Optimal Tariff and Endogenous Drivers for Trade Liberalization*

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Abstract: *Trade liberalization requires institutional coordination and openness, and is driven by a multitude of factors. This paper simulates endogenous optimal tariffs under different model structures to uncover the underlying drivers of trade liberalization. Parametric calibration and simulation methods based on the numeric general equilibrium model are employed to estimate the optimal tariff rates of countries with and without trade retaliation. Then, near-reality assumptions are added into the standard general equilibrium model structure, including the cross-border capital flow, multi-country assumption and trade cost, to simulate decreasing optimal tariff rates. The simulation results suggest that world economic development has increased the economic ties and interdependence among nations, making trade liberalization an endogenous optimal choice. The backlash against globalization in recent years is motivated by short-term factors, but will not persist in the long run since it goes against the law of economic growth and socio-economic development.*

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1. Introduction

Over the past decades, trade liberalization has made tremendous progress, as evidenced in the rapid growth of world trade and investment. After the global financial crisis of 2008, a new wave of trade liberalization has been on the rise. Negotiations on WTO agreements and multilateral and regional trade agreements have focused on the creation and harmonization of trading systems and rules. Despite the backlash against globalization in a few countries or sectors, the trend towards trade liberalization is irreversible. Trade liberalization is driven by economic interest as countries stand to gain from trade openness. Yet many questions remain. How to explain for the twists and turns that occur in trade liberalization now and then? Why a financial or economic crisis breeds protectionism? Existing studies provide scant theoretical and empirical explanations and demonstrations on these questions.

The WTO and multilateral and regional trade agreements have played an irreplaceable role in trade liberalization. Yet such external driving forces are not the fundamental factor. Given the history and reality of trade growth, we put forward the following proposition on the underlying mechanism

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behind trade liberalization: Trade liberalization is driven by the need of countries to gradually and continuously open up their markets as they become more involved in the international division of labor and economically interdependent on each other. Based on such rationale, this paper creates a theoretical model and conducts numerical simulation to demonstrate theoretical and empirical evidence on the drivers behind trade liberalization at the normative level.

Based on the numerical general equilibrium theoretical model, we calculate the optimal tariff rates for various countries and gradually include more factors and assumptions approximate to real-world scenarios to simulate decreasing optimal tariff rates, and find that the closer to reality the model structures are, the lower endogenous optimal tariff rates will become. Since decreasing optimal tariff rates represent a country's tendency towards trade openness, our findings prove the endogenous driving forces behind trade liberalization.

Recent years have seen a backlash against globalization. After the global financial crisis of 2008, the "Occupy Wall Street" movement has been launched against large financial institutions for breeding moral hazard and causing the government to splurge taxpayers' money on bailouts. From the Brexit to Trump's election as US president, "de-globalization" has escalated into a new stage. After taking office, the Trump administration has enacted a slew of economic and social policies that run counter to globalization. President Trump has called upon his people to "buy American goods and hire American workers," Under his administration, the United States has scrapped the Trans-Pacific Partnership (TPP), re-negotiated the North American Free Trade Agreement (NAFTA), and threatened to withdraw from the World Trade Organization (WTO). Under a protectionist doctrine, the Trump administration has blatantly waged trade wars with China, Mexico, Canada, the European Union, among other economies. His administration refused to provide environmental public goods by pulling out from the Paris climate deal. He also imposed a Muslim ban, and ordered the construction of a border wall against Mexico. Why did advanced economies led by the US turn from proponents of globalization into anti-globalization advocates? How will the future trend unfold? We believe that anti-globalization is a suboptimal choice for some countries in the aftermath of financial and economic crises, but the endogenous drivers behind trade liberalization will remain. Based on a theoretical and empirical analysis of endogenous drivers behind trade liberalization, this paper uncovers the possible reasons behind the backlash against globalization.

