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**Article**

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## The Effects of Protectionism on the Exports of the Trade Partners: A Composite Index

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ARTICLE INFO	ABSTRACT
<p>Article History</p> <p>Received 11 February 2022; Accepted 6 July 2022</p> <p><i>JEL Classifications</i> F10, F14, F40</p> <p><b>Keywords:</b> Protectionism, Global trade, Exports, Composite Index</p>	<p><b>Purpose:</b> This study constructs a quantitative tool that can interpret the effects of trade protectionism on trading partners.</p> <p><b>Design/methodology/approach:</b> Trade protectionist policies are a crucial phenomenon of international political economy. The existing literature has analyzed the consequences, causes, and effects of trade protectionist policies. A principal aspect of the present study is the diverse consequences of the operation of protectionism on trading partners. The central question is this: exactly in what way are the exports of trading partners influenced by a trade “war”? The methodology utilized is the composition of a Composite Index (CI).</p> <p><b>Findings:</b> The analysis of this paper showed that the country's participation in international trade flows, economic and commercial strength and symmetrical or asymmetric interdependence with the countries involved on trade protectionism are the important aspects that determine the significance of the protectionist effects.</p> <p><b>Research limitations/implications:</b> The composite index signifies the amount of the impact and not the kind. Actually, a state can have an unimportant influence on the trade protectionist policies of two of its trading partners, but this consequence could have an undesirable connotation. The reason is that the index does not examine the entire exports of a country, but the proportion of trade interconnections.</p> <p><b>Originality/value:</b> The composite index is crucial for interpreting the effects of a phenomenon of global political economy.</p>

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### 1. Introduction

Trade protectionist policies are a critical phenomenon of global economic relations. The phenomenon of protectionism has a simultaneous effect as that of the phenomenon of international trade. According to Shafaeddin (1998) many developed countries have managed to develop through protective measures. There are many reasons for implementing protective measures (Abboushi, 2010). According to Melgar et al. (2012) a large increase in the unemployment rate or inflation may increase protectionist attitudes. Kutlina-Dimitrova & Lakatos (2017) described the potential (negative) effects of the application of protective measures worldwide and reported that, while protective measures have an attractive connotation, especially for the short term, the increase in global protectionism is likely to have wide-ranging negative consequences for the whole economy, for consumers, for producers (businesses), for governments, investments, and trade flows. Note that protectionist policies form the basis of the "strategic trade policy"<sup>2</sup> argument, which has as its central point the ability of government policy (which has the means) to change the competition to favor domestic companies as opposed to foreign companies (Coughlin et al., 1988).

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<sup>2</sup> Krugman (1987) mentions this argument.

In the current period, the world community has witnessed a trade quarrel between the US and China that has reached the dimensions of a trade "war." Studies have argued that the reason for this "war" may be China's "mercantilist" economic policy (Beeson (2009); Hawkins (2005); Yu (2019); Atkinson et al. (2017)). Essentially, the causes of the trade war are firstly, the high bilateral trade deficit of the US. Moreover, China charges an upper tariff on imports from the US (non-reciprocal trade policies). Furthermore, the US accusation through American multinational companies of transferring the technology of American companies legally and illegally within China, and another cause is the dynamics of threatening the position of the dollar as a reserve currency from the Chinese currency. The main reason that explains the intensity of the trade war is the technological leadership in several areas that are considered critical to national security for both countries (Feenstra & Sasahara (2018); Vani (2020); Kalsie & Arora (2019); Edwards (2018); Gros (2019)).

