Original Paper

Impacts of Trade Protection by Tariffs on Agricultural Imports and Exports by Using GTAP Model: A Case Study in Vietnam

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Abstract

International economic integration has brought high growth to international trade while promoting economic development for many countries around the world. However, in recent times, in the world, there has appeared a trend opposite to trade liberalization, which is protectionism. Advocates for trade protection provide arguments for why countries implement trade-restrictive measures. Those causes are related to national security and defense, solving the trade deficit, creating jobs, protecting the nascent industry and ensuring fair trade. Countries are currently using tariff measures including import and export tariffs, and non-tariff measures. The article studies protectionism, analyzes the impact of trade protectionism by tariffs on Vietnam's GDP and exports, and makes policy recommendations for the Government of Vietnam.

Keywords

trade protection, tariff, Vietnam's exports, international trade, GTAP Model

JEL Classification Codes: F02, F13, F17

1. Introduction

Trade protection is the deliberate attempt to limit imports or promote exports by putting up barriers to trade. Despite the arguments in favour of free trade and increasing trade openness, protectionism is still widely practiced. Barriers to trade can be used to protect sunrise industries, also known as infant industries, such as those involving new technologies. This gives new enterprises the chance to develop, grow, and become globally competitive. Protection of domestic industries may allow they to develop a comparative advantage. For example, domestic enterprises may expand when protected from competition and benefit from economies of scale. As enterprises grow they may invest in real and

human capital and develop new capabilities and skills. Once these skills and capabilities are developed there is less need for trade protection, and barriers may be eventually removed.

Most countries apply protectionist policies and consider it an indispensable part of the country's economic development policy because it brings a lot of benefits. However, protectionist policies do not always bring the desired results. Unilateral protectionist policies cause socio-economic losses, directly affecting consumers and other industries in the economy. If the government implements an unreasonable protection regime, widespread protection, arbitrary protection, and excessive protection for too long, it will not only fail to achieve the purpose but also cause negative impacts. Protected manufacturing industries will not gradually grow stronger, but on the contrary may fall into a state of stagnation, reduce competitiveness, inefficient production, and falsify the comparative advantage of participating partners in the market. Reasonable trade protectionism is not only about creating barriers to prevent the entry of foreign goods into one's country, or subsidizing in any form for domestic production, but more importantly, measures such protection must achieve the objective of rational resource allocation, improving the competitiveness of domestic products in domestic and international markets. Countries are currently using tariff measures including import and export tariffs, and non-tariff measures as administrative tools including regulations on export quotas, licensing regulations, measures voluntary export law; economic levers including investment support regulations, preferential credit, price subsidies, import margin, foreign exchange and exchange rate management; technical measures such as regulations on technical standards, quality, packaging design.

Since the end of the Cold War, the world economy has been strongly influenced by the trend of liberalization and globalization of economic and trade relations. Recently, however, a number of new trends have emerged that have changed the world economic order that has existed for the past few decades. The contemporary world is undergoing great changes with many events taking place rapidly, complicatedly, and unpredictably, both bringing about opportunities, opportunities and hope to the nations and peoples in the future; poses risks, challenges and insecurities. The world, the region is facing an unprecedented threat in history, changing the mode of production, business, commerce and all aspects of social life, along with the relationship of forces, which is gradually shifting to a new situation.

Strategic competition between major countries, especially between the US and China, has become fierce, face-to-face confrontation in all fields, focusing on economic aspects, in which attention is paid to international trade and international trade issues. technology. According to Bui Thanh Tuan (2021), from the beginning of 2018 until now, the influence of the US-China trade "war" has spread globally. Faced with the negative effects of this "war", the circulation of goods is blocked, global trade becomes weak, which in turn leads to a decline in economic growth. The US economy is a large economy, each change in US policy, greatly affects other economies, especially small, open economies. Along with many other moves, such as prioritizing bilateral cooperation, withdrawing from a series of multilateral international mechanisms and agreements, to achieve the goal of "America first", "making America

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great again". The United States is ready to bring protectionism back and disrupt the long-standing international trade order. Many countries such as the EU, Japan, etc. have adjusted their trade policies to adapt to the changes of the US. This will set a precedent for the behavior of other countries in the future and reduce the role of the WTO as well as other multilateral economic and trade mechanisms. At the same time, the move to tighten protectionist measures as part of the "America First" campaign could lead to an increase in trade retaliation, even triggering a trade war on a global scale.

If the US-China trade "war" continues to drag on, it will strongly increase trade protectionism with limited state intervention policies in the economy and globalization. Therefore, the article analyzes the changes in US tariff policy affecting some economies in the world, and especially the Vietnamese economy. The article studies protectionism, analyzes the impact of trade protectionism of USA by tariffs on Vietnam's GDP and exports, and makes policy recommendations for the Government of Vietnam.

2. Literature Review

Trade protectionism is the foreign trade policy of countries aimed at using measures to protect the domestic market from fierce competition from imported goods on the one hand, and on the other hand to help the State support businesses in the domestic market and expansion into foreign markets (Balassa, 1965). According to Nguyen Mai (2018) and Amadeo (2018), trade protectionism is an economic term, referring to the application of measures to protect the country's production of goods (or services) against competition from other economies around the world.

