# THE IMPACT OF TARIFF REDUCTIONS IN TAIWAN AND INDONESIA'S REQUEST-OFFER SCHEMES ON INDONESIA'S SECTORAL ECONOMY: GTAP SIMULATION VERSION 9

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## ABSTRACT

*Introduction*: The trade field between Indonesia and Taiwan, namely cooperation under product tariffs, is increasingly expanding across various sectors.

**Methods:** This study analyzes the impact of Taiwan's and Indonesia's request-offer schemes on Indonesia's sectoral economic performance, including exports, imports, outputs, and employment opportunities, using GTAP Simulation Version 9.

**Results:** In the GTAP simulation version 9, textiles experienced the largest increases in exports and imports, while non-food products experienced the most significant increase in output. Food products, fishing, and textiles experienced the largest increases in labour demand.

**Conclusion and Suggestion:** Most of Indonesia's bilateral economic and trade cooperation with Taiwan has had a positive influence on Indonesia's sectoral economy. Through their respective roles, including those of the government, stakeholders, companies, investors, and business actors, they can help accelerate Indonesia's sectoral economic growth in the future while maintaining national interests. It is necessary to improve the quality of Indonesia's exports and output through improving the quality of domestic products and empowering Indonesian workers in Taiwan to be more skilled and understand their rights and obligations, as well as providing optimal assistance to strengthen human rights for all Indonesian workers.

## INTRODUCTION

The Indonesian Taipei Trade and Economic Office or KDEI Taipei (2021) explained that Indonesia and Taiwan continue to pursue good bilateral cooperation to spur Indonesia's economic growth, one of which is realised through the implementation of the Indonesia-Taiwan Industrial Collaboration Forum (ITICF). Indonesia is Taiwan's main partner in the Southeast Asian region to realise industrial capacity building and economic cooperation, whose

opportunities need to be maximised according to Aditya (2018), KDEI Taipei (2021), and Fadillah *et al* (2024). Lee *et al* (2014) and Kruppa (2016) explain that trade liberalisation is accompanied by a reduction in import tariffs, the elimination of import tariffs, and the minimisation of other trade barriers to each partner country.

Based on the International Trade Centre or ITC (2019), since 2001-2017, Indonesia's exports to Taiwan, Asia and the world have shown an increase (Figure 1). Total trade between Taiwan and Indonesia in 2017 amounted to 5.29 billion USD, while Indonesia's exports to Taiwan grew by 13.31 % as explained by the Ministry of Trade (2017). Taiwan is a potential market for Indonesian producers because of the tendency to increase exports from Indonesia to Taiwan.



Figure 1. Indonesia's total exports to Taiwan, Asia, and the World
Source: ITC (2019), processed

Betrix *et al* (2019) examined that the Global Trade Analysis Project (GTAP) database version 9 shows that the tariffs on imported products imposed by the state of Taiwan on products exported by Indonesia and the tariffs imposed on Taiwanese export products by Indonesia are relatively large. The high import tariffs of the two countries can be negotiated through bilateral cooperation schemes in order to create cooperation that provides benefits. This can be achieved through tariff reductions that have relatively high tariff levels. Cooperation between Indonesia and Taiwan extends to various fields based on the findings of Aditya (2018), Eurasia Review (2018), Bo-jiun (2018), Hsiao and Yang (2018), Chong (2018), and MoFA (2018). The signing of two memorandums of understanding or MoUs between 3 Taiwanese entrepreneurs and 1 Indonesian entrepreneur, with an investment of 15 trillion rupiah, shows that the downstream of various commodity industries is encouraged to be better. Based on Betrix *et al* (2019), the cooperation scheme between Taiwan and Indonesia is both a challenge and an opportunity for Indonesia.

Cooperation between Indonesia and Taiwan also includes the placement and protection of Indonesian migrant workers, who can support the economy of Indonesia through their contributions of migrant workers to the country's foreign exchange. Fadillah *et al* (2024) found that Taiwan proposed a New Southbound Policy/NSP in 2016, which had an impact on Indonesia's labour cooperation with Taiwan. According to Ndarujati (2021) and Fadillah *et al* (2024), Taiwan is the destination country for Indonesian migrant workers, with an increasing number every year.

