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ORIGINAL ARTICLE

Effects of Eliminating the US–China Trade Dispute Tariffs

Jian Zheng[1], Shudong Zhou[1]*, Xingzi Li[1], Antonio Domingos Padula[2] and Will Martin[3]†

[1]Nanjing Agricultural University, Nanjing 210095, China, [2]The Federal University of Rio Grande do Sul, Porto Alegre CEP 90010-460, Brazil and [3]International Food Policy Research Institute, Washington, DC 20006, USA
*Corresponding author: Shudong Zhou, Email: sdzhou@njau.edu.cn

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Abstract

This paper examines the economic implications of the tariff increases by the United States and by China during the Trump era trade dispute and the gains from their potential removal. The increases were dramatic, with the US raising tariffs on industrial products by a factor of six – with particularly large tariff increases on intermediate and capital goods – and China increasing its tariffs on US agricultural products more than five-fold. These changes distort trade and production decisions in both countries and undercut the global trading system. They resulted in substantial economic losses to each country, with import volumes reduced by 4.9% in China and 4.5% in the USA, and bilateral trade patterns were massively distorted. Their cost to the United States rose at the end of 2021, when the import expansion provisions of the Trump era Phase One Agreement expired. Negotiating the abolition of these costly and disruptive tariffs would generate substantial real income gains for both countries and help lower US consumer prices.

Keywords: US–China trade dispute; Global Trade Analysis Project (GTAP) model; negotiation; scenario analysis; trade rules; trade war; Trump tariffs; WTO

1. Introduction

Since the consolidation of China's trade and market reforms in the early 1990s (World Bank, 1994), China's exports to the world have grown at around 12% per year, with exports to the United States growing at almost exactly the same rate.[1] After accession to the WTO in 2001, China's growth rate in exports to both the US and the world declined slightly but remained above 11% per year. This extraordinary growth performance created tensions – as well as opportunities – in a world where overall trade grew at 6.5% per year between 1993 and 2020. Part of the motivation for the prior members of the WTO in approving China's entry to the WTO in 2001 was to provide a forum in which the tensions associated with rapid trade growth by such a large country could be resolved through negotiation rather than conflict (Fewsmith, 2001).

The growth in bilateral trade between the US and China generated substantial gains to both countries. The ability to import agricultural products, and particularly soybeans, from the United States greatly mitigated the constraints on land and water facing China (Ali et al., 2017), while providing important market access gains to US farmers. The ability to separate stages of production via global production sharing allowed substantial increases in production efficiency and the variety of goods produced and traded (Baldwin, 2016), and reductions in consumer prices (Amiti et al., 2020).

†Primary authorship is shared between Jian Zheng and Shudong Zhou.
[1]All growth rates are in percent log change form.

In early 2018, the Trump administration raised a series of arguments about China's trade and trade-related policies, including concerns about requirements for foreign investors to form joint ventures and/or transfer technology and perceived inadequacies in protection of intellectual property rights (Bown and Irwin, 2019). Instead of taking these concerns to the WTO, where the US could have worked with other members, or negotiating bilaterally with China on specific issues, the Trump administration set off a tariff dispute, taking many US tariffs against China far above the levels allowed under US tariff bindings at the WTO.

On 15 June 2018, the Trump administration released a list of 1102 tariff lines covering roughly US$50 billion of imports on which the initial tariff would be increased by 25 percentage points (US Trade Representative (USTR), 2018). In response, the Chinese government raised tariffs by 25% on 659 commodities with a total value of about US$50 billion originating in the United States. On 18 June, President Trump asked USTR to identify an additional US$200 billion in imports to be subject to tariff increases of 10 percentage points. Following several rounds of threats, retaliation, and negotiations (Table 1), the United States had imposed additional tariffs on US$370 billion of imports from China, and China had reciprocated on US$140 billion. In the China–US Phase One Economic and Trade Agreement reached in January 2020, the additional US tariffs on approximately US$120 billion of Chinese goods were cut to 7.5%, and the additional tariffs imposed by China on approximately US$30 billion of US goods were cut to 2.5% or 5%. China also agreed to make substantial additional purchases of US goods for two years.

The massive tariff increases remaining after the reductions agreed in the Phase One Agreement have enormous implications for the world trading system as well as for the United States and China. They violate both the WTO's fundamental principle of non-discrimination in Article I of the GATT and each country's Article II commitment to maintain tariffs on each product below the levels permitted by its scheduled tariff bindings.

The primary policy issue addressed by this paper is the economic impacts on the United States and China of ending the Trump era tariffs. This is clearly an important issue for both countries, and for the world trading system. Flagrant violations of international treaties such as the Trump-initiated increases in tariffs above the limits to which each country had agreed risk both emulation by other countries and further escalation once these agreed limits have been breached. The analysis in this paper examines both the economic consequences of the series of tariff increases involved in the China–US trade dispute, and the slight de-escalation under the Phase One Agreement of 2020. It focuses particularly on evaluating the impacts of the tariff increases, and their potential future removal, on real incomes and trade outcomes.

A subsidiary policy question is whether the original tariffs introduced by the United States could have generated benefits to the United States even had China not retaliated. The world trading system is, after all, designed in large measure to deal with situations where individual countries seek to gain by imposing trade barriers that make them better off at the expense of their trading partners (Bagwell and Staiger, 2016).

Most of the simulation experiments examine the effects of changes in US tariffs together with the tariff changes imposed by China in retaliation. In addition, two experiments examine whether the first two increases in US tariffs – imposed when the US President thought that 'tariff wars are good and easy to win' – would have increased the welfare of the United States without retaliation by China (Reuters Staff, 2018). This analysis shows that, even in the absence of retaliation by China, the United States would have lost from the second of these tariff increases, which took tariffs too high to allow improvements in the terms of trade to compensate for the associated efficiency losses.

The Global Trade Analysis Project (GTAP) model (Hertel, 1997; Aguiar et al., 2019) is used to assess the consequences of removing the tariffs that will remain after completion of the Phase One Agreement. For several reasons, the analysis does not examine the effect of the import targets in the Phase One Agreement. A key reason is that these non-market measures fell far short of

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Table 1. US–China trade dispute timeline: major events since June 2018

Date	USA	China
15 June 2018	The USA announced additional tariffs of 25% on 1102 tariff lines covering US$50 billion of US imports from China.	China decided to impose additional duties of 25% on 659 tariff lines covering about US$50 billion worth of imports from the USA.
06 July 2018	US tariffs on US$34 billion of Chinese imports went into effect, the first phase of its 15 June US$50 billion list.	China's tariffs on the first US$34 billion of its $50 billion list of US imports went into effect.
10 July 2018	The USA released a list of US$200 billion of imports from China to be subjected to new 10% tariffs.	
03 August 2018		China warned it could impose additional duties of 5 to 25% on 5207 types of US commodities worth about US$60 billion.
23 August 2018	US tariffs on US$16 billion of Chinese imports went into effect, the second phase of its 15 June US$50 billion list.	China's tariffs on the second US$16 billion of its $50 billion list of US imports went into effect.
24 September 2018	US placed 10% tariffs on US$200 billion worth of Chinese imports.	China responded by placing customs duties on US$60 billion worth of US goods.
10 May 2019	After trade negotiations broke down, the USA increased tariffs on US $200 billion worth of Chinese goods, from 10 to 25%.	
1 June 2019		China increased tariffs on US$60 billion worth of US products.
13 August 2019	The USA announced additional tariffs of 10% on goods of China with an annual trade value of approximately US$300 billion.	
23 August 2019		China announced planned tariffs of 5 and 10% on US$75 billion worth of US goods.
1 September 2019	US tariffs on about US$120 billion of Chinese imports went into effect, the first phase of its 13 August US$300 billion list.	China's tariffs on about US$30 billion of its $75 billion list of US imports went into effect.
15 January 2020	China and the US signed the Phase One trade deal.	
14 February 2020	The USA halved additional tariffs on about US$120 billion worth of Chinese products imposed on 1 September 2019.	China halved additional tariffs on about US$30 billion worth of US products imposed on 1 September 2019.