In favor of trade protectionism, Demir and Sepli (2017) and Amadeo (2018) point out protectionist policies: Applying tariffs on imported products and thereby increasing the prices of imported goods causes they become less competitive than domestic goods. Research by Olga Solleder (2013) and Pham Sy Thanh (2019) on the trade effects of export taxes, based on a new data set of tax rates at the product level, estimates the trade-distorting effects of export taxes. The results, based on a theoretical fit estimate of the structural gravity model, indicate that the export tax burden is shared by exporters and importers and that export taxes play a role in the increase of world prices. Export taxes are associated with a significant reduction in trade, especially when applied to the extractive industries. Research by Antoine Bouët and David Laborde Debucquet (2010) on the economics of export taxes in the context of a food crisis focuses on assessing the reasons for using export taxes, especially in the context of a wage crisis. The study summarizes the effect of export taxes using both partial and general equilibrium theoretical models. Research by William Deese, John Reeder (2007) examines the issue of export taxes on major commodities. It is clear that 40 countries in the world have imposed export taxes in recent years.

Research by Aradhna Aggarwal (2004) quantitatively assesses the likely changes in market access opportunities for Indian exports due to US tariff reductions. The study identifies products specific to India at the ISIC 4-digit breakdown level, which can be considered tariff sensitive. Regression analysis

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on the relationship between the MFN tariff rate and India's exports to the US was used to quantitatively assess the impact of a possible tariff reduction in the Doha Round. This analysis shows that tariff cuts are hardly expected to benefit Indian exports to the US. With the full implementation of the tariff reduction roadmap, the increase in India's exports to the US will amount to 1.2 or 0.6 depending on the value of the B factor in the formula. These findings are most likely due to the tariff-sharing effect of NAFTA preferences in favor of suppliers in Mexico, a country that competes in many traditional commodities.

Research by Olga Solleder (2013) shows that export taxes are associated with a significant reduction in trade, especially with the horticulture and extraction industries. According to the author, the welfare implications of an export tax depend directly on the market power of countries and whether they are exporters or importers of the goods being taxed. The welfare impact on exporters without market power is ambiguous and depends on the elasticity of supply, demand, and substitution. Furthermore, reductions in taxing on exports may under certain conditions be welfare-enhancing if achieved through the achievement of relevant public policy objectives, e.g. value added, increase domestically, outpacing losses associated with falling exports. Exporters with market power clearly benefit because they can apply welfare-optimizing tariffs, place the tax burden on importers, and enjoy better trade terms.

Fugazza and Molina (2011) use the time required to export as a proxy for export costs and import as a proxy for import costs, investigating the impact of per-period fixed costs to the duration of trade relationships by employing survival analysis. He also mentioned that higher tariff rates accompany lower hazards for the duration of trade relationships because of less competition for incumbent firms; this result is also in line with Besedeš and Prusa (2006b). In other words, they evidence the significant positive relationship between tariff rates and durations of trade relationships.

Similarly, according to Antoine Bouët and David Laborde Debucquet (2010), to limit the impact of export taxes, trading partners can respond by either reducing import duties or increasing export duties, depending on the situation. They are either net importers or net exporters of goods. The results also show that there is an important asymmetry between net exporters and net importers of an agricultural commodity during a food crisis, as net exporters can benefit from increase in world prices while net importers are hurt and unable to retaliate effectively.

Research by Hertel, T, W (1999) and Farzad Taheripour and Wallace E. Tyner (2018) on the impact of China's import tax policy on US soybeans shows that both US and Chinese welfare and global welfare decrease when China imposes taxes. Meanwhile, the country that benefits is Brazil and the rest of South America, soybean exporters have great competitiveness. The combined gains for Brazil and the rest of South America are somewhat smaller than the US losses. On the other hand, the EU will be able to gain benefits in some cases and lose them in others. When the tariffs apply only to soybean products, the EU suffers a small loss in economic welfare; If tariffs were applied to all food imported from the US, the EU would see a modest increase in economic welfare (EU, 2019). The rest of the world has a welfare benefit in any case as some of these countries also export soybeans. From these conclusions, in

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order to promote exports, the solution drawn is still: (1) to choose export products with great competitiveness or need to improve the competitiveness of export products; and (2) diversify export markets.

Chin-Ho Lin (2015) explores the links between imported trade relationships, duration, and tariff rates. We investigate how the probability of survival of trade relationships affected due to the difference in the tariff rates based on survival analysis. Using ASEAN+6 as the reporter with 89 trading partners on manufactured goods from 1996 to 2011. A series of findings are as follows. First, low-tariff trade survives longer than high-tariff trade on manufactured goods. Second, a significantly negative correlation between tariff rates and duration is evidenced, which increases around 4% hazard ratios. Also, the reduction of tariff rates in intra-regional trade is helpful to prolong the length of trade relationships. Third, low tariff rates have 9.1% lower hazard ratios. The paper also obtains robust results in production networks and Rauch product's classification. Finally, the paper shows these findings could be the references for other economic organizations, which is aimed at the diminution of tariff rates.

