuts; fsh or fishing commodities and ofd or food products. Based on the simulation results of GTAP version 9, the largest increase in exports in simulations 1 and 2 occurred in tex commodities or textiles. The amount of this increase reached 0.834% and 1.844%. Textiles commodities or tex are one of the commodities included in Indonesia offer scheme to Taiwan. The increase in Indonesian exports was highest in tex or textiles commodities obtained from simulation results 6 and simulation 4. The magnitude of the increase in Indonesian exports of tex or textiles commodities in simulation 6 was 2.640% and simulation 4 was 2.368%.

Most of Indonesia exports have decreased, although still in a relatively small percentage. Commodities in Indonesia request-offer scheme with Taiwan did not experience a decline in exports in all simulations. The biggest decline in Indonesian exports occurred in wol or wool, silk worm cocoons; otn commodity or transport equipment nec; cmt or meat commodities: cattle, sheep, goats, horses; gdt or gas commodity manufacture and rmk or raw milk commodity.

Import. Of all simulations (SIM 1, SIM 2, SIM 3, SIM 4, SIM 5 and SIM 6), commodities that experienced the greatest increase in imports were tex or textiles and commodity crp or chemical, rubber, plastic products. Textile commodities or tex and cosmetic commodities (crp) are also included in Indonesia offer scheme to Taiwan. In the request-offer scenario (simulation 1 and simulation 2), commodity textiles experienced an increase in imports of 0.8443% and 2.0365%. In the scenario of the tariff reduction applied to all commodities, textiles also experienced the largest increase in imports. In simulations 3 and 4, the increase in textiles imports was 0.9187% and

2.1965%. Likewise, the increase in commodity imports of textiles in simulations 5 and 6 reached 1.0375% and 2.3821%. None of the commodities in Indonesia request-offer scheme to Taiwan experienced a decline in imports. In all simulations (SIM 1, SIM 2, SIM 3, SIM 4, SIM 5 and SIM 6), the decline in imports in the largest percentage occurred not in Indonesia commodity offer-offer schemes with Taiwan such as commodities wap or wearing apparel commodities and osd or oil seeds.

Employment Opportunity. Commodities in the request-offer scheme that experience the greatest increase in labor demand in all simulations are ofd or food products nec; fsh or fishing and tex or textiles. In simulations 1 and 2, only 3 of the 4 commodities included in the recommendation of Indonesia request to Taiwan experienced an increase in labor. These commodities are ofd or food products nec; fsh or fishing and v_f or vegetables, fruits, nuts. Likewise in simulations 3, 4, 5 and 6 for commodities recommended in Indonesia request scheme to Taiwan, only 2 of the 4 commodities experienced an increase in labor namely ofd or food products nec and fsh or fishing commodities.

Of all simulations (SIM 1, SIM 2, SIM 3, SIM 4, SIM 5 and SIM 6), the commodities that experienced the largest increase in unskilled labor and skilled labor were tex or textiles. The greatest increase in labor of tex or textiles commodities was obtained from simulation results 4, namely 0.143% for unskilled labor and 0.148% for skilled labor. This indicates that the increase in workforce in these commodities is more common in skilled labor or unskilled labor. The simulation results also have similarities with the research conducted by Elisabeth (2014). The findings indicate that tex or textiles commodities experienced an increase in demand for skilled and unskilled workers. The increase in skilled labor is also greater than the increase in unskilled labor in all simulations.

According to the MoFA (2018), Taiwan is investing in several Indonesian industries, such as furniture, textile, footwear, non-metal mining, metal, tire,

service trade, agriculture and so on. Based on the findings of Lipsey and Sjöholm (2011); Aditya (2018), the effect of these investments can drive the growth of employment in Indonesia. Intuitively, an increase in investment can encourage a company that receives an injection of funds and capital from investors to develop its production scale.

MoFA (2016) and Eurasia Review (2018) added that there were more than 2000 Taiwanese companies built in Indonesia. As an implication, the increasing number of these companies will increasingly require a larger workforce to carry out operational and production activities in Indonesia. Thus, the number of workers in sectors that receive capital injections from investors tends to increase.

In the GTAP model, labor is assumed to be unable to move between regions. The movement of labor only occurs between sectors in a region. If investment encourages the development of scale of production in tex commodities or textiles in Indonesia, then as a substitute for other commodities, the demand for labor will decrease. This is caused by the transfer of labor to commodities that require a greater amount of labor to spur the increase in the scale of production on the demand side.