Source: Based primarily on Bown and Kolb (2022).

achieving their targets (Bown, 2022), making it particularly difficult to assess the impact of these non-transparent and unenforceable non-tariff measures. Another is that they were only for two years, after which any benefit they may have provided to the United States disappeared and the key policy question became what to do about the remaining WTO illegal Trump era tariffs.

This paper builds on earlier research on the Trump era US–China trade dispute, such as the study by Li et al. (2020), primarily by focusing on the new policy question of what to do about these tariffs once the Phase One import targets have expired. It builds on the prodigious contributions of Bown (2022) in documenting the policy changes and proximate impacts of the Trump era tariff impositions and China's policy responses, by estimating the impacts of dismantling these interventions. Like Flaaen and Pierce (2020), it considers three key channels of effect for each country – the effect of tariff increases by its trading partner, the impact of its own tariffs on intermediate inputs, and the effects of its own tariffs on consumer goods. Unlike them, we focus only on the Trump tariff dispute with China, rather than the Trump era trade conflicts with a wide range of trading partners.

The second section of the paper reviews some of the key literature; the third section discusses research methods as well and simulation scenarios, i.e. baseline scenarios and policy simulation scenarios; the fourth section presents results of the simulation analysis of the impact of the China–US trade dispute; the fifth section considers tariff reductions under the China–US Phase One Economic and Trade Agreement; the sixth section presents results from simulations of both countries eliminating the Trump era tariffs; the seventh section presents conclusions and policy implications of the study.

2. Literature Review

China–US trade issues have attracted considerable analytical attention in recent decades. At the time of China's accession to the WTO, there was considerable concern about the adjustment pressures China's tariff cuts might place on China's economy and particularly in sectors then seen as vulnerable, such as agriculture (Huang et al., 2009) and automobiles (Francois and Spinanger, 2004). Every single tariff in China's tariff schedule was cut by the accession agreement and weighted average tariffs fell from 40.6% in 1992 to 12% at accession and to 6.8% after all of China's concessions were phased in (Ianchovichina and Martin, 2001). By contrast, US tariffs were not changed at all. The only liberalization by the United States was a very slow phase out of quotas on China's exports of textiles and clothing.

Detailed analyses of China's WTO commitments and the economic impacts of the agreement on China in Bhattasali et al. (2004) highlight the importance of China's accession for both China and her trading partners. At the time, there was also great concern about the possible implications for China's agriculture, industry, and services (Anderson et al., 2004; Pangestu and Mrongowius, 2004). WTO rules in general, and China's WTO Accession agreement in particular, are designed to reduce the risk of arbitrary changes in policy, such as tariff increases, that can be very costly and ignite multiple rounds of escalation. They also provide access to multilateral mechanisms for consultation and dispassionate resolution of disputes. Each member commits, in particular, not to raise its tariffs above the tariff bindings to which it has agreed at the WTO. Absent such commitments in the pre-WTO period, the result was frequently bursts of trade conflict in which large countries raise tariffs, their trading partners retaliate, and all sides lose (Irwin, 2011).

China's own liberalization before and after accession to WTO helped to increase efficiency and to expand exports rapidly. Another factor promoting growth in exports to the United States was a reduction in trade policy uncertainty. Prior to accession, China faced a risk each year of US tariffs rising to the much higher levels introduced by Smoot and Hawley during the Great Depression. Believing this risk removed, firms made many investments associated with producing for and supplying the US market (Feng et al., 2017). Unfortunately, and surprisingly given the widespread perception that US labor markets are relatively flexible, the rapid growth of Chinese exports

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appears to have created problems of unemployment and wage reductions in many local labor markets (Autor et al., 2013). While they estimate that trade accounted for only around a quarter of the total impact and exports from China for only a portion of that, exports from China received enormous attention from researchers and policy makers.

Posen (2021) believes that much of the focus of US policy on competition from China (and from Japan a generation previously) in manufacturing reflects nostalgia for an economic past with a larger share of the workforce in manufacturing. Like Rodrik (2016), Posen notes that a decline in the share of manufacturing in employment is a standard feature of economic development for higher income countries. Recent World Bank data suggest that China has already reached the beginning of this decline, with employment in industry peaking at 30% in 2012 and falling to 27% by 2019. Attempting to reverse such changes through trade protection results in both overall income losses and potentially strong adverse shocks in the industries and locations forced to contract by the adverse impacts of protectionist interventions.

Clearly, another contributing factor to the trade dispute was President Trump's focus on bilateral trade deficits and his – unfortunately all too common – misconception that trade deficits are determined by trade policy (Johnson, 2020). This failure to understand that the current account deficit is determined by the gap between income and expenditure led to contradictory policies, such as pairing expansionary budgetary policies that increase the current account deficit with trade policy interventions that are ineffective in reducing it.

In terms of quantitative research, the main research tool adopted for this type of issue has been the computable general equilibrium model. Some of the research was conducted before the outbreak of US–China trade dispute, examining stylized shocks such as the 45% tariff increases on Chinese goods proposed by Trump before he took office (Haberman, 2016). Rosyadi and Widodo (2018) used the GTAP model to analyze this policy change and concluded that, if 45% additional tariffs were imposed on manufacturing products by both countries, the real incomes of the United States and China would decline by US$80 billion and US$94 billion, respectively. Similarly, Dixon's (2017) research on 45% additional tariffs on manufacturing products by both countries showed that the real incomes of the United States and China would decline by 0.7% and 2.5%, respectively. Research by Guo et al. (2018) shows that, if the US imposed a 45% tariff on all Chinese goods, US real wages would decline by 0.66%; if China imposed a reciprocal tariff, they would decline 0.75%. Bouët and Laborde (2018) analyzed the impact of hypothetical trade disputes between the United States and emerging market countries such as China and Mexico and showed that even if China and Mexico did not retaliate, additional 35% tariffs imposed by the US on all goods from China and Mexico (except energy goods) would reduce US social welfare by 0.1%; if reciprocal retaliation by China and Mexico were considered, US social welfare would be reduced by about 0.4%.

Some studies have considered policy simulations closer to the actual outcome of the US–China tariff dispute. Cui et al. (2018) concluded that if the United States imposed a 25% import tariff on Chinese goods of US$50 billion, and China imposed an equivalent tariff, real gross domestic product (GDP) in the United States and China would fall by 0.02% and 0.13%, respectively. If the US imposed 10% tariffs on an additional US$200 billion of Chinese goods and China imposed 10% tariffs on an additional US$60 billion in US goods, the real GDP of the US and China would be reduced by 0.03% and 0.29%, respectively (Zhou and Shi, 2019). Zhou et al. (2019) used a policy simulation similar to Cui et al. (2018). They concluded that total imports of agricultural products in China decreased by 6.6% after China and the United States increased their tariffs in 2018, and that US imports and exports of agricultural products would decline by 2% and 5.4%, respectively.

Li et al. (2020) focused on the tariff increases after the China–US Phase One Agreement and found that these additional tariffs would reduce the welfare of the US and China by 0.2% and 1.7%, respectively. Li et al. (2021) considered the regional impacts within China and found that if the US had unilaterally imposed 25% tariffs on all products already announced, China's

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eastern coastal provinces would have been particularly adversely affected. Bellora and Fontagné (2019) considered a much wider set of Trump-initiated trade barriers against the EU, Canada, and Mexico, and other trading partners as well as China. Their study focused on the adverse impacts for US industry given the prevalence of tariff increases on intermediate goods, a topic to which we return.