Thus, there are many studies that support or oppose trade protectionism, especially the tariff instrument has a great impact on exporting countries of competitive products. Currently, there have not been many research publications related to analyzing the impact of trade protectionism through tariff instruments on Vietnamese exports using the GTAP model. The next content of the article will describe the model and results of studying the impact of tariffs on Vietnam's exports and GDP using the GTAP model.

3. Research Model and Results

3.1 Introduction of GTAP Model

To quantify the economic impact of AKFTA, the paper uses the Global Trade Analysis Project (GTAP) model. This is a general equilibrium model developed by Hertel (1999) of Purdue University, USA and widely used in the world. With a database of many regions around the world, the model provides an analysis framework to assess the impact of policies and changes in the structure of resource distribution by identifying policy beneficiaries and affected entities (Dimarana & Dougall, 2002; Todsadee et al., 2012).

The Global Trade Analysis Project (GTAP) Data Base provides a time series of snapshots of the global economy for each of four reference years: 2004, 2007, 2011, and 2014, with 2014 being the latest year added to GTAP 10 (Angel et al., 2019). The Data Base describes global bilateral trade patterns, international transport margins and protection matrices that link individual countries/regions. For each country/region, the Data Base presents values of production, and intermediate and final consumption of commodities and services in millions of U.S. dollars. The GTAP Data Base underlies the majority, if not all, of global general equilibrium models that are used to examine environmental and economic issues at the global level. The GTAP Data Base relies on country-based Input Output Tables (IOTs), and is supplemented by various international datasets as discussed below. In its tenth edition, the

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GTAP Data Base covers 121 countries and 20 aggregate regions of the world for each reference year. GTAP 10 includes updated IOTs for 50 countries, reflecting new cost structures and sales dispositions for each sector. According to Angel et al. (2019), in terms of sectoral coverage, GTAP 10 considers 65 products and services (this is the third GTAP sector classification, GSEC3), up from 57 in previous versions (GSEC2). In broad terms, GTAP classifies agriculture, food, resource extraction, manufacturing, and service activities to describe all economic activities in each country. GTAP 10 has more manufacturing and services sectors than previous versions). There are three new sectors in manufacturing, namely: Chemicals, Pharmaceuticals, and Rubber products, that were previously aggregated as a single "Chemical, Rubber, and Plastics (crp)" sector. We also now distinguish the Electrical Equipment sector separately from other machinery. In terms of services, the Data Base now represents Accommodations and Food Services, Warehousing, Real Estate Activities, Education and Health Services, which were previously included in aggregated Trade, Other transport, Other business and Other government services sectors, respectively.

The GTAP Data Base tracks reconciled bilateral trade data between countries. These trade data must be reconciled because the initial data are not balanced, i.e world exports differ from world imports, and, as well, there are frequent discrepancies between countries' reported imports and what their partners report as exports. GTAP merchandise trade data is based on the United Nations Commodity Trade (UN-COMTRADE) Statistics and the reconciliation treatment has been updated for all reference years using a new consistent methodology. The Data Base also accounts for how traded merchandise is delivered across countries using estimates of international transport margins. In GTAP 10, we use estimates based on reported values from a large set of countries with a sizable set of trading partners. This results in more variability of international transport margins by mode of transport (i.e., land, air and water) than in previous versions. The new estimates are based on data from U.S. imports of merchandise and North American Trans-border Freight Data, EUROSTAT trade data for European countries, and the Latin American Integration Association (ALADI) imports data (Nuno & Villoria, 2019).

According to Brockmeier (1996), the GTAP model has the following characteristics: First, representative consumers in each region or territory determine the amount of consumed goods, the level of savings, and the government spending to optimize the Cobb-Douglas utility function; and the government is part of the model. Second, representatives in each sector of each region or territory determine production inputs (land, capital, skilled and unskilled labor, natural resources) and intermediate goods (domestic goods and imported goods). Intermediate goods is disaggregated from the factor of production in the production function; therefore, its price does not affect production inputs. Intermediate goods includes imported goods and domestically produced goods. Parameters of the elasticity of substitution are determined before being included in the model. Third, the prices of goods and production inputs are determined so as to keep the balance between demand and supply in the market. The GTAP model also has some disadvantages: The model is static, so it is not possible to

analyze the transition between two equilibria. Without financial markets in the GTAP model, it cannot deal with issues related to exchange rates, interest rates, and inflation, as well as the effects of monetary policy.