The commercial confrontation among US-China is a multifaceted economic phenomenon. That is, there are several important aspects of the trade war between these two countries that do not only belong to the field of trade rivalry. Otherwise, it can be said that the trade war is the "tip of the iceberg" in a series of broader economic rivalries. In other words, the reasons that have led to the declaration of this war should be mentioned as thoroughly as possible. The US's main impeachment of China is the accusation of "unfair" trade practiced by China. It should not be forgotten that the US has lost five million jobs in the industrial sector since 2000, particularly in the manufacturing sector (low-wage labour force (Feenstra & Sasahara, 2018)). Such decline has been exacerbated by China's admission to the WTO (Bartash, 2018). Because of this economic situation, it is reasonable for the US to reproach China. Of course, the US accusations about China's "unfair" trade relate to the rising trade deficit, intellectual property theft and the compulsory allocation of US know-how to China (Vani, 2020). It is interesting to present the causes of the war (Kalsie & Arora, 2019). In particular, the first cause is the high bilateral trade deficit with the US. The second reason is that China charges an elevated tariff on imports from the US - non-reciprocal trade policies. The third cause is the accusation by the USA - through us multinational companies - of transferring the technology of American companies by legal and illegal means to China. Later, China's industrial (protectionist) policies are another rebuke of the US accusing China of an increased role for the government in upgrading Chinese industry - economy. Still, the U.S. believes that China can evolve more technologically advanced in a range of industries that can be a heavy cost to the U.S. Next, another cause is the dynamics of the rivalry and competition of multinational companies of an emerging economy (such as China) with multinational companies based in advanced economies. Finally, another cause is the dynamics of the threat of the dollar's position as a reserve currency by the Chinese currency. In essence, China has acquired the criteria by which it can compete with America (Edwards, 2018). Although the reasons given have an economic background, they do not explain the intensity of this trade war. The main reason for these is technological leadership in several areas considered critical to national security for both countries (Gros, 2019).

Trump's trade wars show two aspects of the international system (Liu & Wing, 2018). The first aspect is the increased concern for national security. The second aspect must do with the reluctance of the US to continue to promote economic globalization. The economic differences expressed in trade wars are a systematic feature of the current situation. The current situation is an uncoordinated multipolar political-economic international order. The causes of the trade war include macroeconomic issues such as unemployment and the trade deficit, to geo-strategy and international policy issues such as national security. Any trade war can have winners and losers. What is certain is that the consequences of this war are significant because of the position occupied by the countries concerned in the international economic system.

To find out the outcomes of the US-China commercial conflict, it will be necessary to examine whether there have been and to what extent-negative or positive effects on the other countries of the international economic system. The degree of influence of the trade war and the type of effect is the measure by which the consequences of the trade war can be controlled. The imposition of U.S. protectionist measures has created an indirect impact on Thailand's trading partners through the global slowdown in the economy (declining global demand), for example China (Nidhiprabha, 2019). The U.S. trade war with China is hurting Japanese multinational corporations (Sun et al., 2019). Since more than 40% of China's exports were made by foreign multinational companies, the tariffs of the U.S. leadership Trump, fall on products coming from China, the subsidiaries of Japanese multinationals may take the burden of protective measures. India has a trade surplus with the US. The trade war with the US could damage India. If the war continues and worsens, then it says that the trade deficit and India's current account deficit will widen. Both the domestic market and industries, mainly pharmaceuticals, clothing, and textiles, will be affected (Mandal, 2018). The U.S. trade war with China may lead in the long term to rising inflation, a shortage of resources, environmental damage to the lack of work in Vietnam (Lam & Nguyen, 2019). The high liberalization of Vietnam's trade and the fact that both China and the United States are its main trading partners are the reasons for the great fall. Indonesia's exports continue to be affected by a rate of -0.24 from the trade war (Taufikurahman & Firdaus, 2019). Since the US trade war with China, the European Union and its Member States have been affected by a very small percentage. That is, there is a slight decline in GDP, (a decrease of 0.1 percentage points from the current state of the US-China trade dispute) (Breuss & Christen, 2019). The U.S.-China trade war may be beneficial for Latin American countries (Laborde & Piñeiro, 2019). In particular, in the short term, as the escalation of tariffs and retaliation between the countries will increase, this affects making Latin American countries' exports more attractive. The real effect of the China-US trade quarrel on Hong Kong's economy is indirect (Lau, 2019). The sector that will be affected first is national consumption. Then, because tourists from mainland China to Hong Kong make up almost 80% of the total

number tourists of 65 million per year, the slowdown in the mainland Chinese economy will affect Hong Kong's tourism industry. The consequence of the U.S.-China trade conflict on Canada's trade is estimated to be significant, and the degree of impact depends on Canada's access to the U.S. market (Charbonneau, 2019).