Freund et al. (2020) considered the impacts of China's agreement under the Phase One Agreement to expand imports from the United States. They concluded that these would discriminate against other countries, and particularly other developing countries, unless China used this as an opportunity for broader liberalization. Feenstra and Hong (2020) focused on the agricultural import targets under the Phase One Agreement. They estimated a non-homothetic demand system for agricultural imports into China and showed that the most efficient way for China to achieve the Phase One Agreement's import targets would be to mimic the effect of an import subsidy. If China's agricultural imports did not otherwise grow from their 2017 values, they concluded that the subsidies would need to be 42% and 59% to meet the 2020 and 2021 targets, respectively. These subsidies would divert agricultural imports to the USA and away from other suppliers. This trade diversion would be especially strong for Australia and Canada, followed by Brazil, Indonesia, Malaysia, Thailand, and Vietnam. Estimating the impact of these import expansions now seems a low priority since these provisions did not bind (Bown, 2022) and expired at the end of 2021, while the Trump era tariffs remain in the absence of a negotiated agreement.

The existing studies provided important background for this study but leave many important questions unanswered. Most were conducted before the full features of the Trump era trade dispute were known and so are based on potential tariff changes or on tariffs at earlier stages of the negotiations. Many focused on the impact of the trade dispute on macroeconomic aspects such as overall economic welfare but lacked analysis on the gains and losses to specific industrial sectors, and particularly the differential impacts between agriculture and industrial trade. This paper uses detailed information on the actual trade dispute tariffs and traces the impacts for key sectors of removing them.

3. Research Methods and Simulation Scenarios

3.1 Research Methods

The Global Trade Analysis Project (GTAP) is a global network of researchers and policy makers conducting quantitative analysis of international policy issues (Walmsley et al., 2012). A key component of the GTAP project is the CGE model known as the GTAP Model, documented in the GTAP book (Hertel, 1997). In this paper, the GTAP model is applied to create baseline scenarios and policy simulations.

3.2 Data Sources and Database Modification

The data underlying the model are primarily drawn from the GTAP10 database developed by Purdue University (Aguiar et al., 2019). This database includes final expenditures, input–output data, bilateral trade data, trade barriers, and relevant behavioral parameters. Because the China–US trade dispute broke out in 2018, intensified in 2019, and was attenuated by the China–US Phase One Economic and Trade Agreement reached in 2020, it is useful to update the database before assessing the impacts of each of these policy changes. In this study, 2018, 2019, and 2020 are selected as three baseline years. Using the dynamic recursion method proposed by Walmsley et al. (2000), population, GDP, capital, and labor data in GTAP database are projected and simulations are used to update the endogenous variables in the database.

The 141 countries (regions) and 65 sectors in the GTAP 10 database are aggregated into 10 regions and 16 sectors consistent with the research purpose. The countries/regions are: China,

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the USA, Korea, Oceania, ASEAN, the Middle East, EU, Brazil, Other South America, and Rest of the World; and the sectors: Rice, Other grains, Oil crops, Fruits/vegetables/nuts, Tobacco, Meat, Aquatic products, Dairy products, Other agricultural products, Fuels, Chemical and rubber products, Transport equipment, Metal and products, Electronics, Other industrial products, and Services.

3.3 Design of Simulation Scenarios

Because the GTAP database represents the pre-trade dispute situation, we must introduce the trade dispute tariffs, prior to their removal. The simulation scenarios are based on the commodities subject to additional tariffs announced by the Chinese government and US government, including three baseline scenarios and six policy simulation scenarios.

In the policy simulations, we focus primarily on the changes in each round, where the US increased tariffs and China retaliated. But we also consider the outcome where the US imposed tariffs but China did not retaliate, since this allows us to see whether each country's tariff increases were welfare-reducing for itself, as well as for its trading partner (Table 2).

Aguiar's (2019) correspondence between HS codes and GTAP industry sectors was used with bilateral trade weights to calculate the tariff increases for the GTAP sectors. These were, in turn, aggregated to the 16 industrial sectors used in the simulations (Table 3). The lists of commodities subject to additional tariffs were obtained from the Tariff Policy Commission of the State Council of China and the Office of the US Trade Representative. Bilateral trade data for 2017 were obtained from the General Administration of Customs of China[2] and the United States Census Bureau[3]. The tariff data of the two countries and the trade data for China are at the 8-digit level. The trade data of the US are at the 10-digit level, and we aggregated them to the 8-digit level to calculate weighted average tariffs. While trade weighted averages are downward biased when assessing the effects of liberalization because high tariffs reduce the weight on the goods to which they apply (Laborde et al., 2017), this problem does not apply in this case because the trade weights reflect the low tariffs prior to the tariff dispute.

Figure 1 shows that the US increased its average import tariffs on Chinese agricultural and industrial products to 9.2 and 9.5% in 2018, and further increased them to 23% and 19% in 2019. China's increases in bilateral tariffs on industrial products resulted in more than a tripling of the average, from 5.3% to 17.1%. China increased its tariffs on agricultural imports much more than on industrial products, to 26.7% in 2018, and to 32.1% in 2019, taking them to almost six times their initial level. In 2018, the US responded by introducing subsidies to farmers whose products were adversely affected by these tariffs (Bown and Kolb, 2022). These payments helped farmers in the short term but added additional economic costs to those measured in this paper and are seen as likely to exacerbate future trade tensions and to precipitate future WTO disputes (Glauber, 2020).

A surprising feature of the US tariff increases is that they were much larger on intermediate and capital goods than on final consumer goods – a distinction that reinforces the concerns of Bellora and Fontagné (2019) about potentially adverse impacts on global value chains. Using the Classification by Broad Economic Categories (BEC), bilateral trade between the United States and China was divided into three categories: consumption goods, intermediate goods, and capital goods. Table 4 shows that the focus of US tariff increases on China was on intermediate goods, for which tariffs increased by 22.2%, and capital goods, for which tariffs rose by 20.9%, by contrast with an 11.6 percentage point rise for consumer goods. By contrast, China increased import tariffs on consumption goods, intermediate goods, and capital goods by 23.6%, 14.9%, and 5.4%, respectively.

[2]http://43.248.49.97/indexEn.
[3]https://usatrade.census.gov/.

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Table 2. Baseline scenarios and policy simulation scenarios

Scenario	USA	China
Baseline scenario 1	By applying the dynamic recursion method, the database was updated from 2014 to 2018 using exogenous variables such as population, GDP, capital and labor force, using projections from CEPII (Fouré et al. 2013).	
Policy simulation scenario 1a (US tariffs & China's retaliation in 2018)	(1) 25 percentage points added to tariffs on US$50 billion commodities imported from China. (2) 10 percentage points added to tariffs on US$200 billion of commodities imported from China.	(1) 25 percentage points added to tariffs on US$50 billion of commodities imported from the US. (2) 5% or 10 percentage points added to tariffs on US$60 billion of commodities imported from the US.
Policy simulation scenario 1b (US tariffs without Retaliation by China)	(1) 25 percentage points added to tariffs on US$50 billion of commodities imported from China. (2) 10 percentage points added to tariffs on US$200 billion of commodities imported from China.	
Baseline scenario 2	The database was updated to 2019 using the same method as in baseline scenario 1, assuming no trade dispute between the United States and China.	
Policy simulation scenario 2a (US tariffs & China's retaliation in 2019)	(1) 25 percentage points added to tariffs on US$250 billion commodities imported from China. (2) 15 percentage points added to tariffs on US$120 billion of commodities imported from China.	(1) 25 percentage points added to tariffs on US$50 billion commodities imported from the US. (2) 5% to 25 percentage points added to tariffs on US$60 billion commodities imported from the US. (3) 5% to 10 percentage points added to tariffs on US$30 billion of commodities imported from the US.
Policy simulation scenario 2b (US tariffs without Retaliation by China)	(1) A25 percentage points added to tariffs on US$250 billion commodities imported from China. (2) 15 percentage points added to tariffs on US$120 billion of commodities imported from China.	
Baseline scenario 3	The database was updated from 2019 to 2020 by applying the dynamic recursion method based on policy simulation scenario 2a, with tariffs updated to their 2019 levels to provide a benchmark for policy simulation 3.	
Policy simulation scenario 3	Additional tariffs on US$120 billion commodities imported from China reduced to 7.5%, while other tariffs imposed on China remained unchanged.	Additional tariffs on US$30 billion commodities imported from the US reduced to 2.5% or 5%, while other tariffs imposed on China remained unchanged.
Policy simulation scenario 4	Eliminating the remaining above-MFN tariffs introduced in the Trump era trade dispute.	