By imposing taxes and subsidies on basic goods and inputs, the government creates the difference between the price that buyers pay and the price that producers get. Policy interventions are modeled in the form of: ad valorem taxes, taxes and subsidies or quantitative restrictions like in textile trade. International trade links are included in the model through the replacement of Armington by goods that differ in the country of origin. Therefore, in the commodity market, buyers distinguish domestically produced products from imported products with the same use. Imported products differ in their regions of origin, leading to two-way trade between different regions for tradable products (Figure 1).
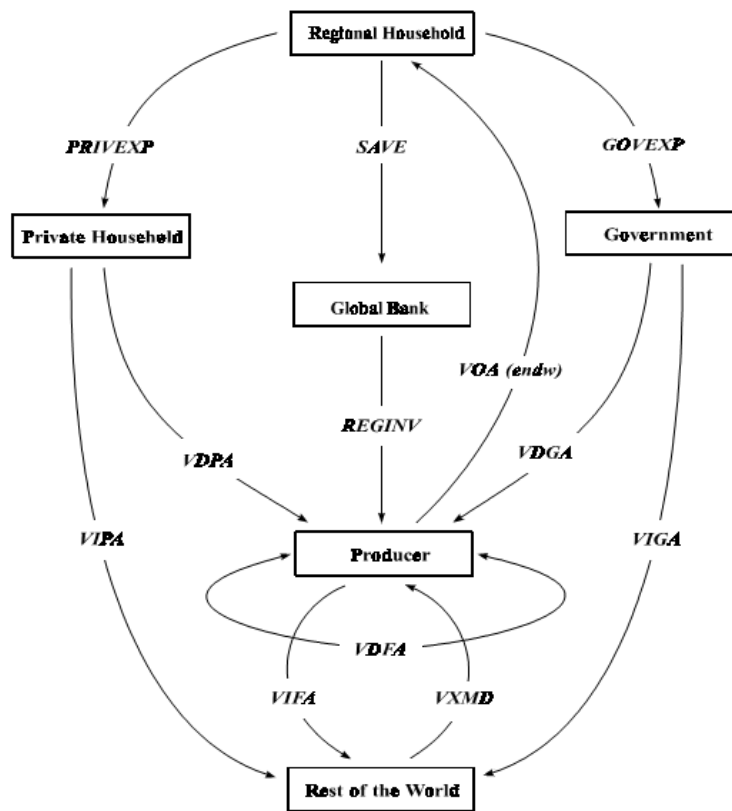
Figure 1. Multi Region Open Economy without Government Intervention

The global model is a CGE model with a multi-sector structure. The global model has its own characteristics, being a multi-region model that covers many countries in which:

- The database is "global", i.e. based on I/O tables (or SAMs) of many countries (calibrated to ensure consistency and reduce differences in data collection time and sector division manners of each country).
- The model is very suitable for analyzing individual countries in a global context;

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- The model is built-in so that each user does not have to build, but can apply it to the analysis according to his own purposes.

However, the model also has certain disadvantages:

- Because the model's data is from many countries with differences in time and structure, the consistency are not high (though be calibrated).
- Since the global model is quite complex, it takes a lot of effort for users to understand and apply.

Basic inputs and semi-finished products are two types of production inputs. In each region, to produce a fixed volume of output, it is assumed that each industry uses a combination of both inputs to minimize total costs. The 3-level production technology limits the industry's choice of inputs. At level 1, the semi-finished products and basic inputs are used at a fixed rate according to the Leontief production function. At level 2, semi-finished products are a combination of imported and domestically produced goods with the same input-output designation. The package of basic production inputs includes labor, capital, and land. In both cases, the sum function takes the form Constant Elasticity of Substitutability (CES). At level 3, the import package formed by the CES function includes imports with the same name from different regions.

Each region in a GTAP model has a representative household that receives all of the area's income. This household's total income is divided into constant household consumption, government spending, and national saving. The household buys packages of goods to optimize use value within the limits of household spending. The constrained budget optimization behavior of the household is modeled using the Constant Elasticity Difference (CDE) demand function. The CDE function is not as general as the CES function and the Linear Expenditure System (LES), but make it more flexible and easier to adjust the price and income elasticity of consumption in each region. The package of consumable goods is the CES function combining both imported goods and domestically produced goods, in which imported goods are the CES function of imported goods from different regions.

The ratio of government spending to income for each region is kept constant. Government spending is allocated to goods according to a Cobb-Douglas distribution function. Total expenditure on domestically produced good and imported goods is based on a combination method such as the allocation of household spending on this good. Investment in each region is financed by global savings. Each sector contributes a fixed percentage of income to total savings. Total savings can be allocated in two ways. The first way is that the allocation to each region will increase by the rate of increase in total savings. The second way is that the investment will be amortized according to the relative return. Regions with rising yields relative to the global average will receive a larger share of investment while regions with declining yields relative to the global average will receive a lower share of investment.

Each region has 5 types of production inputs, including 2 types of labor (skilled and unskilled), a homogeneous capital good, land and natural resources. In a typical closed model, the total supply of labor and land is fixed for each region, but capital can move across borders to equalize the rate of

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return. In other words, the inputs are clearly distinguishable into perfect mobility and sluggish adjustment. Mobile inputs earn the same market rate of return regardless of the place of use. Slowly adjusting inputs can have different equilibrium rates of return by sector. At this time, the research will consider the most suitable functions for the purpose of analysis. After each equation (=) representing the market equilibrium, the index variables represent the group of variables in quotation marks () and their values.