Gultom *et al* (2018) examined several trade agreements that have been signed; Indonesia has not made the best use of them. Initiatives to encourage increased bilateral cooperation between Taiwan and Indonesia through various MoUs and investments by entrepreneurs raise questions in this study. Indonesia can maximise the potential and opportunities for bilateral cooperation to improve the welfare state, increase Indonesia's economic growth,

increase the capacity of Indonesia's sovereign state, and spur the growth of Indonesia's sectoral economic performance (Betrix *et al,* 2019).

The purpose of the study is to analyze the impact of bilateral economic cooperation between Taiwan and Indonesia through a request-offer scheme on Indonesia's sectoral economic performance, which includes: exports, imports, employment opportunities, and outputs. The focus of the research is Taiwan and Indonesia cooperation in the field of economic trade in a request-offer scheme which is determined based on the amount of annual value growth (%), high equivalent ad valorem rate (%), average export value (thousands of USD), size of export share between Indonesia and Taiwan (%), average Revealed Comparative Advantage index (RCA), and RCA trends using the 2-digit Harmonization System code (HS-2017). The top-ranked commodities are recommended in the Taiwan and Indonesia request-offer schemes on a reciprocal basis.

The request-offer scheme of Taiwan with Indonesia was analysed on the performance of Indonesia's sectoral economy in this study using GTAP version 9. The GTAP model, according to Oktaviani and Puspitawati (2017), is a Computable General Equilibrium (CGE) model in which the scope of international trade includes microeconomic and macroeconomic aspects of each country. The GTAP model has mathematical equations that describe each of the model variables that are formed, as well as a database that is consistently detailed in the equations of the model. In the CGE and GTAP models, there are basic concepts of expenditure and purchasing flows between economic actors. The CGE and GTAP models were formed based on microeconomic theory by detailing the behaviour of each economic actor.

## LITERATURE REVIEW

### Globalization

Purba *et al* (2021) explained that the service, industry, employment, income, and living standards related to efficient trade partners are realised by the mobility of goods and services, finance, and technology. An indication of globalisation is the process of dependence between countries and their citizens that occurs through trade, investment, and migration. Developed countries have a production factor with capital abundance, while developing countries have a production factor with labour abundance according to the Heckscher-Ohlin Theory. International trade that has a positive impact on each country is due to the specialisation of developed and developing countries, according to Betrix *et al* (2019).

The main determinant of international trade is the difference in the prices of various factors of production between countries based on the Heckscher-Ohlin Theory (H-O). Trade patterns are based on differences in the prices of goods and services between countries, specifically caused by differences in the proportion of the use of production factors (Purba *et al,* 2021). The H-O theory explains that the occurrence of trade with other countries is caused by comparative advantages that include the use of production factors and technology. Comparative advantages are based on the ownership factors of various factors of production of a country (endowment factor) and the use of technology in the production process (intensity factor). The modern Heckscher-Ohlin theory has 2 curves, including:
1. Isocost curve: a curve that represents the total cost of production equality.
2. Isoquant curve: a curve that represents the total similarity of the quantity of the product.

### Tariff

The Ministry of Trade of the Republic of Indonesia (2016) explained that tariffs are divided into import tariffs or import duties, Most Favoured Nation (MFN) tariffs/World Trade Organisation (WTO) tariffs, and preferential tariffs. Import tariffs are tariffs that the state imposes on goods that enter the customs territory based on the provisions of the law. Most Favoured Nation (MFN) tariff / World Trade Organisation (WTO) tariff applies generally to each WTO member country. Preferential tariff is a reduction or exemption of import duties based on bilateral or multilateral international agreements or agreements.

The Indonesian Information Portal (2019) stated that Indonesia and a number of countries carry out trade cooperation by enforcing the Free Trade Agreement (FTA) Preferential Tariffs. FTA has implications for decreasing production costs, thereby increasing the competitiveness of the industry. Preferential tariffs can be imposed on

imported goods to be used from bonded stockpiles (TPB) and have been approved, imported goods at the time of entry of goods into an approved bonded logistics centre (PLB), and the release of goods produced from the Free Zone to other places within the customs area (TLDDP). The application of preferential tariffs is imposed on raw materials and/or auxiliary materials from outside the customs area, and when the entry of goods into the free zone has been approved to use the preferential tariff, and is carried out by entrepreneurs in the free zone who have met the requirements. Preferential tariffs can be given to individual importers or legal entities, TPB operators/entrepreneurs, PLB operators/entrepreneurs, or entrepreneurs in free zones.