The strong focus on intermediate and capital goods in the US tariff increases is unusual because business interests are usually more effective than consumer interests in opposing tariff increases. Consistent with this, it appears that some firms were successful in obtaining 'exclusions', but that the large majority of these expired by December 2020 (Flaaen et al., 2021).

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Table 3. China–US bilateral import tariffs for each industry before and after trade disputes

	Import Tariffs Imposed by China on the United States				Import Tariffs Imposed by United States on China			
Sectors	Baseline Scenario	Scenario 1a	Scenario 2a	Scenario 3	Baseline scenario	Scenario 1a and 1b	Scenario 2a and 2b	Scenario 3
Rice	1(in-quota)	26(in-quota)	26(in-quota)	26(in-quota)	5.30	15.30	30.30	30.30
Other grains	1.33	26.28	26.30	26.29	0.27	10.27	25.27	25.27
Oil crops	3.01	27.92	32.93	30.44	0.01	10.01	25.01	25.01
Fruits/vegetables/nuts	11.09	35.58	45.18	40.38	1.14	9.56	24.02	23.11
Tobacco	6.31	26.20	31.48	31.19	4.82	11.61	23.71	22.75
Meat	11.30	35.46	46.28	41.29	1.06	2.06	17.06	10.31
Aquatic products	8.54	33.53	43.21	38.38	0.04	2.72	17.72	12.22
Dairy products	6.07	30.97	31.79	31.43	19.35	29.35	44.35	44.35
Other agricultural products	5.39	20.42	25.56	24.47	2.36	9.75	23.30	22.06
Fuels	0.10	4.24	10.70	8.58	0.00	10.00	25.00	25.00
Chemical & rubber prods	5.93	12.24	16.10	15.44	2.99	9.55	19.48	18.27
Transport equipment	11.74	22.09	22.14	22.13	1.44	13.98	24.99	24.86
Metal and products	2.61	15.16	22.01	21.99	2.16	9.72	21.77	20.12
Electronics	2.06	6.70	9.96	9.90	0.62	6.62	13.94	12.53
Other industrial prods	3.89	13.64	18.01	17.90	5.68	11.88	22.88	20.68
All products	5.33	15.16	18.92	18.44	2.94	9.46	19.08	17.41

Note: Trade-weighted average tariffs computed from commodity level tariff and trade data, weighted by each exporting country's exports to the world before trade disputes.

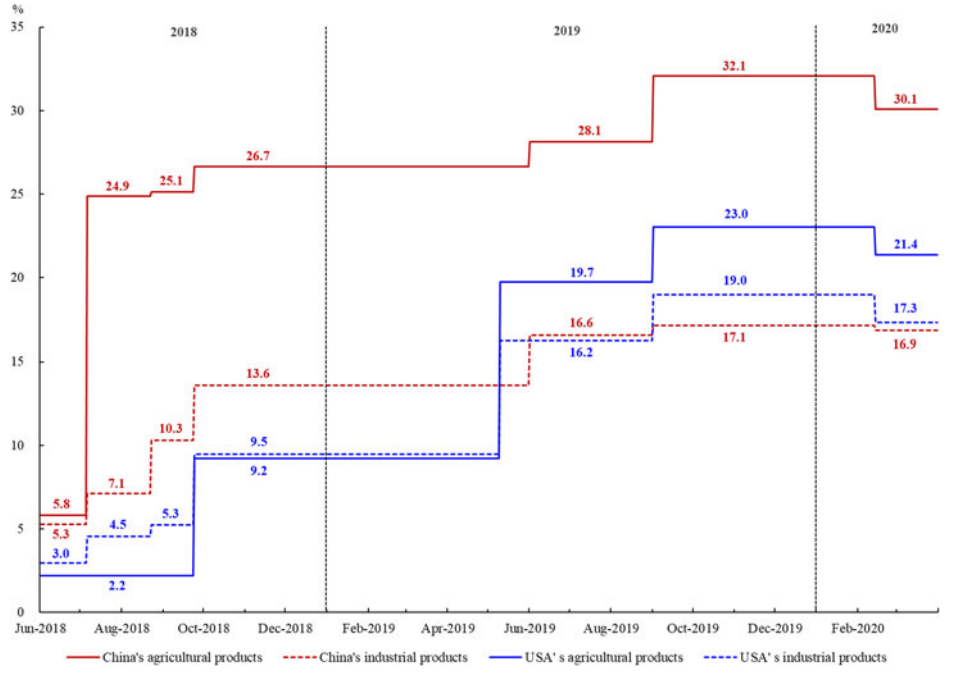

Figure 1. China–US bilateral import tariff increases, percentage points. Source: GTAP database and the list of additional tariffs published by China and the United States.

The unusual focus of the Trump tariffs on intermediate and capital goods presumably reflected a desire to avoid being blamed for increases in the costs of prominent consumer goods – many of which are made in China for American companies such as Apple. Research by several eminent American trade economists (Amiti et al., 2020) concluded that the US tariff increases were, in fact, passed through entirely to US importers and customers. Another possible reason for the relatively large increases in tariffs on intermediate and capital goods is presumably that these tariff increases were not a result of pressure from US firms, but rather based on ideological arguments and misperceptions, such as the belief by senior Trump trade advisor Peter Navarro that no country would retaliate against US tariff increases because the US is the world's biggest market (Bown and Irwin, 2019, p. 128) or that tariff increases would reduce the US current account deficit. The strong focus of the US tariff increases on intermediate and capital goods has more serious adverse impacts for the competitiveness of US firms than China's pattern of tariff increases.

Table 4. Bilateral tariff increases by broad economic category, % points to 2019

	Tariff Increases by China on the United States	Tariff Increases by the United States on China
Consumption goods	23.6	11.6
Intermediate goods	14.9	22.2
Capital goods	5.4	20.9
All goods	13.1	18.0

Note: The correspondence between HS and BEC was used with bilateral trade weights to calculate the tariff increases for intermediate and final goods.

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Table 5. The impact of the China–US trade dispute on macroeconomic outcomes

	China		USA	
	Policy Simulation Scenario 1a vs Baseline Scenario 1	Policy Simulation Scenario 2a vs Baseline Scenario 2	Policy Simulation Scenario 1a vs Baseline Scenario 1	Policy Simulation Scenario 2a vs Baseline Scenario 2
Real GDP (%)	−0.2	−0.3	−0.04	−0.15
Import volume (%)	−2.9	−4.9	−2.8	−4.5
Export volume (%)	−1.3	−2.0	−1.8	−2.8
Bilateral trade/GDP (% points)	−0.4	−1.2	0.4	1.0
Real income (%)	−0.4	−0.6	−0.1	−0.2
Real income ($ billion)	−39.3	−75.3	−15.2	−33.5

Source: Simulation results from the GTAP model.
Note: Real GDP measures changes in the volume of output. Real Income changes are measured using Equivalent Variation.