With tax cuts in region s, qxs (exports from r to s) can increase, which means that output (qo) in region s will increase. The higher the export to output ratio and (SHRXMD) the higher the export growth rate (qxs), the higher the output. Depending on the magnitude and sign of changes in domestic consumption (qds) as well as the ratio of domestic consumption to output (SHRDM), output can increase or decrease. Domestic consumption and the share of imports together with a change in imports (qxs) cause a change in output as described by the following equation for the equilibrium of industries:

$$qo(i,r) = SHRDM(i,r) * qds(i,r) + sum(s,REG, SHRXMD(i,r,s) * qxs(i,r,s)) + tradslack(i,r);$$
$$(where\ i: Sector;\ r: Region;\ s: Destination) \tag{1}$$

In the above equation, the market price level will change to ensure that the change in real output equals the sum of the changes in domestic consumption and exports. Therefore, changes in the price and quantity of output can be explained by (1).

Equation (2) below establishes the relationship between the price of imported goods by region (pms) and the total price of imports (pim), total imports (qim) and exports by source (qxs). Elasticity of Armington (ESUBM) affects the degree of price effect on exports. The reduction of tax on goods imported from source r will reduce the price of goods imported from region r (pms). If source r is important in terms of total trade to region s, then the tariff reduction also reduces total imports (pim). the price difference between the r and s regions relative to the total price in the s region will essentially produce a substitution effect, represented by the group in equation 2, multiplied by the ESUBM. Total imports into region s (qim) show us the domestic market penetration effect or the magnitude of the increase in total imports of region s. The variable ams (increase in imports due to changes in technology imported from region r into s) represents the change in technology in region r with the significance of increasing exports to region s. Although this can be interpreted and expressed in different ways for many different research purposes, this variable was not used in this study.

$$qxs(i,r,s) = -ams(i,r,s) + qim(i,s) - ESUBM(i) * [pms(i,r,s) - ams(i,r,s) - pim(i,s)] \tag{2}$$

Value added in the GTAP model is an aggregate function consisting of many commodities or endowments—labor, land, capital and natural resources. Although most changes in added value (qva) and price (pva) are mainly due to changes in output (qo and pm), the demand for each factor is determined by qva then pva.

Equation (3) below shows this relationship. If the price of the avaliable goods (pfe) is higher than the price of the value added, the demand for this goods will be lower, assuming substitution elasticity

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ESUBVA for the CES function unchanged. In addition, any increase in total value added will directly translate into an increase in demand for available goods. This is how the demand for labor or employment for each industry is established, for both skilled and unskilled workers. Technological change in the use of the basic factor i in industry j in the region r(afe) can have a negative or positive effect on demand for this factor through price. Changes in wages for both skilled and unskilled workers are directly affected by changes in overall output market prices (pm) as well as changes in taxes on labour.

$$qfe(i,j,r) = - afe(i,j,r) + qva(j,r) - ESUBVA(j) * [pfe(i,j,r) - afe(i,j,r) - pva(j,r)] \quad (3)$$

In this model, welfare is estimated via Equivalence Variation (EV). Welfare is broken down into different components; the most important is allocative efficiency, terms of trade and changes in capital goods prices necessary to maintain the investment-savings balance.

Simulation description: Shock, close and result. To close the model, we assume full employment, perfect competition, and equilibrium in all markets. The outcome of the GTAP model should not be seen as annual growth but as a change over a period of several years.

3.2 Analysis of the Impact of Tariffs on Vietnam's Imports and Exports according to the Gtap Model

In analyzing models and recommending policies, the article focuses on analyzing the impact of US tariffs on Vietnamese exports to the US, mainly agricultural exports. This is because Vietnam's agricultural exports to the US and Europe account for a large proportion, which is vulnerable when the US imposes import tariffs.

➕ *Impact of tariffs on the export of Vietnamese goods in general on the US, EU, and China*

Calculations using the GTAP 10 model show that the US increase of 5% import tax on all goods from Vietnam will sharply reduce exports to the US (Table 1), but tend to increase exports of Vietnam to other markets such as China and the EU. Some groups of export goods with strong growth in China and EU markets include: Rice, Meat and livestock, Light Industry, Utilities, Construction and Other Services. For the US, exports of goods from Vietnam to the US market decrease sharply for such items as: Rice, Mining products, Textiles, Heavy industry, Meat and livestock. Even so, the decrease in exports to the US is still larger than the increase in exports to other markets, while the US is Vietnam's largest export market. In general, Vietnam's exports are still negatively affected by trade protection measures from other countries.

➕ *Impact of tariffs on imports of foreign goods into Vietnam*

Table 2 shows the impact of the US increasing 5% import tax on goods that Vietnam imports from some markets of China, the US and the EU. Contrary to the export trend, the fact that the main export market is the US, increasing import tax on Vietnamese goods not only reduces Vietnam's imports from the US but also reduces Vietnam's imports from other countries such as China and the EU. The reason may be that Vietnam has to import most of its intermediate inputs and raw materials from abroad to produce exports. Therefore, an increase in import tax on Vietnamese goods will also reduce the import of Vietnamese goods. Groups of goods imported into Vietnam falling sharply include: rice, meat and

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livestock, utilities, construction, transportation, communication and other services. The group of imported goods with little impact is heavy industry.