In terms of the specific modeling and analytical methodology, this paper first creates a general equilibrium model to simulate the optimal tariff rates of countries. Then, other elements are included in the model framework step-by-step, including the production process, cross-border capital flow, multi-country model and falling trade cost. Reality specifications and inclusion of new considerations will lead to further reduced optimal tariff rates. The implication is that trade liberalization is driven by ever-closer economic ties and deepening interdependence.

2. Literature Review

Trade liberalization is closely associated with the optimal tariff rate. When the optimal tariff rate is high, a country tends to seek trade protectionism, and vice versa. By including near-reality assumptions into the standard general equilibrium model structure, this paper arrives at continuously falling optimal tariff rates to analyze and interpret the endogenous drivers behind trade liberalization. Therefore, exploring the model structure's impact on optimal tariff rates lies at the heart of analysis in this paper. Most referenced studies focus on the optimal tariff rates and their determinants and were conducted by academics outside China.

Most studies on optimal tariff rates are based on the analysis of theoretical models. Graaff (1949), Johnson (1953-1954), Gorman (1958) and Kuga (1973) offer analyses of optimal tariff rates based on two-country pure exchange models, and derive the reciprocal of optimal tariff rates equal to export

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supply elasticity. Eaton and Grossman (1985) analyze the optimal tariff rates under imperfect market competition. Kennan and Reizman's (1988) theoretical analysis finds that large countries tend to win tariff wars and set higher tariff rates. By incorporating production and consumption into consideration, Lapan (1988) uncovers optimal tariff rates. After introducing political factors into consideration, Grossman and Helpman (1995) offers an analysis of trade protectionism and calculates noncooperative and cooperative optimal tariff rates. Syropoulos (2002) examines the impact of monopolistic power and country size on optimal tariff rates.

Most empirical studies calculate optimal tariff rates based on the numerical simulation method. The following is a list of representative studies by the temporal sequence: Hamilton and Whalley (1983) is the earliest study that employs the numerical general equilibrium calibration and simulation method to calculate optimal tariff rates. With the example of the United States and Canada, Markusen and Wigle (1989) simulates two-way optimal tariff rates with the numerical method, and analyzes the impact of country size, economies of scale and capital flow on the Nash equilibrium tariff rates. Based on the numerical simulation method, Perroni and Whalley (2000) calculates the Nash equilibrium tariff rates after trade retaliation, and assesses the impact of regional trade agreements on trade liberalization based on optimal tariff rates. Following the numerical simulation method, Ossa (2011) calculates the noncooperative tariff rates under the new trade theory structure, and offers an analysis of WTO negotiations. Whalley *et al*. (2011) and Yu and Zhang (2011) simulate the optimal tariff rates of individual countries based on the "inside money" trade disequilibrium model. Ossa's (2014) new trade theory model that incorporates political and economic factors simulates optimal tariff rates, equilibrium tariff rates after trade retaliation, and equilibrium tariff rates after trade negotiation.

3. Model Specification, Data and Method for Stimulating Optimal Tariff Rates

In this section, we create a general equilibrium model framework to explain the numerical model' s data source and treatment, parametric calibration and optimal tariff simulation.

3.1 Basic Model Structure

This paper employs different model structures to simulate the optimal tariff rates, including the general equilibrium model under the Armington assumption[1] structure for the two-country heterogeneous product, and introduces the cross-border capital flow model, multi-country model, and multi-country model with trade cost. Except for the pure exchange framework, all these models simultaneously include consumption and production. The following shows basic model specifications, and all specific framework structures are based on the basic model.

We specify a global general equilibrium model system that contains N countries each manufacturing two types of product (manufacturing sector product and non-manufacturing sector product) with two factors (capital and labor), and that both factors may flow across sectors but not across countries. We assume that manufacturing sector product is tradable but non-manufacturing sector product is non-tradable. On the production side of the model, we assume that the manufacturing technology for each product from each country is a constant elasticity of substitution (CES) production function. On the consumption side, we follow the Armington assumptions of homogeneous product by country and heterogeneous product by country, respectively. In any case, we specify the utility function as the CES form. Following the Armington assumption of heterogeneous product by country, there can be the

[1] Armington assumption means that the same product manufactured by different countries is heterogeneous with certain substitution elasticity.