4. Simulated Impacts of the Trade Dispute

4.1 Macroeconomic Impacts

The estimated impacts of the tariff increases in 2018 and 2019 on the macro-economies of the United States and China are presented in Table 5. The initial tariff increases by the United States and by China reduce the volume of China's GDP by 0.2%, and that of the United States by 0.04%, as increases in the costs of intermediate inputs cause the volume of output to decline. The 2019 intensification of the trade dispute had further negative impacts on economic output in both China and the United States. Compared with baseline scenario 2, the volume of GDP in China and the United States would be reduced by 0.3% and 0.15%, respectively. The real income measures based on Equivalent Variation (EV) decline by more than the GDP volume measures because they incorporate the welfare costs of distortions on consumer goods as well as the impacts on output resulting from higher prices of intermediate goods.

The trade scenarios considered in Table 5 lead to modest declines in the total trade of each country because the large declines in bilateral trade volumes are offset by trade diversion to/from other countries (regions). The total import volumes of China and the United States decreased by 2.9% and 2.8%, respectively from the 2018 tariff increases. China's total export volume decreased by 1.3% with the 2018 tariff increases, while US exports declined by 1.8%. The 2019 tariff increases are estimated to reduce China's total import and export volumes by 4.9% and 2%, and total import and export volumes of the United States by 4.5% and 2.8%, respectively.

As expected, tariff changes have very modest impacts on each country's bilateral trade balance, with the US bilateral trade balance with China as a share of GDP changing by only 0.4 and 1 percentage points, respectively. For China, the bilateral trade balance with the USA as a share of GDP declines by 1.2% under the 2019 scenario.

4.2 Impacts on Sectoral Trade of China and the United States

We know that bilateral tariff increases of the magnitude under study will sharply reduce bilateral trade, but that some of these losses will be compensated by diversion to/from other trading partners. Table 6 shows the impacts of the 2018 and 2019 tariff increases from baseline that perhaps matter most to producers and traders – import and export volumes by commodity and sector. In most cases, the 2019 tariffs generate larger trade declines, with China's total exports falling by 2.6% and imports by 5.4%. For the US, export volumes fall by 4.7% and imports by 5.9%.

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Table 6. Impacts of the trade dispute on import and export volumes of major commodities (%)

	China				USA			
	Imports		Exports		Imports		Exports	
Sectors	Policy Simulation Scenario 1a vs Baseline Scenario 1	Policy Simulation Scenario 2a vs Baseline Scenario 2	Policy Simulation Scenario 1a vs Baseline Scenario 1	Policy Simulation Scenario 2a vs Baseline Scenario 2	Policy Simulation Scenario 1a vs Baseline Scenario 1	Policy Simulation Scenario 2a vs Baseline Scenario 2	Policy Simulation Scenario 1a vs Baseline Scenario 1	Policy Simulation Scenario 2a vs Baseline Scenario 2
Rice	−1.8	−4.9	0.5	3.5	−2.5	−3.3	4.2	5.2
Other grains	−12.6	−14.1	1.1	4.9	−3.3	−3.9	−0.2	0.6
Oil crops	−4.7	−5.7	−6.2	−5.8	−10.5	−12.5	−21.3	−23.8
Fruits/vegetables/nuts	−2.8	−4.6	0.6	2.1	−2.0	−2.6	2.4	2.7
Tobacco	−5.3	−7.3	1.2	2.6	−0.7	−0.9	−4.3	−5.3
Meat	−10.3	−14.6	5.6	10.6	−2.8	−4.1	−0.8	−0.4
Aquatic products	−4.0	−6.0	1.6	2.8	−1.4	−2.1	−4.7	−6.1
Dairy products	−6.0	−8.7	2.2	7.0	−2.4	−3.0	−5.7	−5.2
Other agricultural products	−4.3	−6.8	−1.4	−1.8	−2.3	−3.6	−3.2	−4.2
Fuels	−0.3	−0.8	0.9	2.5	0.3	1.1	−0.7	−1.8
Chemical and rubber products	−3.3	−6.0	−0.8	−0.7	−2.6	−4.4	−0.6	−1.7
Transportation equipment	−6.3	−8.5	−4.0	−2.6	−2.1	−3.0	−5.0	−5.6
Metal and products	−4.3	−7.3	0.4	1.7	−3.2	−5.3	−3.1	−4.8
Electronics	−3.2	−5.7	−2.3	−3.5	−6.1	−10.6	−4.9	−9.8
Other industrial products	−3.4	−5.8	−1.3	−3.1	−4.5	−9.3	−2.0	−3.5
Agricultural products	−5.0	−7.1	−0.5	0.04	−2.2	−3.2	−4.9	−5.6
Industrial products	−3.1	−5.2	−1.6	−2.6	−3.4	−6.1	−2.8	−4.6
Total	−3.3	−5.4	−1.6	−2.6	−3.3	−5.9	−3.1	−4.7

Source: Simulation results from the GTAP model.

At the sector and commodity level, China's agricultural imports fell by 7.1% under the 2019 scenario while agricultural exports rose very slightly as output of some commodities increased. China's imports were reduced by relatively large amounts in grains, meat, oilseeds, and transport equipment. Industrial exports fell by 2.6% under the 2019 scenario. The adverse impacts on China's exports were mainly in oilseeds, transport equipment, and electronics.

US agricultural exports declined by 5.6% under the 2019 scenario, while imports declined by only 3.2%. The most dramatic decline in US exports is in oilseeds, with a 24% decline. US industrial exports fell by 4.6% under the 2019 scenario, with larger falls in electronics and transportation equipment. Imports of industrial goods fell by 6.1% on average, with the largest declines in electronics (10.6%).

4.3 Impacts of US Tariff Increases on China with and without Retaliation by China

Large countries like the United States or China can potentially use trade restrictions to raise the prices they receive for exports and/or to lower the prices they pay for their imports. Under some circumstances, the income gains from the resulting improvements in their terms of trade can outweigh the costs of the associated economic distortions. The world as a whole is made worse off by these policies, and even worse off if trading partners retaliate. Indeed, a key reason for international trade rules is to deal with these problems (Bagwell and Staiger, 2016). But whether a country gains or losses from unilaterally raising its tariffs is important from a policy perspective since some participants in policy debates frequently advocate restrictive policies on terms-of-trade grounds.

Since the welfare impact of tariffs on a country imposing them is a balance between its gains from improved terms of trade (which rise roughly linearly with the tariff increase) and the costs of trade distortions (which rise with the square of the tariff), the likelihood of loss is greater the higher the tariff imposed. But whether a particular set of tariff increases raises or lowers the economic welfare of the imposing country depends on key details, such as market shares, elasticities, and the extent of the increases in individual tariffs – parameters that are included in our modeling framework.

Simulations 1b and 2b examine the impacts of US tariff increases against China had China not taken any retaliatory measures – the scenario apparently envisaged by Trump trade adviser Peter Navarro (Bown and Irwin, 2019, p. 128). The impacts of US tariff sanctions against China in 2018 and 2019 on the macro-economy of the United States are listed in Table 7. Compared with baseline scenario 1, the volumes of US GDP, imports and exports would decline by 0.04%, 1.6%, and 1.5%, respectively. Real income would increase by an infinitesimally small 0.003%. With the 2019 tariffs, real income would decline considerably more than with the 2018 tariff increases. US real

Table 7. The impact of US tariffs against China on the US macro-economy

	US 2018 Tariff Increases	US 2019 Tariff Increases	Policy Simulation Scenario 1a vs 1b	Policy Simulation Scenario 2a vs 2b
Real GDP (%)	−0.04	−0.14	−0.003	−0.01
Import volume (%)	−1.6	−3.1	−1.2	−1.4
Export volume (%)	−1.5	−2.5	−0.29	−0.31
Bilateral trade /GDP (% points)	0.7	1.4	−0.3	−0.4
Real income (%)	0.003	−0.1	−0.1	−0.1
Real income ($ billion)	0.5	−14.0	−15.7	−19.5

Source: Simulation results from the GTAP model.