Table 2. Impact of the US 5% Increase in Import Tax on Goods that Vietnam Imports from Some Markets (%)

Items	China	USA	EU
Rice	-5.26	-5.5	-5.29
Cereals, other crop products	-1.48	-1.59	-1.49
Meat and cattle	-3.01	-3.19	-3.02
Seafood	-1.98	-1.97	-1.97
Mining products	-2.08	-2.16	-2.07
Processed foods	-2.68	-2.8	-2.69
Textile	-5.39	-5.7	-5.39
Light industry	-2.56	-2.73	-2.56
Heavy industry	-0.52	-0.68	-0.53
Utilities, construction	-3.95	-4.05	-3.96
Transport, communication	-4.51	-4.59	-4.51
Other services	-4.45	-4.53	-4.45

Source: Author's caculations based on GTAP model.

3.3 Impact of Tariffs on Vietnam's Agricultural Exports to the US, EU and China

According to the most updated data from the GTAP10 model, Vietnam's rice export tax to the EU market is very high (39%), then to Southeast Asia and Africa (nearly 5%). Meanwhile, import tax from the US and China is 0%. Grains and other crop products have relatively low tariffs in the US, China and EU markets, while they are very high in South Asia and East Asia. The two groups of meat and livestock and aquatic products have import tax of 3.28% in the EU market, but are quite low in the US and China, although quite high in some other markets (South Asia and East Asia).

Table 3. Export Tax Rates of Vietnam's Goods to International Markets

Nation	Rice	Cereals, other crop products	Meat and cattle	Seafood
Oceania	0	0.05	1.3	0
China	**0**	**0.485**	**0**	**0**
East Asia (excluding China)	0	23.2	1.13	5.28
Other Southeast Asia	4.99	0.1	0.419	0.01
South Asia	0	62.5	10.2	20.2

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America	**0**	**0.019**	**0.03**	**0.287**
North America (excluding US)	0	6.15	1.18	0.166
Latin America	0	11.8	0.089	7.2
EU	**39**	**0.062**	**3.28**	**3.6**
Middle East and North Africa	0	12.8	2.28	3.1
Sub-Saharan Africa	4.44	4.76	0.097	2.15
Other countries	3.72	0.652	9.82	3.38
Total	52.2	123	30.3	45.4

Source: Author's caculations based on GTAP model.

With the current tax rates as above, the imposition of 5%, 10% and 15% tax rates on agricultural products will have an impact on Vietnam's exports to a number of markets as follows:

For rice: Because the import price of the US and China for Vietnamese rice is at 0%, the imposition of import tax will negatively affect Vietnam's rice exports to these markets. The higher the tariff, the greater the drop in exports. Specifically, with the tax rate of 5%, 10% and 15%, Vietnam's rice exports to these two markets will decrease by 50.5%, 101% and 151.5%, respectively. Meanwhile, because the EU's import tax on Vietnamese rice is very high in the base scenario of 39% (2014 data), the imposition of import tax at 5%, 10% and 15 % will positively affect Vietnam's rice exports to the EU, with an increase of 247.16%, 210.86% and 174.55% respectively.

For the group of cereals and other crop products (except rice): Since the import tax of the US, EU and China on these products of Vietnam is currently quite low, the import tax is imposed at 5 levels. %, 10% and 15% will negatively affect the export of this group of goods of Vietnam to the above markets. Specific reductions are given in Tables 4 and 5.

For meat and livestock products: The US and China's import tax on Vietnam's meat and livestock products is quite low, at 0.5% and 0% respectively, while imports from the EU are higher (3.28% in the data reviewed). Therefore, the imposition of import tax will negatively affect Vietnam's seafood exports to the US and China, and seafood exports to the EU. Specific reductions are given in Tables 3 and 4.

For seafood products: Similar to meat and livestock products, the import tax of the US and China on Vietnam's seafood group is quite low, close to 0%, while imports from the EU are higher (3.6% in the data considered). Therefore, the imposition of import tax will have a very negative impact on Vietnam's seafood exports to the US and China, and seafood exports to the EU. Specific reductions are given in Table 4.

Table 4. Impact of Tax Imposition on Some Agricultural Products on Vietnam's Exports to Some International Markets

Product/Country	Tax level 5%	Tax level 10%	Tax level 15%
Rice			
US	-50.5%	-101%	-151.5%
EU	+247.16%	+210.86%	+174.55%
China	-50.5%	-101%	-151.5%
Cereals, other crops			
US	-21.12%	-42.32%	-63.53%
EU	-19.36%	-38.96%	-58.56%
China	-19.52%	-41.13%	-62.75%
Seafoods			
US	-11.59%	-23.88%	-36.17%
EU	-3.32%	-15.18%	-27.03%
China	-12.32%	-24.64%	-36.96%
Meat and livestock			
US	-32.54%	-68.73%	-104.91%
EU	-12.3%	-47.97%	-83.63%
China	-37.04%	-74.08%	-111.12%

Source: Author's calculation based on GTAP model.