Minister of Finance Regulation (PMK) Number 39/PMK.010/2022 concerning the determination of export goods subject to export duties and export duty rates, as explained by the Agency for the Development and Development of State Financial Audit Law at the Financial Audit Agency (2022). The calculation of export duties is as follows:

1.      If the export duty rate is determined based on a percentage of the export price (ad valorem), the export duty is calculated based on the following formula:

$$Export\ Duty\ =\ Export\ Duty\ Rate\ \times Number\ of\ Units\ of\ Goods\ \times Export\ Price\ per\ Unit\ of\ Goods\ \times Currency\ Exchange\ Rate$$

2.      If the export duty rate is specifically determined, the export duty is calculated based on the following formula:

$$Export\ Duty\ =\ Export\ Duty\ Rate\ per\ Unit\ of\ Goods\ in\ a\ given\ Unit\ of\ Currency \times Number\ of\ Unit\ Goods \times Currency\ Exchange\ Rate$$

Export duty is a state levy based on the Customs Law imposed on export goods. The export benchmark price (HPE) is the benchmark price set periodically by the minister who carries out the duties and functions of the government that coordinates the field with the trade minister/head after the non-ministerial government agency/head of the relevant technical agency. The export price is the price used for the calculation of export duties. Reference prices are the international average price and/or average prices of certain commodity exchanges in the country for the determination of export duty rates determined periodically by the minister who carries out government duties and functions in the field of trade after coordinating with the minister/head of non-ministerial government agencies/heads of related technical agencies. Export prices are set by the Director General of Customs and Excise on behalf of the Minister of Finance according to the Export Benchmark Price (HPE).

## RESEARCH METHODS

### Data Sources and Types

The commodities in the Taiwan and Indonesian request-offer schemes in this study use the 2-digit code Harmonised System (HS-2017), whose supporting data is first adjusted to the GTAP database version 9. This research uses supporting data from various sources, namely: International Trade Centre (ITC), Ministry of Trade of the Republic of Indonesia, Ministry of Foreign Affairs of Taiwan, and others.

### Analysis Method

To validate commodities in the Taiwan and Indonesia request-offer schemes is based on several criteria, including: annual value growth (%), share exports (%), import tariffs, export value (thousand USD), and the RCA index of each country, namely Indonesia and Taiwan. The RCA Index can represent the comparative advantage or export competitiveness of a particular country in the global market. Balassa first developed the calculation of the RCA index as follows:

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

*Xi* is the export value to Taiwan for Indonesian commodities, while *Xt* is the total value of exports to Taiwan from Indonesia. *Wi* is the value of world exports to Taiwan for commodity *i*, whereas *Wt* is the total value of exports to Taiwan from the world. If the commodities in the Taiwan and Indonesia request-offer schemes have an RCA index higher than 1, then their competitiveness is very high because their comparative advantage is high, while the commodities in the Taiwan and Indonesia request-offer schemes have an RCA index of less than 1, then their competitiveness is relatively low because of their low level of comparative advantage.

**Analysis of Taiwan and Indonesia's Request-Offer Schemes on Indonesia's Sectoral Economy: Simulation of GTAP Version 9 Database**

The Taiwan and Indonesia request-offer schemes have an impact on the sectoral economy in Indonesia, which includes: exports, imports, output, and job opportunities. The change in the trade balance in the GTAP is the difference between exports at Free on Board (FoB) prices and imports by including insurance costs, shipping costs, and shipping on related commodities in the region. The calculation of the change in the value of imports and exports (in percentages) according to the GTAP is:

$$VXW\ (i,r) * vxwfob\ (i,r) = \sum seREG\ VXWD\ (i,r,s) * [qxs\ (i,r,s) + pfob\ (i,r,s)] + VST\ (i,r) * [qst(i,r) + pm(i,r)]$$

*QXS (i,r)* is the amount of commodities exported from the region *r*. The value of the sale of commodities *i* from the region *r* to the international level transportation sector is recorded as *VST (i,r)*. In GTAP, the mathematical equation of job opportunities is the number of demand *i* from sector *j* in the region *r (qfe)*. *QVA (j,r)* recorded the index of the main input additional quantity in sector *j* and region *r*. *σVA (j)* is the elasticity of value-added substitution, and the value-added price in sector *j* of the region *r* is denoted as *PVA(j,r),* which is formulated as follows:

$$qfe\ (i,j,r) = qva\ (j,r) - \sigma VA\ (j) * [pfe\ (i,j,r) - afe\ (i,j,r) - pva\ (j,r)] - afe\ (i,j,r)$$