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Table 8. Impact of the China–US Phase One tariff cuts on the macro economy

	China	USA
Real GDP (%)	0.01	0.02
Import volume (%)	0.31	0.25
Export volume (%)	0.10	0.12
Bilateral trade balance/GDP (% point)	0.1	−0.1
Real income (%)	0.04	0.02
Real income ($ billion)	5.5	3.7

Source: Simulation results from the GTAP model.

income would decline by 0.1% or US$14 billion. This means that the 2019 US tariff increases against China would have harmed the US economy even had China had not retaliated.

The last two columns of Table 7 examine the impacts on the US of China's retaliation in response to the initial tariff increases. They show that China's retaliation during the 2018 round of the tariff dispute cost the US$15.7 billion, dramatically outweighing the tiny US$0.5 billion benefit to the US had it been able to impose the tariff increases without retaliation. In the 2019 round, China's retaliation cost the US$19.5 billion in addition to the US$14 billion in losses resulting from the US tariff increases.

5. Impacts of the China–US Phase One Agreement Tariff Cuts

Compared with the 2019 scenario, the modest tariff cuts under the China–US Phase One Economic and Trade Agreement in 2020 provided benefits to both China and the United States, with China's real income rising by 0.04% and US real income by 0.02%. Although the tariff changes are small, they occur in some of the highest and most distorting tariffs so the welfare gains are larger than would be expected with such small changes (Martin, 1997). As shown in Table 8. the real incomes of China and the USA increased by an estimated US$5.5 billion and US$3.7 billion, respectively.

The results in Table 8 show that the Phase One tariff reductions would increase China's imports by 0.31% and US imports by 0.25%. In Table 9, we see that China's industrial imports increased by an estimated 0.32% and exports by 0.15%. The increases in agricultural imports would be larger at 0.42%, with exports falling by 0.23%. US industrial imports increased by 0.44%, exports increased by 0.18%; agricultural imports increased by 0.15%, and exports increased by 0.24%.

Turning to the commodity results in Table 9, China's oil crop imports increased by 0.38%. China's meat imports increased by 1.02%. China's chemical and rubber products imports increased by 0.42%. China's imports of transportation equipment increased by 0.35%. China's imports of metals and its products increased by 0.42%. China's imports of electronic equipment increased by an estimated 0.39%.US exports of oilseeds, electronic equipment, and chemical and rubber products have increased by an estimated 1.8%, 0.6%, and 0.2%, respectively.

6. Impacts of Eliminating the Trump Era Tariffs

6.1 Impacts on Macroeconomic Outcomes

For this final simulation, we updated the baseline to 2020 as specified for baseline simulation 3. From this baseline, the policy simulation considers the effects of China and the United States, removing the tariff increases remaining after the Phase One Agreement and returning

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Table 9. Impacts of the Phase One tariff cuts on import and export volumes of key commodities of China and the United States (%)

	China		USA	
Sectors	Import	Export	Import	Export
Rice	0.40	−0.51	0.11	−0.23
Other grains	0.21	−0.64	0.15	−0.27
Oil crops	0.38	−0.05	0.72	1.81
Fruits/vegetables/nuts	0.42	−0.29	0.12	−0.03
Tobacco	0.21	−0.25	0.04	0.02
Meat	1.02	−0.17	0.32	0.02
Aquatic products	0.59	−0.01	0.23	0.65
Dairy products	0.43	−0.90	0.11	−0.14
Other agricultural products	0.41	−0.23	0.16	0.13
Fuels	0.10	−0.29	−0.15	0.22
Chemical and rubber products	0.42	−0.27	0.20	0.16
Transportation equipment	0.35	−0.72	0.08	0.06
Metal and products	0.42	−0.40	0.20	0.06
Electronics	0.39	0.25	0.83	0.56
Other industrial products	0.35	0.34	0.88	0.12
Agricultural products	0.42	−0.23	0.15	0.24
Industrial products	0.32	0.15	0.44	0.18
Total	0.33	0.14	0.42	0.19

Source: Simulation results from the GTAP model.

to their prior tariff rates, which were essentially the bound tariff levels to which both have committed at the WTO. The results show that real incomes of China and the United States would increase by 0.6% and 0.2%, respectively, or by US$73.1 billion and US$31.4 billion. The volume of GDP would increase by 0.2% and 0.1%, respectively as lower input and capital costs increase incentives for producers in each country to raise output (Table 10).

Table 10. Macroeconomic impacts of eliminating the Trump era tariffs

	China	USA
Real GDP (%)	0.2	0.1
Import (%)	4.7	4.5
Export (%)	1.9	2.8
Bilateral trade balance/GDP (percent point)	1.0	−0.9
Real income (%)	0.6	0.2
Real income (US$ billion)	73.1	31.4
CPI (%)	0.8	−0.7

Source: Simulation results from the GTAP model.

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Removal of the Trump era tariffs would expand both countries' trade volume. Total US exports and imports would increase by 2.8% and 4.5%, respectively. The US bilateral trade balance with China of GDP would decrease by 0.9%. China's exports and imports would increase by 1.9% and 4.7%, respectively. China's bilateral trade balance with the USA would increase by 1%. In the United States, where inflation is a serious problem, removal of the Trump era tariffs would provide a small but potentially useful downward shock to consumer prices of 0.7%. In China, where inflation is projected by the IMF to be 2.1% (IMF, 2022) in 2022 would have one-time boost in the CPI of 0.8%, potentially helping bring inflation closer to the Central Bank's target of 3%.

At roughly the same time as the China–US Phase One Economic and Trade Agreement was being signed, the COVID 19 pandemic began to wreak its havoc on people and on the global economy. The continued tariffs affect a range of products needed to reduce the damage created by the pandemic and are inimical to cooperation on other pressing trade issues, such as dealing with surging world prices of food and fertilizers and the challenges of global warming (Buckley and Friedman, 2021) where their cooperation is essential (Bergsten, 2022).

6.2 Impacts on Commodity Trade Volumes of China and the United States

Table 11 shows the impacts of removing the Trump era tariffs on trade volumes by commodity and sector. The removal of these tariffs would increase imports and exports of each country in all but a few cases and would increase bilateral trade to a vastly greater extent from the depleted

Table 11. The impact of eliminating the Trump era tariffs on import and export volumes (%)

Sectors	China		USA		China's Imports from USA	China's Exports to USA
	Import	Export	Import	Export		
Rice	4.7	−2.9	3.4	−5.0	227.8	199.5
Other grains	16.4	−3.8	4.3	−0.5	151.6	244.2
Oil crops	5.6	6.9	14.2	27.3	96.6	220.0
Fruits/vegetables/nuts	4.4	−1.7	2.7	−2.7	124.7	99.6
Tobacco	7.6	−2.3	0.9	5.7	54.3	39.6
Meat	16.2	−9.1	4.1	0.5	559.0	88.6
Aquatic products	5.7	−2.7	2.2	5.6	71.2	29.4
Dairy products	9.3	−5.5	3.2	6.7	349.6	269.9
Other agricultural products	6.9	2.0	3.5	4.7	109.7	120.8
Fuels	0.6	−2.4	−1.0	1.7	245.0	0.0
Chemical and rubber products	5.9	0.9	4.4	1.4	74.6	117.7
Transportation equipment	8.8	3.3	3.0	6.1	69.8	240.2
Metal and products	7.3	−1.4	5.4	4.9	258.0	178.8
Electronics	5.5	3.2	10.8	9.9	98.0	92.1
Other industrial products	5.8	2.8	9.6	3.6	125.6	92.8
Agricultural products	7.2	0.2	3.2	5.6	111.1	114.2
Industrial products	5.0	2.4	6.1	4.5	95.4	99.8
Total	5.2	2.4	6.0	4.6	98.8	100

Source: Simulation results from the GTAP model.