As far as emerging economies are concerned, the two countries' trade war could have benefits instead of losses (Carvalho et al., 2019). In particular, for developing countries that were not directly affected by the actions of the commercial confrontation, their exports could be profitable, especially in sectors where these countries are competitive. For countries - other Asian economies - there may be benefits from the trade war through trade diversion in competing export sectors with China, but they may be damaged in sectors linked through supply chain networks to China (Gentile et al., 2020). The following can be mentioned the effect of the trade war between the US-China on most countries and their industries. In the agricultural sector, Brazil and Argentina are likely to export to a lesser extent, in the manufacturing sector, the largest market share losses are expected to be experienced by Japan and Germany, in the energy sector, Saudi Arabia, Australia, Russia and Korea as well as Angola, Indonesia, Mongolia, Turkmenistan, Singapore and Malaysia face a possible jeopardy of loss (Freund et al., 2020).

U.S. - China trade confrontation began in 2018. From July to December 2018, the trade - tariff war escalated<sup>3</sup>. The trade war between the two countries is a zero-sum game. There is no winner or loser from the clash of these two powers. Both countries do not profit from their trade conflict. The U.S. has no sound reason to exercise trade protectionist means. China has nothing to lose from the imposition of trade tariffs against it. The question that arises is what is the effect of the trade conflict. The effects of this trade combat must be properly and mostly quantitatively investigated. The way of studying the outcomes can be a composite index. The idea of this research paper is that the consequences of trade dispute on the exports of trading partners are formed by the combination of three pillars. A collective investigation of the size of trade in value added, productivity and interdependence verify whether the consequences on a state are noteworthy or not. With the U.S. - China trade war as a case study, this analysis<sup>4</sup> shall develop a quantitative tool appropriate for calculating the effects of trade protectionism on the exports of trading partners. The quantitative tool is the *Composite Index of the Intensity Effect of Trade Protectionism*.

The rest of this study is organized as follows: next, the theoretical basis of the pillars for the indicator is quoted. Next the methodology is cited. In the end the demonstration of the composite index is quoted. The present study was based on the construction of a composite indicator (CI) (quantitative procedure of assessment).

## 2. The theoretical frame of the Composite Index

The indicator is constructed by three pillars. Firstly, the *trade in value added*, secondly, *productivity*, and thirdly, *interdependence*. These pillars have the ability to describe the impact of the trade protection procedures of two countries on the exports of their trading associates. It is essential to describe the pillars distinctly to apprehend their selection.

First, the choice of trade in value added<sup>5</sup> was made because Global Value Chains (GVCs) and trade in intermediate goods are an undeniable reality of the modern global economic system<sup>6</sup>. Today, two fundamental characteristics should be mentioned, firstly, intermediate inputs could influence the development in trade and secondly, the GVCs affect not only the intensity but also the structure of global trade (Kelly & La Cava, 2013). Many studies have proved that the productivity of a company is related to imported inputs<sup>7</sup>. Studies such as Kasahara and Rodrigue (2008), Halpern et al. (2009), Castellani & Fassio (2019), Smeets and Warzynski (2010), and Bas and Strauss-Kahn (2011) are examples. Still, studies have proved that the decrease in charges on imported inputs assists the productivity of many businesses (Amiti and Konings (2009), Goldberg, et al. (2010), Feng et al. (2012), Lileeva and Trefler (2010) and, Yu (2011)). Imported intermediates have a boosting result on the productivity of companies. Notable is what Zaclicever (2019) states. Especially, the variety of the geographical origin and the diverse categories of intermediate imported products make possible positive results on the export activity of the industries. The changes in trade obstacles in the intermediate imported goods habitually have an important effect on export operation in the final product sector (Navas et al., 2014). A significant argument is made by Grossman and Helpman (2021). That is, they state that great tariffs are impracticable for the reason that they compel businesses to acquire from fewer competent traders. A central component of intermediate merchandises is that the country's consumers do not directly address the domestic price of the intermediate good (Batra & Naqvi, 1989). Furthermore, Jamil and Arif (2019) mention that the decrease in tariffs on intermediate inflows may have advantages for states. Especially, imported intermediate inputs can advance both the export price and the size. However, the price of the intermediate good causes disturbances in the productive activities of the country. In fact, when a country is very dependent on intermediate inflows from another country, it is not in the interest of that country to impose tariffs on its trading partner. That is to argue, the assumption on the basis of which the first pillar option is based is that countries that

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3. See: Bown (2021).