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second consumption structure for tradable manufacturing sector product from different countries.[2] Some model structures may introduce the cost of trade between both countries, including import tariff and nontariff barriers. Model equilibrium conditions include factor market clearing, product market clearing, trade clearing, the condition of zero profit production, among others.

3.2 Data and Parametric Calibration

Based on the actual data of 2013, we create a global general equilibrium numeric model, and conduct a parametric model calibration following Shoven and Whalley's (1992) method. Our model framework includes a two-country structure and a multi-country structure. The two-country structure includes three country pairs, including "China-ROW (Rest of the World)," "US-ROW" and "EU-ROW." The multi-country model includes seven countries, i.e. China, the US, the EU, India, Japan, Brazil and ROW.

All the actual production and consumption data for the general equilibrium model are from the World Development Indicators (WDI) database. For the two types of product, we assume that secondary industry (manufacturing) churns out manufacturing sector product, and that the primary and tertiary industries (agriculture, and mineral extraction, land reclamation and service sector) provide non-manufacturing sector product. We employ the shares of agriculture and service sector in GDP and GDP data to calculate the output of manufacturing sector product and non-manufacturing sector product, the total labor income (wage) of various sectors to measure labor factor input, and calculate capital and labor input data based on the capital-to-output ratio. ROW data are obtained by subtracting the values of all countries other than ROW from the global value. The source of countries' trade data is the United Nations Comtrade database. ROW import and export volumes are calculated by subtracting the total export and import volumes of individual countries from the import and export volumes of all other countries. For the trade equilibrium model, import data are adjusted with export data, so that the two are equal to each other. The total consumption of countries can be calculated with output and trade data.

In the model, trade cost consists of import tariff and non-tariff barriers. The source of countries' import tariff data is WTO tariff database. ROW's tariff rate is expressed by the world average tariff rate. The level of non-tariff barrier can be obtained by subtracting import tariff from the trade cost. It is hard to estimate the product consumption substitution elasticity and the production factor substitution elasticity, for which no estimate values can be found from existing literature. Referencing Whalley and Wang's (2010) method, this paper specifies these elasticities as 2. Of course, there is some randomness to such specification. To avoid possible error, we will conduct a sensitivity analysis of the elasticity values in the simulation. Trade cost is estimated with Novy's (2013) method. The principle for such estimation is to standardize the ratio between two-way trade flow and local trade flow and use estimation parameters to denote all trade barriers.[3]

With such data, we may calibrate the parameters in each model structure. Data for solving the model may then generate benchmark data to obtain the model's equilibrium values. Then, we use these parameters to create a numeric global general equilibrium model to simulate optimal tariff rates.

3.3 Method for Simulating Optimal Tariff Rates

Referencing Hamilton and Whalley (1983), we estimate the two different optimal tariff rates. One is non-retaliatory tariff rate, i.e. one-time optimal tariff rate, when no other country retaliates. The other is retaliatory optimal tariff rate, i.e. the equilibrium optimal tariff rate reached after rounds of one country

[2] Since non-manufacturing sector product is specified as non-tradable product, there is no second-level consumption of the product from a different country.

[3] This method for trade cost calculation offers the advantage of convenience and requires limited data. Data required in this paper include trade cost for different pairs of countries. Compared with econometric estimation, this method may simplify the otherwise complicated calculations.

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adopting the optimal tariff rate and another country seeking optimal retaliation, and the latter is the non-cooperative Nash equilibrium tariff rate.