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levels resulting from the trade conflict. China's total agricultural imports would increase by 7.2%, while imports from the US would rise by 111%. China's total agricultural exports would rise by a 0.2%, while exports to the USA would rise by 114.2%. US agricultural exports would rise by 5.6%. The increases in bilateral trade in industrial products would be slightly smaller than for agricultural products, because China's tariff increases on agricultural products were particularly large.

A simple summary of the very large number of results presented in Table 11 is that they involve enormous increases in bilateral trade of most agricultural products, and very large increases in most industrial products. China's imports of other grains (wheat, maize, sorghum, etc.), for example, are estimated to rise by over 150%, an increase large enough to raise China's total imports of these products. China's imports of oilseeds from the US are estimated to increase by 97%, and total imports by 5.6%. China's imports of meat from the USA are estimated to increase by 559%, with China's total imports of meat increasing by 16%. China's imports of dairy products from the US are predicted to rise by 350%, contributing to an overall increase in China's imports of these products by 9.3%.

Within industrial products, bilateral trade in metals and metal products would increase by particularly large amounts, with US exports to China rising by 258% and US imports from China by 179%. US exports of transportation equipment to China would rise by 70%, with imports from China rising by 240%. US exports of transportation equipment would rise by 6.1%, while China's exports of these goods would rise by only 3.3%. Another important set of commodities is Electronics, where US exports to China would rise by 98%, while imports from China would rise by 92%. The increase in total exports of electronics would be greater for the US, at 9.9%, while China's exports would rise by only 3.2%.

7. Summary and Conclusions

The Trump trade dispute with China marked a sharp change in US policy away from the multilateral-based approach generally followed by US administrations since World War II. This paper traces the evolution of the Trump era tariff increases, with a first round of US tariff increases going far above US tariff commitments in 2018, and a second large round of increases in 2019. The US raised tariffs on industrial products by a factor of six, while China increased tariffs on US agricultural products more than five-fold.

Unusually, the Trump administration increased tariffs on intermediate inputs and capital goods much more than on final consumer goods, creating the economic damage due to disruption of global value chains highlighted by Bellora and Fontagné (2019). Increases in these tariffs are unusual because they are disruptive to the globalized production chains that have emerged for many goods, and because firms tend to be more effective than consumers in resisting such tariff increases.

The GTAP model is applied to assess the economic effects of the China–US trade dispute. Six policy simulation scenarios are designed to analyze the economic impact of the outbreak of trade dispute in 2018; intensification of the trade dispute in 2019; modest tariff reductions under the China–US Phase One Economic and Trade Agreement in 2020; and eliminating the Trump era tariffs.

The tariff increases through 2019 resulted in substantial economic losses to each country, with China losing about US$75 billion per year and the US$34 billion. Import volumes were reduced by 5% in China and 4.5% in the USA, with bilateral trade patterns massively distorted.

Because there is a possibility that tariff increases by a large country will increase its economic welfare by improving its terms of trade – and because this possibility is one of the main reasons that a rules-based system of trade agreements was developed – we examined the consequences had China not retaliated against the Trump tariff increases. The results showed that the 2018 US tariff increases would have resulted in an extremely small real income gain to the United States. The 2019 US tariff increases would have reduced US economic welfare by around

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US$14 billion per year even without retaliation by China. These tariff increases were far too large to have any economic justification on terms of trade grounds and the resulting losses were compounded by China's retaliation, taking total US losses to over US$33 billion per year.

The losses created by the first two rounds of tariff increases were slightly mitigated by the tariff cuts in the 2020 Phase One Agreement. Because tariffs started from such a high level in 2019, these tariff reductions brought about noticeable increases in real incomes. The Phase One Agreement also involved China agreeing to increase imports of specified products – an outcome which Feenstra and Hong (2020) note would most efficiently be achieved by creating incentives, such as substantial import subsidies, to expand imports of the targeted products. We did not estimate their effects in the two years of their application partly because it is inherently difficult to assess the effectiveness of such non-transparent quantitative measures – other than to observe that they were much less effective than planned – and partly because their policy relevance disappeared when they expired at the end of 2021, leaving only the tariff increases in effect.

The final step in our analysis was to assess the impacts of eliminating the Trump era tariffs by moving back to tariffs at or below the rates to which each country has committed at the WTO. The analysis suggests that the economic gains from eliminating the excess tariffs would be substantial for each country. As previously noted, elimination of these tariffs would also provide important systemic benefits by removing the threat to the multilateral trading system posed by the world's two largest trading countries retaining blatantly discriminatory tariffs against each other.

The removal of the Trump era tariffs would improve key macroeconomic outcomes in both countries, expand trade between China and the United States and remove the obstacles to efficient production associated with disproportionately large US tariff increases on intermediate and capital goods. Because the tariff increases were broadly comparable in magnitude, neither side would be making a concession by removing these tariff increases. Both countries would gain from the negotiated elimination of these tariffs, with the increase in China's real income estimated to be US$73 billion per year, and the increase in US real income to be US$31 billion. The largest increases in bilateral trade would occur in agriculture, where China's tariffs were increased much more than on industrial product tariffs during the trade dispute. Tariff elimination would also provide a modest but useful fall in the US Consumer Price Index.

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References

Aguiar, A. (2019) *Concordances – Six-Digit HS Sectors to GTAP Sectors*. West Lafayette, IN: Center for Global Trade Analysis, Department of Agricultural Economics, Purdue University.

Aguiar, A., M. Chepeliev, E. Corong, R. McDougall, and D. van der Mensbrugghe (2019) 'The GTAP Data Base: Version 10', *Journal of Global Economic Analysis* 4(1), 1–27.

Ali, T., J. Huang, J. Wang, and W. Xie (2017) 'Global Footprints of Water and Land Resources Through China's Food Trade', *Global Food Security* 12, 139–145.

Amiti, M., M. Dai, R. Feenstra, and J. Romalis (2020) 'How did China's WTO Entry Affect US Prices?', *Journal of International Economics* 126, 103339.

Amiti, M., S.J. Redding, and D.E. Weinstein (2020) 'Who's Paying for the US Tariffs? A Longer-Term Perspective', *AEA Papers and Proceedings* 110, 541–546.

Anderson, K., J. Huang, and E. Ianchovichina (2004) 'The Impacts of WTO Accession on Chinese Agriculture and Rural Poverty', in D. Bhattasali, S.T. Li, and W. Martin (eds.), *China and the WTO: Accession, Policy Reform, and Poverty Reduction Strategies*. Washington, DC: World Bank and Oxford University Press, 101–116.

Autor, D., D. Dorn, and G. Hanson (2013) 'The China Syndrome: Local Labor Market Effects of Import Competition in the United States', *American Economic Review* 103(6), 2121–2168.