4. A similar procedure has been carried out by Karakostas (2021, 2022a, 2022b).

5. Concerning the determining factors of trade in value added see: Choi, (2013), Yücer et al. (2014), Nakazawa et al. (2014), Guilhoto et al. (2015) and concerning the measurement of value-added trade see: Johnson and Noguera (2009) and Daudin et al. (2009).

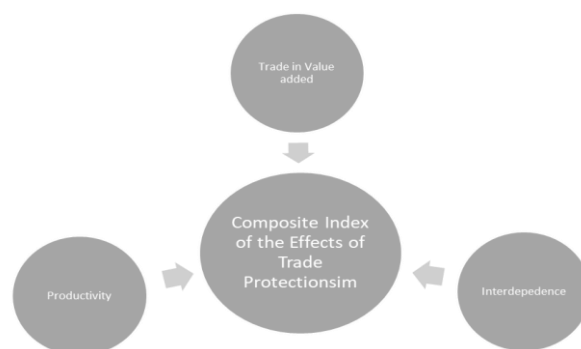
6. As Choi (2020) states the GVCs have become the base for the national development strategies.

7. See: Romer, (1987), Rivera-Batiz & Romer, (1991), Backus et al. (1992).

have a high proportion of exports of intermediate goods are not harmed as much as countries that have a small proportion of exports of intermediate goods. So, it is very important the share in the exports of intermediate goods.

The second pillar is productivity. The choice of productivity was made for the reason that it contributes to the exports of a country. Productivity is positively linked to the performance of exports and can be considered a critical factor in the survival of a country's exports to the foreign market. Examples of this supposition are Yasar et al., (2003); Wagner, (2002); van Biesebroeck, (2003); Mengistae and Pattillo, (2004); Liu et al., (1999); Hallward-Driemeier, et al., (2002); Greenaway & Kneller, (2003); Greenaway and Kneller, (2004a); Sjöholm, (1999); Greenaway and Kneller, (2004b); Greenaway and Yu, (2004); Castellani, (2002); Bernard et al., (2003); Clerides et al., (1998); Bernard et al., (1999); Bernard and Jensen, (2004a); Bernard and Jensen, (2004b); Baldwin and Gu, (2003); Aw and Hwang, (1995); Kraay, (2002); Arnold and Hussinger, (2004); Aw et al., (2000); Melitz, (2003) and, Ghironi and Melitz, (2005). Ayadi and Mattoussi (2014) report the link between productivity and commercial performance. Essentially, this bond is innovation. Innovation plays a significant role because the technological nature of the product makes the product a monopolistic product, due to its innovation (Fare et al., 2012). The choice of the productivity pillar was made for the main reason that when a country has high productivity its exports can face any challenge. Even if challenges are of a commercial and protective nature. That is, productivity determines the “quality” of goods and thus renders protective measures ineffective. As reported by Akcigit et al. (2018)<sup>8</sup>, differences in productivity lead to the definition of trade flows. They also state that the productivity (quality) of intermediate goods determines the choice of the producers of the final products whether to choose domestic or foreign intermediate goods. Essentially, the choice of productivity proves that the potential of an economy - expressed in productivity - can be the key to weakening the effects of protectionist measures imposed directly on a country or indirectly.