✦ *Impact of the US-China trade war on Vietnam's agricultural exports*

The US-China trade war, although not directly affecting Vietnam's agricultural exports, can have an indirect impact through trade protection. As US agricultural products suffer heavy damage, the tendency to protect US agricultural products through measures such as export subsidies or import restrictions will tend to increase. Meanwhile, agricultural exports to China may benefit as China shifts to importing from other markets. In addition, there will be indirect effects through foreign income. As the US-China trade war tends to negatively affect global trade and economic growth, the demand for agricultural products in many countries may decrease.

The research author's calculations from the GTAP 10 model show that the US-China trade war has a very negative impact on Vietnam's agricultural exports to the US, reflecting the trend of increasing export subsidies and restricting imports of US agricultural products due to a decrease in agricultural exports to China. Meanwhile, Vietnam's agricultural exports to China benefit, as China shifts to import from Vietnam. In addition to the positive impact on agricultural exports to China, agricultural exports to most other markets decrease. That shows that the US-China trade war has a negative impact on Vietnam's agricultural exports.

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Table 5. Impact of the US-China Trade war on Vietnam's Agricultural Exports by Market

(% change)

Groups	China	US	EU_28	Southeast Asia	ASEAN	South Asia	Ocenia	Nothern America	Lantin America	Middle East and Nothern Africa	Subsahara and Africa
Rice	-18.7	15.06	-8.05	-13.19	-10.34	-9.41	-10.64	-17.92	-9.36	-10.45	-5.79
Cereals, other crop products	13.71	-4.98	-2.78	-7.04	-4.19	-2.73	-3.33	-9.39	-4.05	-3.2	-3.27
Meat and livestocks	1.14	-3.29	-5.14	-8.51	-5.62	-11.03	-6.47	-7.12	-4.72	-5.55	-6.25
Seafoods	-6.5	-4.63	-4.93	-6.41	-4.58	-5.13	-5.17	-7.87	-4.62	-5.03	-4.89
Processed foods	-4.75	-2.5	-4.25	-5.83	-4.81	-3.68	-4.74	-2.74	-3.5	-4.63	-4.49
Textile	-3.82	35.1	-0.48	-7.7	-5.05	-4.49	-7.01	-0.97	-1.63	-3.22	-5.9
Others	-8.19	-9.98	-9.05	-9	-8.95	-8.81	-9.18	-4.6	-8.44	-9.85	-9.46

Source: Author's calculation based on GTAP model.

The simulation is performed by taking the average export tax increase shock from China to the US by 19.3% and from the US to China by 21.7% (the tax increase calculated by the Peterson Institute for International Economics).

⚜ *Impact of protection due to the trend of increasing agricultural productivity*

Due to China's trend of trade protectionism and competition from countries in the region, Vietnam is facing stiff competition from agricultural products from other countries, typically fruit and vegetable competition with Thailand and the Philippines; rice with Thailand; rubber with Indonesia, Malaysia, etc.

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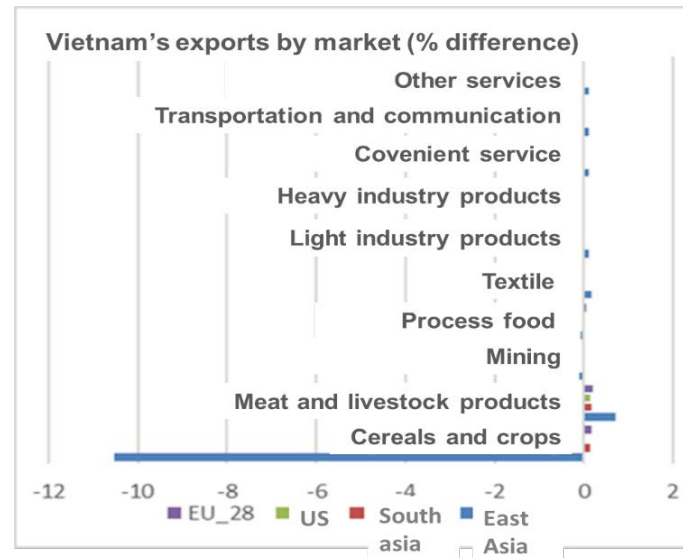
Figure 2. Impact of 10% Increase in Grain and Crop Productivity in Other East Asian Countries on Vietnam's Merchandise Exports

Source: Author's calculation based on GTAP model.

The author's calculations from the GTAP 10 model (2019 data) show that if the productivity of unskilled labor in the agricultural grain and crop production sectors in other East Asian countries increases by 10%, imports of grain in East Asian countries will decrease significantly. In that context, Vietnam's exports of grain products to the East Asian market will be most negatively affected, down 10.52% compared to the base scenario. This reflects the negative impact of technological progress in other countries if Vietnam does not make improvements in productivity. Exports of this group of agricultural products to the US market are also negatively affected, but not significantly, while exports to the EU may increase 0.16%. Exports of other agricultural products of Vietnam including livestock and meat products to markets tend to increase slightly, possibly due to lower livestock input prices. Other industries are not significantly affected.