Bagwell, K. and R. Staiger (2016) 'The Design of Trade Agreements', in K. Bagwell, and R. Staiger (eds.), *Handbook of Commercial Policy Volume 1A*. Amsterdam: Elsevier, 435–529.

https://doi.org/10.1017/S1474745622000271 Published online by Cambridge University Press

Baldwin, R. (2016) *The Great Convergence: Information Technology and the New Globalization*. Cambridge, MA: Harvard University Press.
Bellora, C. and L. Fontagné (2019) 'Shooting Oneself in the Foot? Trade War and Global Value Chains', Working Paper 2019-18, CEPII, Paris.
Bergsten, C.F. (2022) *The United States vs China: The Quest for Global Economic Leadership*. Washington, DC: Peterson Institute for International Economics.
Bhattasali, D., S.T. Li, and W. Martin (2004) *China and the WTO: Accession, Policy Reform, and Poverty Reduction Strategies*. Washington, DC: World Bank and Oxford University Press.
Bouët, A. and D. Laborde (2018) 'US Trade Wars with Emerging Countries in the 21st Century: Make America and its Partners Lose Again', *The World Economy* 41(9), 2276–2319.
Bown, C. (2022) 'China Bought None of the Extra $200 Billion of US Exports in Trump's Trade Deal', PIIE Blog, 8 March, www.piie.com/blogs/realtime-economic-issues-watch/china-bought-none-extra-200-billion-us-exports-trumps-trade.
Bown, C. and D. Irwin (2019) 'Trump's Assault on the Global Trading System: And Why Decoupling from China will Change Everything', *Foreign Affairs* 98(5), 125–136.
Bown, C. and M. Kolb (2022) 'Trump's Trade War Timeline: An Up-to-Date Guide', Washington DC: Peterson Institute for International Economics, updated March 22. www.piie.com/sites/default/files/documents/trump-trade-war-timeline.pdf.
Buckley, C. and L. Friedman (2021) 'Climate Change is "Not a Geostrategic Weapon", Kerry Tells Chinese Leaders', *New York Times*, updated 22 September, www.nytimes.com/2021/09/02/world/asia/climate-china-us-kerry.html
Cui, L.B., L. Zhu, M.L. Song, and H.T. Zheng (2018) 'The Economic Evaluation of China–US Trade Frictions', *Journal of Finance and Economics* 44(12), 5–18.
Dixon, J. (2017) 'The Impact on Australia of Trump's 45 Percent Tariff on Chinese Imports', *Economic Papers* 36(3), 266–274.
Feenstra, R.C. and C. Hong (2020) 'China's Import Demand for Agricultural Products: The Impact of the Phase One Trade Agreement', NBER Working Paper, No. 27383.
Feng, L., Z. Li, and D. Swenson (2017) 'Trade Policy Uncertainty and Exports: Evidence from China's WTO Accession', *Journal of International Economics* 106, 20–36.
Fewsmith, J. (2001) 'The Political and Social Implications of China's Accession to the WTO', *China Quarterly* 167, 173–191.
Flaaen, A. and J. Pierce (2020) 'Disentangling the Effects of the 2018–19 Tariffs on a Globally Connected US Manufacturing Sector', Finance and Economics Discussion Paper 2019-086, updated November 2020, http://www.justinrpierce.com/.
Flaaen, A., K. Langemeier, and J. Pierce (2021) 'Factors Affecting Recent US Tariffs on Imports from China', FEDS Notes 2021-02-17, Board of Governors of the Federal Reserve System (US).
Fouré, J., A. Bénassy-Quéré, and L. Fontagné (2013) 'Modelling the World Economy at the 2050 Horizon', *Economics of Transition* 21(4), 617–654.
Francois, J. and D. Spinanger (2004) 'WTO Accession and the Structure of China's Motor Vehicle Sector', in D. Bhattasali, S.T. Li, and W. Martin (eds.), *China and the WTO: Accession, Policy Reform, and Poverty Reduction Strategies*. Washington, DC: World Bank and Oxford University Press, 191–210.
Freund, C., M. Maliszewska, A. Mattoo, and M. Ruta (2020) 'When Elephants Make Peace the Impact of the China–US Trade Agreement on Developing Countries', Policy Research Working Paper 9173. Washington, DC: World Bank.
Glauber, J. (2020) 'US Trade Aid Payments and the WTO', *Applied Economic Perspectives and Policy* 43(2), 586–603.
Guo, M.X., L. Lu, L.G. Sheng, and M.J. Yu (2018) 'The Day After Tomorrow: Evaluating the Burden of Trump's Trade War', *Asian Economic Papers* 17(1), 101–120.
Haberman, M. (2016) 'Donald Trump Says He Favors Big Tariffs on Chinese Exports', *The New York Times*, 7 January 2016), www.nytimes.com/politics/first-draft/2016/01/07/donald-trump-says-he-favors-big-tariffs-on-chinese-exports.
Hertel, T.W. (1997) *Global Trade Analysis: Modeling and Application*. New York: Cambridge University Press.
Huang, J., Y. Liu, W. Martin, and S. Rozelle (2009) 'Changes in Trade and Domestic Distortions Affecting China's Agriculture', *Food Policy* 34(5), 407–416.
Ianchovichina, E. and W. Martin (2001) 'Trade Liberalization in China's Accession to WTO', *Journal of Economic Integration* 16(4), 421–445.
IMF (2022) *World Economic Outlook,* April 2022.
Irwin, D. (2011) *Trade Policy Disaster: Lessons from the 1930s*. Cambridge, MA: MIT Press.
Johnson, K. (2020) 'What Trump Really Doesn't Get About Trade', Foreign Policy, https://foreignpolicy.com/2020/02/24/trump-trade-war-china-europe-deficit/
Laborde, D., W. Martin, and D. van der Mensbrugghe (2017) 'Measuring the Impacts of Global Trade Reform with Optimal Aggregators of Distortions', *Review of International Economics* 25(2), 403–425.
Li, M., E. Balistreri, and W. Zhang (2020) 'The US–China Trade War: Tariff Data and General Equilibrium Analysis', *Journal of Asian Economics*, 101216. August. doi:10.1016/j.asieco.2020.101216
Li, S., C. Pan, L. Zhou, Z. Tang, and J. He (2021) 'The Impacts of China–US Trade Friction on Global economy and China's Subnational Economy', Paper for the 24th Global Economic Analysis Conference, GTAP resource #6252.
Martin, W. (1997) 'Measuring Welfare Changes with Distortions', in J. Francois and K. Reinert (eds.), *Applied Methods for Trade Policy Analysis: A Handbook*. Cambridge: Cambridge University Press, 76–93.

Pangestu, M. and D. Mrongowius (2004) 'Telecommunications Services in China: Facing the Challenges of WTO Accession', in D. Bhattasali, S.T. Li, and W. Martin (eds.), *China and the WTO: Accession, Policy Reform, and Poverty Reduction Strategies*. Washington, DC: World Bank and Oxford University Press, 157–180.

Posen, A. (2021) 'The Price of Nostalgia: America's Self-Defeating Economic Retreat', Foreign Affairs, May/June, 28–34.

Reuters Staff (2018) 'Trump Tweets: "Trade Wars Are Good, and Easy to Win"', Reuters, 3 March 2018, www.reuters.com/article/us-usa-trade-trump-idUSKCN1GE1E9.

Rodrik, D. (2016) 'Premature Deindustrialization', *Journal of Economic Growth* 21, 1–33.

Rosyadi, S.A. and T. Widodo (2018) 'Impact of Donald Trump's Tariff Increase against Chinese Imports on Global Economy: Global Trade Analysis Project (GTAP) Model', *Journal of Chinese Economic and Business Studies* 16(2), 125–145.

US Trade Representative (2018) 'Notice of Action and Request for Public Comment', *Federal Register* 83(119), https://ustr.gov/sites/default/files/2018-13248.pdf

Walmsley, T., B. Dimaranan, and R. McDougall (2000) '*A Base Case Scenario for the Dynamic GTAP Model*', Center for Global Trade Analysis. West Lafayette: Center for Global Trade Analysis, Purdue University.

Walmsley, T., A. Aguiar, and B. Narayanan (2012) 'Introduction to the Global Trade Analysis Project and the GTAP Data Base', GTAP Working Paper, No. 67.

World Bank (1994) *China Foreign Trade Reform*. Washington, DC: World Bank.

Zhou, Z.N. and X.L. Shi (2019) 'The Impact of Trade Friction Between China and the US: An Analysis Based on Dynamic GTAP Model', *International Economics and Trade Research* 35(2), 21–32.

Zhou, S.D., J. Zheng, and X. Lu (2019) 'The Impact of Sino-US Trade Disputes on China's Major Agricultural Sectors', *Journal of Nanjing Agricultural University (Social Sciences Edition)* 19(1), 130–141.

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