The third pillar chosen is interdependence. The choice of interdependence is because the more a nation is interdependent with a trading partner, the stronger the effects of the protectionist tensions it can create with other countries will be. The kind of interdependence is great. That is, the existence of, for example, Foreign Direct Investments<sup>9</sup> (FDIs) achieves the reduction of protective measures. This is partly true. As Blonigen and Feenstra (1997) mention, the deterrent outcomes of foreign direct investment apply according to the type of FDI and according to the type of protection. It is therefore appropriate to define the trade interconnection of countries as the appropriate measure of interdependence. Trade barriers vary greatly between countries and industries (Wang, 2001). Studies such as Frankel and Rose (1997), (1998); Clark and van Wincoop (2001); Fatas (1997) argue that when two countries have a high trade bond then they have highly correlated business cycles. Choe (2001) studying the effects of commercial interdependence and business cycles found that there is a correlation. Studies such as Rana (2007) and, Allegret and Essaadi (2011) found the same synchronization. In other words, they found that the intense bilateral trade between countries is exacerbating synchronization. Baxter and Kouparitsas (2005) found that there is a strong correlation. Juvenal and Monteiro (2017) and, Surugiu and Surugiu (2015) have reported the relationship between trade and business circles. Ning and Ye (2012) found that there is a synchronization between bilateral trade and economic performance. He and Liao (2012) and Lee and Azali (2010) report that trade fostered the business cycle co-movement. Rana et al. (2012) state that intra-industry trade development was the key force rather than the inter-industry trade. Wang (2010) and, Zhang and Akmetova (2018) argue that bilateral trade is a factor that creates this concurrence (the other factor is FDI). The main reason why interdependence has been chosen as the third pillar is because trade<sup>10</sup> interconnection is essentially the channel through which any fluctuations can be more easily transferred. For example, Wu and Pan (2014) (by researching bilateral economic relations between Japan and China) have shown that this correlation must exist. Figure 1. presents the Composite Indicator.



**Figure 1. The pillars of the indicator**

**Source:** Author's conceptual framework

8. They mention: "... failing to incentivize U.S. firms to accelerate technological improvement, the protectionist policy cannot compensate for the loss of high-quality imports and leads to substantial welfare losses in the medium to long run ..." (p. 55).

9. See: Bhagwati et al. (1987); Dinopoulos (1989); Dinopoulos and Wong (1991); Dinopoulos (1992); and Bhagwati, et al. (1992).

10. There are studies such as Kumakura (2006) and Shin and Wang (2003) that report that there is no significant correlation.

The abovementioned pillars can describe the diverse consequences that the two countries' trade protectionist policies have on their trading partners. The first pillar suggests a state's participation in international trade flows, the second pillar has the ability to articulate the economic and trade potency of a country and the third pillar implies the balanced or asymmetric dependence of a country with the countries concerned in trade protectionist policies. The following unit portrays the methodology to be followed.

### 3. Methodology

The principal idea of this research is to create an Index that determines the consequences of the trade protectionist policies on the exports of the trade partners quantitatively. The methodology is a calculable approach. The index to be constructed is a composite indicator. Nardo et al. (2005, p. 7) indicated what a composite index is. Actually, they quote:

*"... a composite indicator is the mathematical combination of individual indicators representing different dimensions of a concept, the description of which is the objective of the analysis ..."*

The OECD Handbook on Constructing Composite Indicators (OECD, 2008) is the guide for the formation of the index. The Min-Max Normalization Method is the method of normalization. Freudenberg (2003) states that composite indicators are a gradually operated means for evaluating countries' performances at particular scientific subjects. Examples are competitiveness, innovation, etc. In accordance with the OECD (2008, p. 28):

*"Min-Max normalizes the indicators so that they have the same range [0,1] by subtracting the minimum value and dividing by the range of the index values ..."*

The Min-Max Normalization equation is the following:

$$C = (\text{Value} - \text{Min}) / (\text{Max} - \text{Min}) \quad (1)$$

The normalization procedure followed by the World Economic Forum is as follows, in proportion to Schwab (2019: 614), each sub-index is developed in accordance with the following:

$$\text{Score}_{i,c} = (\text{Value}_{i,c} - \text{wp}_i / \text{frontier}_i - \text{wp}_i) * 100 \quad (2)$$

where  $\text{Value}_{i,c}$  is the value of sub-index  $i$  of country  $c$ , the worst performance ( $\text{wp}_i$ ) is the lowest acceptable value for sub-index  $i$  and  $\text{frontier}_i$  corresponds to the highest value (at best possible result) for sub-index  $i$ .

Both the normalization and concentration method utilized by the World Economic Forum to structure the Global Competitiveness Report is operated. The World Economic Forum utilizes the Min-Max method (ranging from 0 to 100) for the normalization of each sub-index.

As stated by Ochel & Rohn (2006), the Min-Max Normalization process is followed by the Fraser institute: Economic Freedom of the World (EFW index) and World Economic Forum (WEF) Growth Competitiveness Index (GCI). This method of normalization was selected because keeps the relationship among the original data (Aksu et al. 2019). The reported method normalizes the data by comparing and determining the best value as the largest and the worst value as the smallest.