There are two (2) simulations through the GTAP database version 9 in this study, including: the 1st simulation is to reduce tariffs by 50 % for Taiwan and Indonesia reciprocally on commodities in the request-offer scheme, while the 2nd simulation is to reduce tariffs by 95 % for Indonesia and Taiwan reciprocally in the request-offer scheme.

**RESULT AND ANALYSIS**

**Taiwan and Indonesia Trade Performance**

ITC (2019) shows that Indonesia's total imports from Taiwan in 2017 reached 3.059 billion USD, while Taiwan's total imports from Indonesia amounted to 4.905 billion USD. The increase in the population of Taiwan and Indonesia was followed by an increase in imports from each country. Salvatore (1997) stated that in terms of demand, the population growth of a country can encourage an increase in domestic demand.

Based on ITC (2019), exports to Taiwan from Indonesia over the past 10 years tend to increase, and Taiwan's exports to Indonesia also tend to increase. The increase in the population of Indonesia and Taiwan is also followed by an increasing export trend from each country. Increased population growth in Indonesia and Taiwan was followed by increased exports in each country.

Table 1. Current Account Balance (million USD)

| Country | Export Value | Import Value | Total Value |
|---|---|---|---|
| Indonesia | 206.827,6 | -199.589,4531 | 7.238,125 |
| Taiwan | 370.214 | -293.438,2813 | 76.775,69 |
| Rest of the World | 19.576.894 | -19.660.908 | -84.014 |

Source: GTAP version 9 database, *processed*

Based on the GTAP version 9 database, Taiwan and Indonesia have a surplus of current account balances. The import value of Taiwan and Indonesia is smaller than the export value of each of these countries, as researched by Betrix *et al* (2019) and based on GTAP version 9 of the database, as shown in Table 1. According to Bank Indonesia (2017), Indonesia's current account deficit at the end of 2016 is improving. Some of the factors that support the improvement are:

1) There is an evaluation and follow-up of the performance of primary income and the balance of trade in goods as an implication of increasing exports to trading partner countries;
2) Rising global commodity prices;
3) The primary income balance deficit decreased in line with the decrease in the time period for bond interest payments from the government; and
4) There is an increase in the world economy.

Based on Bank Indonesia (2018), Indonesia's current account deficit at the end of 2017 is getting worse. The declining trade balance surplus in the gas and non-oil sector and the soaring trade balance deficit in the gas, oil, and services sector are indicated to be the contributing factors. Similarly, Indonesia's current account deficit in 2018 also showed a deteriorating performance. Bank Indonesia (2019) reported that the factors affecting these conditions were the increasing domestic demand for imported goods, while export performance was still limited and the decline in trade balance performance in the non-oil and gas sector.

Commodity recommendations in the Taiwan and Indonesia request-offer schemes. Taiwan and Indonesia's trade cooperation provides an opportunity for Indonesia to increase its export performance. This is in line with what Aditya (2018) said. According to Betrix *et al* (2019), Indonesia needs to apply for a tariff reduction from the results on Indonesian commodity recommendations that are included in the category of a list of requests and offers to be submitted to Taiwan as a form of Indonesian request and vice versa.

Balanced and proportionate cooperation requires reciprocal action from both countries involved in reciprocal cooperation. If Indonesia proposes a tariff reduction for 4 commodities of the request-offer scheme, in return, the trading partner, namely Taiwan, can also receive a tariff reduction from Indonesia for the 4 commodities in the request-offer scheme.

Products contained in Taiwan's request scheme from Indonesia are classified as commodities in GTAP version 9. The classification is applied by taking into account the dominant product groups, then grouped into the GTAP version 9 database. To minimise the risk of commodity classification, the classification refers to the product nomenclature and HS 2017 concordances in accordance with the GTAP database obtained from the World Integrated Trade Solution or WITS (2019). Based on ITC (2019), all products included in Indonesia's request scheme to Taiwan have also experienced an increase in export growth since 2013-2017.