Textiles commodities are included in the industry classification which has labor intensive production trends. The amount of labor needed is very much when the company wants to increase its output. Intuitively, the increase in commodity exports of textiles led to an increase in output for these commodities so that in order to achieve an increased scale of production, the amount of labor needed to achieve certain outputs also increased. On the demand side, this has led to an increase in labor demand.

Commodities in the request-offer scheme in Indonesia that experience the greatest decline in demand for labor are crp or chemical, rubber, plastic products. Most commodities in Indonesia experienced the greatest decline in unskilled labor. This indicates that the demand for skilled labor is greater than the number of unskilled workers. In line

with the findings of LIPI (2012); Elias (2013); Elisabeth (2015) who showed that bilateral relations between Indonesia and Taiwan became an opportunity for Indonesia to receive technology transfer from Taiwan. The utilization of technology transfer from Taiwan can be maximally absorbed by a skilled workforce. Skilled labor has the ability, expertise and competence that is sufficient to utilize advanced technology. As an implication, the company reduces the demand for unskilled labor so that its allocation is transferred to skilled labor.

Conclusion

From the results of inferential analysis, the commodities included in the scheme requesting Indonesia to Taiwan are processed foods (ofd); tobacco (b_t); vegetables, fruits and nuts (v_f) and fishery commodities (fsh) while commodities included in Indonesia offer scheme to Taiwan are manufacturing (lum); cosmetics (crp); miscellaneous edible preparations (ofd) and textiles (tex).

Based on the results of the simulation analysis, cooperation in the economic field and trade between Indonesia and Taiwan had a positive impact on most sectoral economies and Indonesia macro economy. From a sectoral economic perspective, most exports, outputs, imports and employment opportunities in Indonesia have increased. In terms of macroeconomics, cooperation with Taiwan caused an increase in the level of welfare, GDP, consumption, investment, government spending and inflation in Indonesia. The increase in GDP is transmitted from an increase in consumption, investment and government spending after the import tariff was reduced reciprocally.

Through cooperation with Taiwan, Indonesia trade balance has not shown good performance so that Indonesia needs to take strategic steps to improve the performance of Indonesia trade balance in the future. The tariff reduction of 95% for all commodities and an increase in the trade facility of 0.9% in simulation 6 provides the greatest benefits to Indonesia sectoral and macro economy. The increase in the trade facility by 0.9% was transmitted from increased

productivity and efficiency in the trade sector. As an implication, the level of welfare, real GDP, household/private consumption, investment, government expenditure and inflation in Indonesia increased in the highest percentage, even though Indonesia trade balance experienced the biggest deficit of -186,7489 million USD. The trade balance deficit based on simulation 6 can be corrected with some policy recommendations and recommendations. Text or textiles commodities in all simulations experienced the largest increase in exports, output, imports and labor demand. Overall, the demand for skilled labor has increased more than the demand for unskilled labor.

The rapid development of Indonesia cooperation with Taiwan needs to be anticipated by Indonesia. Indonesia can continue cooperation with Taiwan while making improvements and preparing strategic steps. This is so that Indonesia can obtain greater benefits from the cooperation that is established by continuing to prioritize national interests.

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Tables and Figures

Table 1. Region aggregation

No	Research Region	Code	Region in GTAP version 9
1	Indonesia	IND	Indonesia
2	Taiwan	TWN	Taiwan Australia; New Zealand; Rest of Oceania; China; Hong Kong; Japan; Korea; Mongolia; Rest of East Asia; Brunei Darassalam; Cambodia; Lao People's Democratic Republ; Malaysia; Philippines; Singapore; Thailand; Viet Nam; Rest of Southeast Asia; Bangladesh; India; Nepal; Pakistan; Sri Lanka; Rest of South Asia; Canada; United States of America; Mexico; Rest of North America; Argentina; Bolivia; Brazil; Chile; Colombia; Ecuador; Paraguay; Peru; Uruguay;
3	Rest of the World	RoW	Venezuela; Rest of South America; Costa Rica; Guatemala; Honduras; Nicaragua; Panama; El Salvador; Rest of Central America; Caribbean; Austria; Belgium; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Ireland; Italy; Latvia; Lithuania; Luxembourg; Malta; Netherlands; Poland; Portugal; Slovakia; Slovenia; Spain; United Kingdom; Switzerland; Croatia; Romania; Russian Federation; Ukraine; Rest of Eastern Europe; Rest of Europe; Georgia; Israel; Jordhan; Rest of the World.