With regard the concentration stage, the method utilized by the World Economic Forum is followed. The procedure of obtaining the average is followed. The process is stated in the Global Competitiveness Report. As Petkovová et al. (2020) describe, the mostly used approaches for aggregation are arithmetic and geometric averages. They refer that both simplicity and general awareness of their calculation are the main advantages.

Talukder et al. (2017, p. 8) quote:

*"Commonly applied aggregation options include additive aggregation (arithmetic mean), [...] The arithmetic mean is a linear function. The normalized [...] indicators are summed to compute the arithmetic mean ..."*

The method for assessing the arithmetic mean is:

$$x = \sum^n =_i x / N \quad (3)$$

As stated by Mazziotta & Pareto (2013) there is no common technique to create an indicator, but then again, they state four stages to develop an indicator. The first stage is the description of the phenomenon. Second the assembly of individual indicators. Third the normalization of the individual sub-indicators and lastly the aggregation of the normalized indicators. The indicator consists of three (3) pillars. The criteria for each pillar were based on the literature analysis. Figure 2. shows the function of the Index.



Figure 2. Schematic Display of the Function of the Index

Source: Theoretical approach of the author

The indicators of the first pillar are the percentage (%) Intermediate Product Exports, because it can explain the country's participation in Global Value Chains (international trade flows)<sup>11</sup> and the Revealed Comparative Advantage (RCA)<sup>12</sup> of the Intermediate Product Exports. The best value is the highest. The worst value is the lowest. The indicators of the second pillar are the Total Factor Productivity (index - level at current purchasing power parities) because to the fact that can clarify the economic strength of a country<sup>13</sup>. The best value is the highest. The worst value is the lowest. The indicators of the third pillar are the Trade Intensity Index<sup>14</sup> with US and China distinctly because this indicator is efficient of explaining the trade connection of two trading partners<sup>15</sup>. The best value is the lowest. The worst value is the highest. This indicator is estimated for both countries distinctly. The database for this study is World Integrated Trade Solution (WITS), Federal Reserve Economic Data (FRED) and The World Bank.

The countries chosen are four (4) and are: *Switzerland, India, Japan, and Brazil*. The states were chosen indicatively on the basis of a principal standard. The standard is that it should be of a diverse economic level. Actually, developed countries and developing (UN, 2021). The selection of countries was based on the availability of data.

The year chosen is 2019 and was selected for the reason that it is the time directly afterwards the operation of protective actions by both states and previously the pandemic. The year presents a more actual examination of the matter at issue. A specific period cannot be investigated because there cannot be an adequate time range of analysis. The reason is that the trade protection policies between the countries concerned do not cover a long-time range.

The meaning of the index is the following: *the higher the value of the composite index, the smaller the effect of trade competition on the exports of the countries concerned*. The indicator reveals an inversely proportional association. The composite index estimates the strength of the consequences of trade protectionism on the exports of trading partners and not the kind since the consequences may differ, i.e., be negative or positive<sup>16</sup>. The following unit will display the outcomes and show the composite index.

#### 4. Calculation and Demonstration of the Index

This unit presents the indicator. To assess the consequences of trade protectionism, the following stages will be taken. First, the normalization of the data will follow. Table 1. shows the values of the selected indicators<sup>17</sup> of Switzerland, India, Japan, and Brazil for 2019.

11. See: OECD (2015).

12. The Revealed Comparative Advantage (RCA) is calculated by the formula:

$$RCA_{ij} = X_{ij} / X_j / X_w / X_{iw} \quad (4)$$

where  $X_{ij}$  is the exports of country  $j$  of product  $i$ ;  $X_j$  is the sum of exports of country  $j$ ;  $X_{iw}$  is the world exports of product  $i$ ;  $X_{iw}$  is the World Total Exports. The RCA ranges between zero and unity in case a country is not intense in exports and from one to infinity if it is intense (Balassa, 1965).