The optimal tariff rate simulated in this paper differs from the actual tariff rates of a country by a wide margin mainly because the model is highly hypothetical. As a matter of fact, the purpose of this paper is to analyze the impact of various factors on the optimal tariff rate rather than to explore the actual tariff levels. Therefore, the results of model simulation are not comparable to real-world tariff rates. With the inclusion of more realistic assumptions, the optimal tariff rates estimated in this paper become increasingly approximate to real tariff levels.

4. Two-Country Armington Standard Model and Optimal Tariff Rate

Traditional theoretical models for optimal tariff rates are established under the standard two-country pure exchange general equilibrium framework structure. Hence, we set out to simulate the optimal tariff rate under the two-country standard model as a benchmark for subsequent study, and then compares with the simulation results with the inclusion of near-reality factors. Our model structure contains three specifications: (i) a basic two-country, one-product pure exchange economy under given product endowment without production structure; (ii) a two-country, one-product economy with production structure; (iii) a two-country, two-product economy with production structure. Under the Armington's assumption of two-country standard model structure, we may analyze the impact of production structure on the optimal tariff rate by comparing the optimal tariff rates estimated with the models with production structure and the model with pure exchange structure.

For the one-product structure, the output is a country's economic aggregate. For the two-product structure, the output can be divided into manufacturing sector product and non-manufacturing sector product. In addition, all models have introduced the Armington assumption of heterogeneous product by country with a substitution elasticity. Specifically, the pure exchange model is a "two-country, single product" structure, and the models with production structure include a "two-country, single-product, two-factor" structure and a "two-country, two-product, two-factor" structure. "Two-country" includes three different country pairs: "China and ROW," "US and ROW" and "EU and ROW." "Two-product" refers to manufacturing sector product and non-manufacturing sector product. "Two-factor" refers to capital and labor. Numerical models thus created simulate non-retaliatory and retaliatory optimal tariff rates. Table 1 presents the results of the simulation.

According to the results, the optimal tariff rate simulated with the model that contains production structure is lower than that simulated with the pure exchange structure, and the addition of product type will also reduce the optimal tariff rate. However, the inclusion of production structure and product type has a limited impact on the optimal tariff rate: Although the gap is evident, the differential value is small. Furthermore, optimal tariff rates are higher in countries with larger economic aggregate. There is not much difference between non-retaliatory optimal tariff rate and retaliatory tariff rate, and retaliatory optimal tariff rate is generally smaller.

Take the "US and ROW" pair, for instance, the US non-retaliatory optimal tariff rate is 106.2% under the "two-country, single-product" pure exchange model, which is higher than the 105.5% tariff rate under the "two-country, single-product" model that contains production structure and higher than the 102.5% tariff rate under the "two-country, two-product" model that contains production structure. ROW's non-retaliatory optimal tariff rate is 144.6% under the "two-country, single-product" pure exchange model, which is higher than the 140.5% under the "two-country, single-product" model that contains production structure and still higher than the 108.6% under the "two-country, two-product" model that contains production structure (see Table 1).

Analysis of optimal tariff under the two-country Armington product standard model offers a

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Table 1: Optimal Tariff Rates under the Two-Country Armington Standard Model (%)

Country	Non-retaliatory optimal tariff rate	Retaliatory optimal tariff rate	Non-retaliatory optimal tariff rate	Retaliatory optimal tariff rate	Non-retaliatory optimal tariff rate	Retaliatory optimal tariff rate
	2×2 - with CES production function		2X1 - with CES production function		2X1 - pure exchange	
	China - ROW		China - ROW		China - ROW	
China-	102.4	100.9	108.4	103.4	109.8	103.8
ROW	119.2	108.6	151.6	123.1	161.4	127.5
	US - ROW		US - ROW		US - ROW	
US-	102.5	101.1	105.5	102.2	106.2	102.5
ROW	108.6	103.6	140.5	116.7	144.6	118.4
	EU - ROW		EU - ROW		EU - ROW	
EU-	102.8	101.2	109.3	103.8	110.7	104.4
ROW	109.5	104.0	136.0	115.1	140.6	117.1