Tabel 2. Simulation Classification in Cooperation between Indonesia and Taiwan

Simulation	Percentage	Scenario	Sectoral	Region
1	(-) 50 %	Tariff (tms)	Request-offer sectoral	
2	(-) 95 %	Tariff (tms)	Request-offer sectoral	
3	(-) 50 %	Tariff (tms)	All Sectoral	Indonesia
4	(-) 95 %	Tariff (tms)	All Sectoral	and
5	(-) 50 % (+) 0.9 %	Tariff (tms) Trade Facility (ams)	All Sectoral	Taiwan
6	(-) 95 % (+) 0.9 %	Tariff (tms) Trade Facility (ams)	All Sectoral	reciprocally

Table 3. Simulation Results in Indonesian Macroeconomics

Macro Indicator	SIM 1	SIM 2	SIM 3	SIM 4	SIM 5	SIM 6
Welfare (million USD)	12.8689	8.9427	41.9669	58.2729	132.1508	148.9356
Real GDP	0.002561	0.003404	0.003824	0.00493	0.010057	0.011213
Investation (%)	0.0094	0.0193	0.0341	0.0699	0.0584	0.0960
Government Expenditures (%)	0.0064	0.0106	0.0224	0.0410	0.0558	0.0751
Trade Balance (million USD)	-21.6415	-48.7447	-68.6756	-147.641	-103.565	-186.7489
Inflation (%)	0.0030	0.0061	0.0155	0.0306	0.0385	0.0541

SIM 1 = Decrease in tariffs by 50% in the request-offer sector
 SIM 2 = Decrease in tariffs by 95 % in the request-offer sector
 SIM 3 = Decrease in tariffs by 50% in all sector

SIM 4 = Decrease in tariffs by 95 % in all sector

SIM 5 = Decrease in tariffs by 50% in all sectorand increase in trade facility by 0.9%

SIM 6 = Decrease in tariffs by 95 % in all sectorand increase in trade facility by 0.9%

Source: GTAP version 9 database, processed

Table 4. Indonesia Ten Sectors Experiencing the Biggest Output Increase in the Indonesia and Taiwan Cooperation Scheme (in%)

Sector	SIM 1	Sector	SIM 2	Sector	SIM 3	Sector	SIM 4	Sector	SIM 5	Sector	SIM 6
wap	0.3142	wap	0.6926	wap	0.2552	wap	0.5764	wap	0.2430	wap	0.5815
ofd	0.0542	ofd	0.1329	mvh	0.0888	mvh	0.1981	nmm	0.0858	mvh	0.1958
fsh	0.0289	fsh	0.0646	nmm	0.0696	tex	0.1535	mvh	0.0820	nmm	0.1681
ele	0.0281	ele	0.0603	tex	0.0687	nmm	0.1485	ele	0.0563	tex	0.1445
tex	0.0124	tex	0.0293	ofd	0.0472	ofd	0.1187	cns	0.0550	ofd	0.1163
v_f	0.0120	v_f	0.0269	ele	0.0386	ele	0.0817	tex	0.0534	ele	0.1029
cns	0.0088	cns	0.0180	cns	0.0321	cns	0.0657	ofd	0.0433	cns	0.0903
fmp	0.0071	fmp	0.0144	fsh	0.0269	fsh	0.0601	lum	0.0409	fsh	0.0625
nmm	0.0048	i_s	0.0098	lum	0.0253	lum	0.0459	fsh	0.0289	lum	0.0621
i_s	0.0048	nmm	0.0096	v_f	0.0109	lea	0.0281	frs	0.0154	v_f	0.0273

SIM 1 = Decrease in tariffs by 50% in the request-offer sector

SIM 2 = Decrease in tariffs by 95 % in the request-offer sector

SIM 3 = Decrease in tariffs by 50% in all sector

SIM 4 = Decrease in tariffs by 95 % in all sector

SIM 5 = Decrease in tariffs by 50% in all sectorand increase in trade facility by 0.9%

SIM 6 = Decrease in tariffs by 95 % in all sectorand increase in trade facility by 0.9%

Source: GTAP version 9 database, processed

Table 5. Indonesia Ten Sectors Experiencing the Largest Reduction in Output in the Cooperation Scheme between Indonesia and Taiwan (in%)