4. Conclusions and Policy Recommendations

The context of trade protectionism is returning after the Covid-19 pandemic, the US-China trade war and the trend of increasing the application of non-tariff barriers, posing many potential risks to Vietnam's exports, especially especially in important markets such as the US, EU, Japan, and China. The above context has brought Vietnam the risk of facing lawsuits and trade protection investigations, especially with seafood and agricultural exports. Therefore, in order to protect exporting enterprises against risks from trade protectionism, the State needs to take measures to support enterprises to raise their awareness and capacity to respond to non-tariff trade protection measures. In addition, strengthen the application of trade remedies to protect domestic production; to step up production in chains,

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standardize production processes, improve the quality and added value of exported products, to meet the requirements of importing countries; at the same time diversifying markets, promoting exports to other potential markets to achieve a more sustainable export demand. As analyzed above, the article focuses on analyzing the impact of the US imposing tariffs on Vietnam's exports to the US, mainly agricultural exports. This is because Vietnam's agricultural exports to the US and Europe account for a large proportion, which is vulnerable when the US imposes import tariffs on Vietnamese exports. Thus, some policy recommendations for Vietnam to mitigate the negative effects of trade protectionism by tariffs include:

Firstly, make better use of tariff preferences in newly signed FTAs. In the context of increasing trade protectionist trends, joining new generation agreements with major economic partners such as CPTPP, EVFTA and RCEP gives Vietnam many advantages to compete in the markets of other countries. Among the largest agricultural export partners of Vietnam today are the US, China, Japan and Korea, EU and ASEAN, Vietnam has FTAs with China, Japan and Korea, except the US. The average tax rate in Vietnam's FTA commitments is only from 0.5%, much lower than the average tax rate of 5-25% among WTO members. However, in order to enjoy the preferential tariff rates of the FTA, Vietnam's exports need to meet the rules of origin to determine the eligibility of imports to enjoy the preferential tax rates. Some of the main reasons why businesses have not taken advantage of tax incentives include: (1) Many businesses do not have a clear understanding of the rules of origin, or have not found a consultant; (2) Difficult to meet the rules of origin because the source of raw materials and accessories depends too much on a few sources outside the FTA; and (3) The procedures at the two ends of export - import are not convenient, not enough to compensate for the costs that businesses spend to enjoy incentives… Therefore, so that Vietnamese businesses can make better use of them. tax incentives, especially in new generation FTAs.

Secondly, ensure the quality requirements of exported agricultural products to enjoy tax incentives in signed FTAs. The US-China trade war has affected the export of Vietnamese goods to the Chinese market in general and agricultural products. Due to difficulties in exporting to the US market, China has boosted domestic consumption. This makes Vietnamese goods not only compete with goods of other ASEAN countries but also compete with domestic goods of China. Therefore, the Chinese market has changed, it is no longer as easy as before. China introduces more and more strict and strict quality criteria, regulations and standards on food safety and traceability for imported goods, causing difficulties for Vietnamese goods. The tariff reduction to 0% for nearly 8,000 product lines under the ASEAN-China Free Trade Agreement is expected to create a "bump" for Vietnamese agricultural products to grow in exports to China. Therefore, to meet China's requirements to enjoy tax incentives, Vietnam needs to improve and standardize the production process of agricultural products for export, in addition to meeting the origin of goods.

Thirdly, reduce the risk of tax increases in foreign markets. The escalation of the US-China trade war due to trade protectionism and strategic competition between the two countries can help Vietnam

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benefit by filling the trade gap in the US after Chinese goods were imposed by very high tax rate in this market. In the context of the US increasing trade protectionism, the rapid increase of Vietnam's trade surplus with the US also makes Vietnam very easy to fall into the sights of US trade agencies. In the coming time, Vietnam needs to take appropriate countermeasures to avoid being included in the list of currency manipulators by the US in order to avoid trade remedies that the US may apply to Vietnam. First of all, it is necessary to avoid exchange rate interventions that may be perceived by the United States as a currency manipulator. Changes in exchange rate policy could cause a deceleration in Vietnam's economy, as Vietnam is heavily dependent on exports, while exports are very sensitive to exchange rate fluctuations. In addition, both enterprises and state management agencies must take drastic measures to prevent the evasion of Vietnamese origin from foreign goods that have been mentioned in recent times. Enterprises need to strictly comply with regulations on certification of origin and not abet origin frauds and evade defensive measures. Agencies managing the agricultural sector also need to support businesses with information on how Vietnamese goods in their respective industries are being exported to other countries.

Fourthly, mitigate the impact of tariffs on economic growth and exports. The fact that countries increase trade protectionism in general has a negative effect on Vietnam's economic growth and exports, not only through measures to impose tariffs directly on Vietnam's exports, but also on indirectly through imposing tariffs on other countries, such as in the case of the US-China trade war, which reduces the demand for domestic agricultural products of the taxed countries. Therefore, to limit the negative impact of tariffs on Vietnam's economic growth and agricultural exports, it is necessary to boost exports to markets through other measures such as reducing trade and logistics costs. According to the World Bank (2021), tariffs account for only 1/14 of the average cost of trade, and most trade costs are incurred in transportation and logistics as well as cumbersome trade procedures and processes at the border and behind the border.

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