Note: (1) "2X1" denotes "two-country, single-product" general equilibrium model, and "2×2" denotes "two-country, two-product" general equilibrium model. (2) "China-ROW" denotes the pair of China and other regions combined; "US-ROW" denotes the pair of the US and other regions combined; "EU-ROW" denotes the pair of the EU and other regions combined.
Source: Calculated and compiled by the authors.

benchmark model framework, to which new assumptions can be added continuously. The above analysis finds that when production structure is added into the model framework, the optimal tariff rate will decrease to some extent.

5. Optimal Tariff Rate: Introducing Cross-Border Capital Flow

This section introduces cross-border capital flow into the "two-country, two-products and two-factor" model that contains production structure and Armington assumption to investigate the impact of cross-border capital flow on the optimal tariff rate. Two-country pairs still include "China-ROW," "US-ROW" and "EU-ROW." "Two-product" refers to the tradable manufacturing industry and the non-tradable non-manufacturing industry. "Two-factor" refers to capital and labor. Cross-border capital flow is introduced by allowing capital to freely flow between countries and industries,[4] which means that production capital factor may come from China or other countries. Similar to the standard model, labor factor may also freely flow between industries but not between countries.

Cross-border capital flow can be introduced more straightforwardly by assuming that capital is homogeneous and may flow between countries and that demand for capital factor as a production input may come from different countries. Demand for foreign capital as a production input can be denoted by FDI in different sectors to use such data for model calibration and employ the numerical model for simulating the optimal tariff rate. Table 2 shows the calculation results of optimal tariff under the model structure with cross-border flow of capital.

In comparing the optimal tariff rates under the model structures where capital may or may not

[4] Under the standard "two-country, two-product, two-factor" model structure, both capital and labor freely flow across industries, but cannot freely flow between countries.

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Table 2: Optimal Tariff Rates under the 2×2 Model with the Cross-Border Flow of Capital (%)

Country	Non-retaliatory optimal tariff rate	Retaliatory optimal tariff rate	Non-retaliatory optimal tariff rate	Retaliatory optimal tariff rate
	Capital flows across countries		Capital cannot flow across countries	
	China - ROW		China - ROW	
China	33.1	32.4	102.4	100.9
ROW	32.3	31.1	119.2	108.6
	US - ROW		US - ROW	
US	11.3	11.1	102.5	101.1
ROW	10.1	9.7	108.6	103.6
	EU - ROW		EU - ROW	
EU	21.4	20.5	102.8	101.2
ROW	18.0	17.2	109.5	104.0

Note: (1) "2×2" denotes "two-country, two-product" model structure, and "China-ROW" denotes the pair of China and other regions combined; "US-ROW" denotes the pair of the US and other regions combined; "EU-ROW" denotes the pair of the EU and other regions combined.
Source: Calculated and compiled by the authors.

move across borders, it can be found that the optimal tariff rate decreases significantly after the cross-border movement of capital by about 65%. Meanwhile, the cross-border flow of capital will change the impact of economic aggregate on the optimal tariff rate, i.e. the cross-border flow of capital has a more significant impact on the optimal tariff rate than does economic aggregate. In observing the net capital inflow and outflow's impact on the optimal tariff rate, we find that countries with a net capital outflow (surplus) have higher optimal tariff rates. Furthermore, the retaliatory optimal tariff rate is slightly lower than the non-retaliatory tariff rate.

Growing cross-border investment, FDI and capital flow suggest that the cross-border flow of capital has become inevitable. The above analysis explains that when the cross-border flow of capital is factored in, the optimal tariff rate will decrease substantially, i.e. countries become less motivated to seek trade protectionism. The reason is that when the cross-border flow of capital is taken into account, the home country's capital factor also contributes to the product of other countries, and foreign manufacturers become multinational firms also investing in the home country. Hence, the cross-border flow of capital will transform the home country's economic performance and social welfare and lead to a reduction in the optimal tariff rate since tariff protection not only harms foreign firms but the home country's firms operating in other countries by reducing their corporate income and return on capital.