According to MoFA (2016) and Marston and Bush (2018), Taiwan and Indonesia build performance that mutually benefits each other in the development of the fisheries and agriculture sectors. Indonesia can use cooperation contracts to prioritise national interests. Indonesia also has great potential in the export of agricultural products. According to MoFA (2018), Indonesia has become a comprehensive agricultural pilot area with good agricultural management techniques. Taiwan offers Indonesia superior agricultural machinery, fertiliser, and seed facilities in response to the development of bilateral cooperation between Taiwan and Indonesia.

CoA (2016) explained that the agricultural cooperation agreement between Taiwan and Indonesia is built on the principles of equality and reciprocity. Thus, Indonesia can negotiate with Taiwan to lower import tariffs on Indonesia's agricultural export products, especially on products included in (04) *v_f* or vegetables, fruit, nuts and (25) *ofd* or food products nec contained in the GTAP version 9 database. This can be used as Indonesia's response to Taiwan in taking advantage of mutually beneficial cooperation opportunities. Based on Table 2, Indonesia proposes 4 sectors to Taiwan according to the ranking with the highest export criteria.

Table 2. Indonesia's Sectoral Recommendations Based on Export Performance

| HS | Commodities | Concordance GTAP | Annual growth 2013-2017 (%) | Mean export 2013-2017 (thousand USD) | Export 2017 (thousand USD) | Share export (%) |
|---|---|---|---|---|---|---|
| 9 | Preparations of cereals, flour, starch or milk; pastrycooks' products | (25) ofd/food products nec | 8 | 19.081,2 | 26.550 | 3 |
| 4 | Tobacco and manufactured tobacco substitutes | (26) b_t/beverages and tobacco products | 75 | 7.090 | 13.598 | 1 |
| 6 | Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates | (25) ofd/food products nec | 18 | 3.179,2 | 3.887 | 0 |
| | Edible vegetables and certain roots and tubers | (04) v_f/vegetables, fruit, nuts (25) ofd/food products nec | 14 | 13.860,4 | 15.392 | 15 |
| | Fish and crustaceans, molluscs and other aquatic invertebrates | (14) fsh/fishing (25) ofd/food products nec | 12 | 80.409 | 102.639 | 3 |

Source: GTAP version 9 database and ITC (2019), *processed*

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Table 3. Indonesia's Sectoral Recommendations Based on Tariffs and Competitiveness

| HS | Commodities | Concordance GTAP | Tariff (%) | RCA | | | | | Mean RCA |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 2013 | 2014 | 2015 | 2016 | 2017 | |
| 19 | Preparations of cereals, flour, starch or milk; pastrycooks' products | (25) ofd/food products nec | 25 | 0,83 | 0,68 | 0,7 | 0,82 | 1,09 | 0,825 |
| 24 | Tobacco and manufactured tobacco substitutes | (26) b_t/beverages and tobacco products | 22 | 0,06 | 0,07 | 0,12 | 0,53 | 0,48 | 0,251 |
| 16 | Preparations of meat, of fish or | (25) ofd/food products nec | 21 | 0,03 | 0,18 | 0,04 | 0,1 | 0,17 | 0,102 |

| | Commodities | Concordance | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | of crustaceans, molluscs or other aquatic invertebrates | | | | | | | | |
| 7 | Edible vegetables and certain roots and tubers | (04)v_f/vegetables, fruit, nuts (25) ofd/food products nec | 19 | 3,35 | 2,21 | 3,1 | 8,35 | 5,9 | 4,581 |
| 3 | Fish and crustaceans, molluscs and other aquatic invertebrates | (14) fsh/fishing (25) ofd/food products nec | 18 | 0,71 | 0,61 | 0,86 | 1,2 | 1,26 | 0,927 |

Source: GTAP version 9 database and ITC (2019), *processed*

Table 4 presents Taiwan's sectoral in Indonesia's offer scheme based on Taiwan's export performance in Indonesia. Four commodities ranked first, including (HS 46) manufactures of straw, of esparto or of other plaiting materials; basketware and wickerwork; (HS 33) essential oils and resinoids; perfumery, cosmetic or toilet preparations; (HS 21) miscellaneous edible preparations and (HS 63) other made-up textile articles; sets; worn clothing and worn textile articles; rags. In addition to having export achievements with the main ranking, the 4 commodities also have competitiveness and high tariff levels in Indonesia, according to the results of research from Betrix *et al* (2019).