Sector	SIM 1	Sector	SIM 2	Sector	SIM 3	Sector	SIM 4	Sector	SIM 5	Sector	SIM 6
crp	-0.055	crp	-0.114	i_s	-0.138	i_s	-0.283	i_s	-0.163	i_s	-0.314
nfm	-0.030	nfm	-0.062	nfm	-0.093	nfm	-0.191	vol	-0.134	vol	-0.215
vol	-0.028	vol	-0.060	vol	-0.073	vol	-0.151	crp	-0.089	crp	-0.159
gdt	-0.022	gdt	-0.045	crp	-0.062	crp	-0.129	otn	-0.080	nfm	-0.148
osd	-0.013	osd	-0.026	otn	-0.046	otn	-0.097	osd	-0.072	otn	-0.134
ocr	-0.012	ocr	-0.026	osd	-0.036	omf	-0.077	ome	-0.064	osd	-0.111
lum	-0.011	lum	-0.024	gdt	-0.036	gdt	-0.074	wht	-0.064	omf	-0.104
omn	-0.010	otn	-0.021	ppp	-0.032	osd	-0.073	lea	-0.061	gdt	-0.092
otn	-0.009	omn	-0.020	omf	-0.032	ppp	-0.067	omf	-0.057	wht	-0.091
ppp	-0.007	ppp	-0.016	wht	-0.029	wht	-0.055	gdt	-0.052	ome	-0.072

SIM 1 = Decrease in tariffs by 50% in the request-offer sector

SIM 2 = Decrease in tariffs by 95 % in the request-offer sector

SIM 3 = Decrease in tariffs by 50% in all sector

SIM 4 = Decrease in tariffs by 95 % in all sector

SIM 5 = Decrease in tariffs by 50% in all sectorand increase in trade facility by 0.9%

SIM 6 = Decrease in tariffs by 95 % in all sectorand increase in trade facility by 0.9%

Source: GTAP version 9 database, processed

Figure 1. Indonesia exports to the main destination countries in 2017

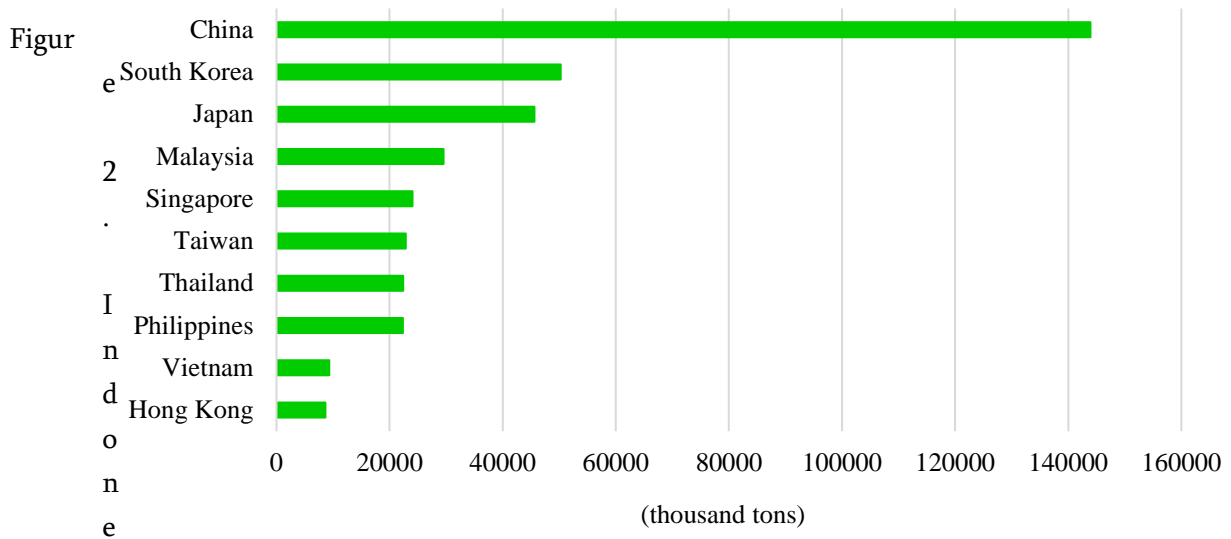


Figure 2. Indonesia GDP Growth Rate since 2001-2011 (in%)



Cite this article as :

Betrix Silitonga, Wiwiek Rindayati, Widyastutik, "Impact of Indonesia-Taiwan Bilateral Cooperation on Indonesia Economy", Gyanshauryam, International Scientific Refereed Research Journal (GISRRJ), ISSN : 2582-0095, Volume 2 Issue 6, pp. 01-18, November-December 2019. URL : <http://gisrrj.com/GISRRJ19262>