Therefore, the increasing cross-border flow of capital will cause the optimal tariff rate to fall, underpinning trade liberalization. During an economic and financial crisis, the crisis-hit countries will see a reduction in their cross-border capital flow and a short-term rise in their optimal tariff rates to protect domestic industries. This reaction explains the backlash against globalization. After the economy recovers, trade liberalization will regain its momentum.

6. Multi-Country Model Structure and Optimal Tariff Rate

The section expands the two-country model structure into a multi-country one and seeks to analyze

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Table 3: Optimal Tariff Rate under the Multi-Country Model Structure (%)

Country	Non-retaliatory optimal tariff rate	Retaliatory optimal tariff rate	Country	Non-retaliatory optimal tariff rate	Retaliatory optimal tariff rate
	Multi-country model structure			Two-country model structure	
	China - ROW			US - ROW	
China	33.8	35.5	US	102.5	101.1
US	39.0	39.6	ROW	108.6	103.6
	China - EU			EU - ROW	
China	34.7	36.4	EU	102.8	101.2
EU	40.4	41.1	ROW	109.5	104.0
	China - ROW			China - ROW	
China	54.7	55.4	China	102.4	100.9
ROW	35.8	39.5	ROW	119.2	108.6

Source: Calculated and compiled by the authors.

the impact of the multi-country model on the optimal tariff rate. The multi-country model is a global general equilibrium model system encompassing the seven economies of China, the US, the UK, India, Japan, Brazil and ROW (the rest of the world). The model features a "multi-country, two-product, two-factor" structure with Armington's specification. Two-product refers to tradable manufacturing sector products and non-treatable non-manufacturing sector product. Two-factor refers to capital and labor. Production function is CES type, and utility function is embedded CES type. Factors may flow between industries but not between countries.

The optimal tariff rate, which is the equilibrium tariff rate reached after rounds of tariff retaliations between two countries, is generally accounted and formed between two countries. For the multi-country model, we still estimate the optimal tariff rate between two countries, and the two-country pairs are "China-US," "China-EU" and "China-ROW." Here, only the "China-ROW" pair is the same with country combination under the previous two-country structure, which nonetheless does not affect the comparison with the optimal tariff rate impact of the multi-country model framework. Table 3 shows the non-retaliatory and retaliatory optimal tariff rates obtained with the same simulation method.

A comparison of simulation results reveals that the optimal tariff rate under the multi-country structure is significantly lower than the optimal tariff rate under the two-country structure by about 50%. Take "China-ROW" pair for instance, the non-retaliatory tariff rates of China and ROW in the multi-country model are 54.7% and 35.8%, respectively. Under the two-country model, however, the non-retaliatory optimal tariff rates are 102.4% and 119.2%, respectively.

While the two-country model is hypothetical, the multi-country model reflects a realistic scenario. When the realistic multi-country structure is introduced, there will be significant reductions in the optimal tariff rates of all countries. That is to say, the introduction of the multi-country model structure will reduce the optimal tariff level.

7. Optimal Tariff Rates: A Multi-Country Model with Trade Cost Variations

In this section, we introduce trade cost into the multi-country model structure to analyze the

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Table 4: Optimal Tariff Rates: Multi-Country Model Structure with Trade Cost (%)

Country	Non-retaliatory optimal tariff rate	Retaliatory optimal tariff rate	Non-retaliatory optimal tariff rate	Retaliatory optimal tariff rate
	Multi-country model with trade cost		Multi-country model without trade cost	
	China - US		China - US	
China	39.4	40.8	33.8	35.5
US	51.2	51.6	39.0	39.6
	China - EU		China - EU	
China	40.4	40.8	34.7	36.4
EU	50.2	50.7	40.4	41.1
	China - ROW		China - ROW	
China	83.9	84.6	54.7	55.4
ROW	51.9	56.6	35.8	39.5