Table 4. Taiwan's Sectoral Recommendations Based on Export Performance

| HS | Commodities | Concordance GTAP | Annual growth 2013-2017 (%) | Mean export 2013-2017 (thousand USD) | Export 2017 (thousand USD) | Share export (%) |
|---|---|---|---|---|---|---|
| 46 | Manufactures of straw, of esparto or of other plaiting materials; basketware and wickerwork | (30) lum/wood products | 38 | 68,2 | 102 | 1 |
| 33 | Essential oils and resinoids; perfumery, cosmetic or toilet preparations | (33) crp/chemical, rubber, plastic products | 21 | 8.201 | 11.803 | 1 |
| 21 | Miscellaneous edible preparations | (25) ofd/food products nec | 8 | 12.847,8 | 15.529 | 2 |
| 63 | Other made-up textile articles; sets; worn clothing and worn textile articles; rags | (27) tex/textiles | 6 | 6.207,8 | 7.269 | 2 |

Source: GTAP version 9 *database* and ITC (2019), *processed*

Based on research conducted by Betrix *et al* (2019), in addition to having export performance with the main ranking, the 4 commodities also have high competitiveness and tariffs in Indonesia. Referring to Table 5, the commodities that have the highest average RCA are (HS 21) miscellaneous edible preparations and (HS 63) other made-up textile articles; sets; worn clothing and worn textile articles; rags. The four sectors included in Indonesia's

offer scheme to Taiwan also have a tendency to increase competitiveness, which tends to increase every year, according to Betrix *et al* (2019). The sectors that have the highest competitiveness growth are (HS 33) essential oils and resinoids; perfumery, cosmetic or toilet preparations and (HS 21) miscellaneous edible preparations.

Table 5. Taiwan's Sectoral Recommendations Based on Competitiveness and Tariff Levels

| HS | Commodities | Concordance GTAP | Tariff (%) | RCA | | | | | Mean RCA |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 2013 | 2014 | 2015 | 2016 | 2017 | |
| 46 | Manufactures of straw, of esparto/of other plaiting materials;basketware and wickerwork | (30)lum/wood products | 25 | 0,218 | 0,292 | 0,693 | 0,791 | 0,767 | 0,552 |
| 33 | Essential oils and resinoids; perfumery, cosmetic or toilet preparations | (33)crp/chemical, rubber, plastic products | 20 | 0,517 | 0,882 | 1,224 | 1,190 | 1,406 | 1,044 |
| 21 | Miscellaneous edible preparations | (25)ofd/food products nec | 32 | 1,478 | 2,502 | 2,080 | 2,444 | 2,366 | 2,174 |
| 63 | Other made-up textile articles; sets; worn clothing and worn textile articles;rags | (27)tex/textiles | 24 | 1,756 | 1,501 | 1,828 | 1,994 | 2,284 | 1,873 |

Source: GTAP version 9 *database* and ITC (2019), processed

There is an impact caused by the request-offer scheme of Taiwan and Indonesia on the Indonesian sectoral economy. Referring to the results of the GTAP simulation version 9, the Indonesian sector has experienced an increase in output according to the findings of Betrix *et al* (2019). The simulation of a 95% tariff reduction in the request-offer sector has the greatest impact on the increase in apparel sector output, which is 0.693 %. This is because the percentage reduction in tariffs in this simulation uses full liberalisation. The percentage reduction in tariffs in the optimistic scenario or full liberalisation reaches 95 %, which is the highest percentage reduction in tariffs.

MoFA (2018) explained that Taiwan also invests in the apparel sector in Indonesia. Investment in this sector encourages an increase in output because investment can trigger industrial development in terms of production (Aditya 2018; MoFA 2018). Gultom *et al* (2018) stated that the added value of Indonesia's sectoral production is relatively low. Almost most of Indonesia's output has declined as a result of the cooperation scheme between Taiwan and Indonesia in the field of trade. Table 6 illustrates the sectors that experienced the largest increase in output in the simulation of half liberalisation or a 50% reduction in tariffs in the Taiwanese and Indonesian request-offer sectors and full liberalisation, *i.e.* a 95% reduction in tariffs in the Taiwanese and Indonesian request-offer sectors.