13. See: Truong (2016) and Isaksson (2007).

14. The Trade Intensity Index (TII) is calculated by the formula:

$$TII_{ij} = (X_{ij} / X_{iw}) / (X_{wj} / X_w) \quad (5)$$

where  $X_{ij}$  is the values of country  $i$ 's exports to country  $j$ ,  $X_{wj}$  is the values of world exports to country  $j$ ,  $X_{iw}$  is the country  $i$ 's total exports and  $X_w$  is the total world exports. The Trade Intensity Index is used to determine whether the value of trade between two countries is greater or smaller than would be expected on the basis of their importance in world trade. An index of  $TII_{ij} > 1$  indicates a bilateral trade flow that is larger than expected, given the partner country's importance in world trade while  $TII_{ij} < 1$  indicates a bilateral trade flow that is smaller than expected, given the partner country's importance in world trade (Maryam et al, 2018).

15. See: Wolfgang (1978).

16. See: Sun et al. (2019); Mandal, (2018); Taufikurrahman & Firdaus, (2019); Breuss & Christen, (2019); Laborde & Piñeiro, (2019); Carvalho et al. (2019); Robinson & Thierfelder, (2019).

17. For the Trade Intensity Index, see Appendix.

**Table 1.** The Values of the selected indicators for Switzerland, Brazil, United Kingdom, India, for the year 2019.

<i>Country</i>	<i>Product Share of Intermediate Exports to the USA* (%)</i>	<i>Product Share of Intermediate Exports with China* (%)</i>	<i>RCA of Intermediate Exports to the USA* (Index 2009=100)</i>	<i>RCA of Intermediate Exports with China* (Index 2009=100)</i>	<i>Total Factor Productivity at Constant National Prices** (Index 2017=1, Not Seasonally Adjusted)</i>	<i>Trade Intensity Index*** (with USA)</i>	<i>Trade Intensity Index*** (with China)</i>
<i>Switzerland</i>	33.7	52.9	1.36	3.24	1.02	0.94	0.66
<i>India</i>	27.0	44.9	1.81	2.63	1.02	1.07	0.48
<i>Japan</i>	11.3	24.5	0.81	1.15	1.00	1.64	2.24
<i>Brazil</i>	33.9	10.0	2.12	0.49	0.97	1.15	3.57

To finish the formation of the indicator, the normalization of the values and calculation of the average follow. Table 2. presents the normalized values. Table 3. shows the average. The average of the values is basically the values of the composite index.

**Table 2.** The normalized values for the selected countries.

<i>Country</i>	<i>Product Share of Intermediate Exports to the USA (%)</i>	<i>Product Share of Intermediate Exports with China (%)</i>	<i>RCA of Intermediate Exports to the USA (Index 2009=100)</i>	<i>RCA of Intermediate Exports with China (Index 2009=100)</i>	<i>Total Factor Productivity at Constant National Prices (Index 2017=1, Not Seasonally Adjusted)</i>	<i>Trade Intensity Index (With USA)</i>	<i>Trade Intensity Index (With China)</i>
<i>Switzerland</i>	99.12	100.00	41.98	100.00	100.00	100.00	100.00
<i>India</i>	69.47	81.35	76.34	77.82	100.00	81.43	106.19
<i>Japan</i>	0.00	33.80	0.00	24.00	60.00	0.00	45.70
<i>Brazil</i>	100.00	0.00	100.00	0.00	0.00	70.00	0.00

**Source:** Author's calculation.

Table 3 displays the values of the index.

**Table 3.** The Index

<i>Country</i>	<i>Values of the Composite Index</i>
<i>Switzerland</i>	91.59
<i>India</i>	84.66
<i>Japan</i>	23.36
<i>Brazil</i>	38.57

**Source:** Author's calculation.



It is not easy to have a complete validation of the index. Due to the fact that there is no suitable time frame of more than a decade concerning the trade conflict (trade protectionist policies) of the US-China. Yet, to gain an adequate authentication of the index, a comparison of the prices of the index with the standard deviation<sup>18</sup> of the percentage change<sup>19</sup> in the exports of goods and services of the concerned countries can be made for the years 2017-2020. Table 4. shows the exports of the countries Switzerland, India, Japan, and Brazil.

**Table 4.** Exports of Goods and Services (% change from year ago - seasonally adjusted - annual, average) of the selected countries, for the years 2017-2020.