Source: Calculated and compiled by the authors.

impact of trade cost on the optimal tariff rates. Trade cost can be divided into tariff barriers and non-tariff barriers. While the former generates tax revenue, the latter does not. Aside from generating no tax revenue, non-tariff barriers consume physical capital to offset cost. The model assumes that an exporting country needs to consume non-tradable non-manufacturing sector product to cover the cost of non-tariff barriers, and that the value of non-manufacturing sector product consumed equals the cost of non-tariff barriers. Table 4 shows the results of optimal tariff simulation under the multi-country model structure with trade cost.

Simulation results indicate that the optimal tariff rates of the multi-country model with trade cost are slightly higher than those of the model without trade cost. Namely, optimal tariff rates are negatively correlated with trade cost. For the "China-US" pair, the non-retaliatory optimal tariff rates of China and the US are 39.4% and 51.2% respectively under the model structure with trade cost, and 33.8% and 39.0% respectively under the model structure without trade cost. Apparently, the optimal tariff rates have significantly increased after introducing trade cost into the model.

By introducing trade cost, the model arrives at higher optimal tariff rates. This implies that endogenous optimal tariff rates will decrease if trade cost falls or is removed. Trade liberalization is boosted with falling trade cost as a result of trade agreements, cost-efficient transportation and modern means of communication. During an economic and financial crisis, international trade cost will rise due to various reasons, prodding other countries to seek protectionism, which is a possible reason behind the backlash against globalization.

8. Conclusions

This paper employs a general equilibrium policy modeling and simulation method to systematically examine the impact of different model structures on the optimal tariff rates. By adding a host of near-reality assumptions into the standard model structure, we obtain diminishing optimal tariff rates, and reveal the endogenous drivers behind trade liberalization. As countries become more interdependent on each other and more involved in the global division of labor, their economic development calls for a

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higher degree of trade liberalization instead of protectionism.

Based on the two-country pure exchange Armington product model, this paper expands the model by introducing product structure and the cross-border flow of capital. We further extend the two-country model into a multi-country model and introduces trade cost under the multi-country model structure. By including these near-reality assumptions, we obtain decreasing optimal tariff rates, which verifies our analysis of the endogenous drivers behind trade liberalization.

As shown in the simulation results, the optimal tariff rates will decrease slightly after production structure is included into the pure exchange model; the optimal tariff rates will significantly decrease after the cross-border flow of capital is introduced; the optimal tariff rates under the multi-country model structure are much lower than those under the two-country model; the optimal tariff rates under the model structure with trade cost are higher than those under the model without trade cost, i.e. falling trade cost corresponds to lower optimal tariff rates. In comparison, the cross-border flow of capital has the greatest impact on the optimal tariff rates, followed by the impact of preference elasticity, while trade cost and production structure exert the least impacts. Countries with large economic aggregate tend to set higher optimal tariff rates.

Optimal tariff rates are an important topic concerning trade protectionism, negotiations and protectionism. When a country's endogenous optimal tariff rate is low, the country will be more in favor of free trade. Otherwise, it becomes inclined to seek protectionism. By deriving the endogenous determinants of trade liberalization, this paper uncovers the short-term causes of "de-globalization," including falling cross-border flow of capital and rising trade cost. These factors will raise the endogenous optimal tariff rates of individual countries, thus nudging them towards protectionism and giving rise to a backlash against globalization. Yet in the long run, the endogenous drivers behind trade liberalization will remain. Once economies emerge from the shadows of crisis, they will jettison protectionism and embrace trade liberalization. Given the reasons behind "de-globalization," it is not an irrational choice for the crisis-hit countries to take a more protective stance, which is nonetheless a short-term countermeasure and will not persist in the long run.

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