Table 6. The Largest Increase in Output of Taiwan and Indonesia Request-Offer Schemes (%)

| Sectoral | Simulation of 50% Tariff Reduction | Sectoral | Simulation of 95% Tariff Reduction |
|---|---|---|---|
| *wap* | 0,3142 | *wap* | 0,6926 |
| *ofd* | 0,0542 | *ofd* | 0,1329 |
| *fsh* | 0,0289 | *fsh* | 0,0646 |
| *ele* | 0,0281 | *ele* | 0,0603 |
| *tex* | 0,0124 | *tex* | 0,0293 |
| *v_f* | 0,0120 | *v_f* | 0,0269 |
| *cns* | 0,0088 | *cns* | 0,0180 |

| *fmp* | 0,0071 | *fmp* | 0,0144 |
| *nmm* | 0,0048 | *i_s* | 0,0098 |
| *i_s* | 0,0048 | *nmm* | 0,0096 |

Source: GTAP version 9 database, *processed*

Only *ofd* and *fsh* increase in output in all simulations. This is because Indonesia and Taiwan also built special cooperation in the fisheries sector (MoFA 2016; Marston and Bush 2018). As an implication, Indonesia's fisheries sector has a great opportunity to develop its production to meet the import needs of partner countries. In all simulations, only 3 out of 4 sectoral demands for Indonesia were included in the 10 exports that experienced the greatest increase. The three sectors are sectoral (04) *v_f*; (14) *fsh*; and (25) *ofd*. According to research by Novianti *et al* (2024), Indonesia's agricultural product export strategy requires improving product quality, proactive trade diplomacy, value addition, and the use of digital trade platforms.

Based on the results of the GTAP simulation version 9, the largest increase in exports in the tariff reduction simulation of 50 % and the tariff reduction simulation of 95 % occurred in the textile sector, namely 0.834 % and 1.844 % according to the results of research by Betrix *et al* (2019). The sector that experienced the largest increase in imports was textiles. The textile sector is also included in Indonesia's offer scheme to Taiwan. In the simulation of a 50 % tariff reduction simulation, the textile sector experienced an increase in imports by 0.8443 % and in the simulation of a 95 % tariff reduction, the textile sector experienced an increase in imports by 2.0365 %.

In the simulation of a tariff reduction of 50 % and a simulation of a tariff reduction of 95 %, only 3 out of 4 sectors included in Indonesia's request recommendation to Taiwan experienced an increase in the workforce. These sectors are *ofd*; *fsh*: and *v_f*. Of all the simulations, the sector that experienced the largest increase in labour force (educated and uneducated labour) was the steam or clothing. The largest increase in sectoral labour in the steam or apparel sector was obtained as a result of a simulation of full liberalisation or a 95 % reduction in tariffs.

The increase in the workforce in the apparel sector in the simulation of full liberalisation or a reduction in tariffs by 95 %, namely 0.686 % for uneducated workers and 0.691 % for educated workers. This suggests that there is less increase in the workforce in this sector in the uneducated workforce than in the educated workforce (Elisabeth 2014, and Betrix *et al* 2019).

The apparel sector has experienced an increase in demand for uneducated labor as well as uneducated labour. The increase in the uneducated workforce was smaller than the increase in the educated workforce in all simulations. According to MoFA (2018), Taiwan invests in several Indonesian industries, such as non-metallic mining, furniture, trade in services, textiles, agriculture, footwear, tyres, metals, and so on. Based on the findings of Aditya (2018); MoFA (2018), the influence of investment can encourage job growth in Indonesia. Intuitively, increased investment can encourage companies that receive injections of funds and capital from investors to expand their production scale.

**CONCLUSION**

The reduction in tariffs in the request-offer schemes of Taiwan and Indonesia has an impact on Indonesia's sectoral economy through semi-full liberalisation (pessimistic scenario) and full liberalisation (optimistic scenario). In terms of Indonesia's sectoral economy, most of Indonesia's exports, imports, outputs, and employment opportunities have increased. Textile commodities in all simulations, namely a 50 % tariff reduction and a 95 % tariff reduction, experienced the largest percentage increase in exports, imports, output, and labor demand. The demand for uneducated labor increased less than the demand for educated labor. Indonesia needs to take advantage of opportunities for cooperation with Taiwan through several strategic and effective policy suggestions and protect national interests.

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