<i>Year</i>	<i>Switzerland</i>	<i>India</i>	<i>Japan</i>	<i>Brazil</i>
<b>2017</b>	0.51	9.71	11.33	5.48
<b>2018</b>	5.34	15.63	4.82	24.33
<b>2019</b>	0.18	4.90	-4.36	1.80
<b>2020</b>	-7.95	-6.37	-14.12	20.18

Table 5. displays the values and the Standard Deviation of percentage change in Switzerland, India, Japan, and Brazil.

**Table 5.** Assessment of the values of the Index with the Standard Deviation of the Percentage Change in Exports of Goods and Services for Switzerland, India, Japan, and Brazil for the years 2017-2020

<b>Switzerland</b>	Value of the Index: 91.59 - Standard Deviation of the percentage change in Exports of goods and services: 4.77
<b>India</b>	Value of the Index: 84.66 - Standard Deviation of the percentage change in Exports of goods and services: 8.07
<b>Japan</b>	Value of the Index: 23.36 - Standard Deviation of the percentage change in Exports of goods and services: 9.60
<b>Brazil</b>	Value of the Index: 38.57 - Standard Deviation of the percentage change in Exports of goods and services: 9.51

**Source:** Author's calculation.

The outcomes of this comparative examination are that Switzerland with the highest value has the smallest effect from the trade protectionist policies of the US-China. In contrast, Japan has the highest effect with the lowest price of the composite index. Concerning developing countries, it is observed that India has less effect than Brazil. It is certain that the outcomes of the trade protectionist measures among the US-China are not separated from the causes of a country's economic performance but from the structural and commercial features of each country.

## 5. Conclusion

The effectiveness of the trade protectionism is influenced by two factors: The first is that a country to develop competitive products, the import tax that adds value (taxes on the intermediate goods) to the country's exports should be low. Additionally, the country's export tax should be just as low for its trading partners (taxes on the final goods of trading partners on imports of the country). Concurrently, the second factor should also apply, namely the tax on imports of final products from trading partners to be as high as possible. Thus, that the state can export the final goods at a competitive price. Fundamentally, the consequences of trade protectionist policies are exacerbated or mitigated for a trading partner according to the pillars of the index built in the present analysis.

This paper created an index. The index is the *Composite Index of the Effects of Trade Protectionism*. This analysis is an effort to measure a basic fact in global economic affairs. The indicator can determine the scale of the influence of two countries' trade protectionist policies on trade partners' exports.

18. Standard deviation is a statistical measure used by researchers to calculate the amount of change or dispersion of a set of data value s. The greater the standard deviation, the more the values are distributed. The smaller the standard deviation, the less the sample values are distributed. Variance is the square of the standard deviation and measures the variability of observations around the mean value. Basically, the standard deviation describes the standard distance of an observation from the distribution center or mean value. The formula for standard deviation

is as follows (Hassani et al., 2010):  $SD = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n - 1}}$

19. See: Andersen (2019).

The indicator can determine the scale of the consequences of trade protectionism for the next reasons. The participation in intermediate goods makes a country a strong trading partner and excludes as far as possible any trade confrontations. This makes its exports indispensable. Moreover, a country's productivity indicates how competitive it can become. The upper the productivity can be, the greater competitively it turns out to be. This formulates its exports strong. Furthermore, trade interconnection could reveal interdependence with trading partners. The bigger the trade interconnection, the bigger the interdependence. How commercially interconnected the country is, also shows how symmetrically or asymmetrically it is reliant. The usage of the indicator can be utilized to any trade dispute between states and to clarify the consequences for any trading partner. The outcome of the study makes the index an efficient and suitable means for understanding the consequence of trade protectionism on trade partners' exports.

To come to the point, the reasons for the valuableness of this index are its overall use, since the explanation of the consequences is not restricted to particular states but to the whole global economic system and, secondly, to the wide-ranging frame of explanation, because the selection of pillars includes - as far as possible - the range of global economic affairs. This study offers a primary examination on the consequences of trade protectionism on the exports of the trade partners. The theoretical basis and the outcomes of the index are robust conditions for the consistency and functionality of the index created in this research.

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## Appendix

2019	Bn (\$)		
Country	Exports to USA	Exports to China	Total Exports of the country
<i>Switzerland</i>	43	21	479
<i>India</i>	54	17	529
<i>Japan</i>	140	134	894
<i>Brazil</i>	29	63	264
<i>World</i>	2,364	1,655	24,780

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