# The evolution of trade barriers in the 21st century

James Lake*
University of Tennessee

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## 1 Introduction

According to *The Economist*, the first two decades of the 21st century contrast starkly with each other. On the one hand, the 2000s was a "golden age of globalization" that was "something to behold". On the other hand, the 2010s saw globalization slow from "light speed to a snail's pace". This entry takes a holistic view of trade barriers to include tariff and non-tariff barriers. It describes how they have changed this century, some causes and important consequences of these changes, and suggests how they will change in coming decades.[1]

## 2 21st century liberalization

Trade barriers encompass a wide variety of policy and non-policy tools. I focus on policy tools including various types of non-discriminatory and discriminatory tariffs, as well as non-tariff barriers that include regulations and standards intended to restrict imports coming into or exports leaving a country.[2]

Tariffs are the traditional trade policy tool. Various rounds of multilateral tariff negotiations under the General Agreement on Tariffs and Trade (GATT) during the mid-late 1900s dramatically reduced the non-discriminatory (i.e. MFN) tariffs applied by developed

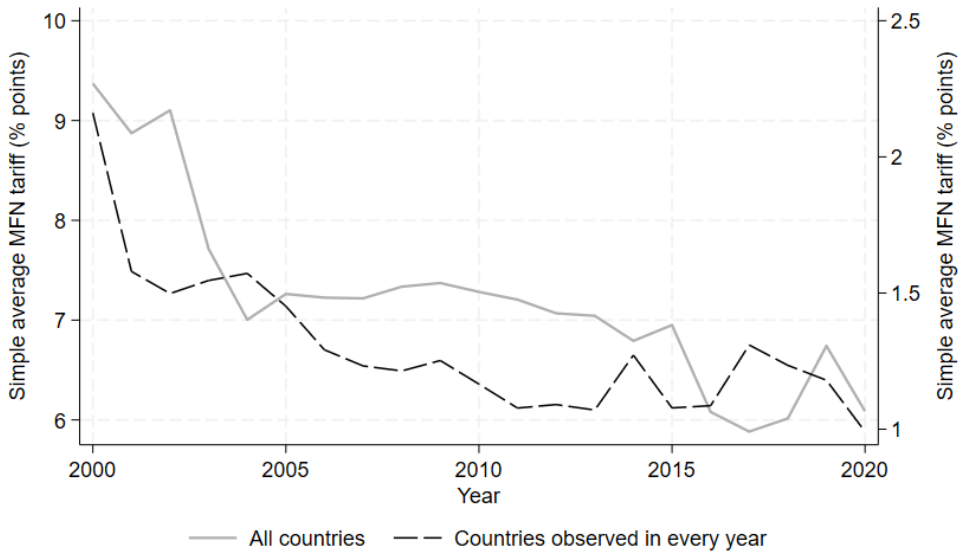
*E-mail: jlake7@utk.edu. Manuscript prepared for the *Elgar Encyclopedia of International Trade*. Thanks to Maurizio Zanardi for helpful discussion on anti-dumping duties.

[1] See Bown and Crowley (2016) for a broader discussion of the trade policy landscape for a period ending in 2013.

[2] On the non-policy side, transport costs and other geographical-related frictions dampen trade.

countries and eventually, but to a lesser extent, developing countries.[3] The phase in of 1994 Uruguay Round tariff concessions was still taking place, especially for developing countries, during the early 2000s. Figure 1 shows the global average MFN tariff still fell from 9.4% to 7.0% between 2000 and 2004 but remained steady around 7% until 2015. Focusing on the subset of countries where tariff data is available for every year 2000-2020, the average tariff fell from 2.54% to 1.58% from 2000 to 2006 but remained relatively stable from 2006 onward.

**Figure 1:** Simple average MFN applied tariff



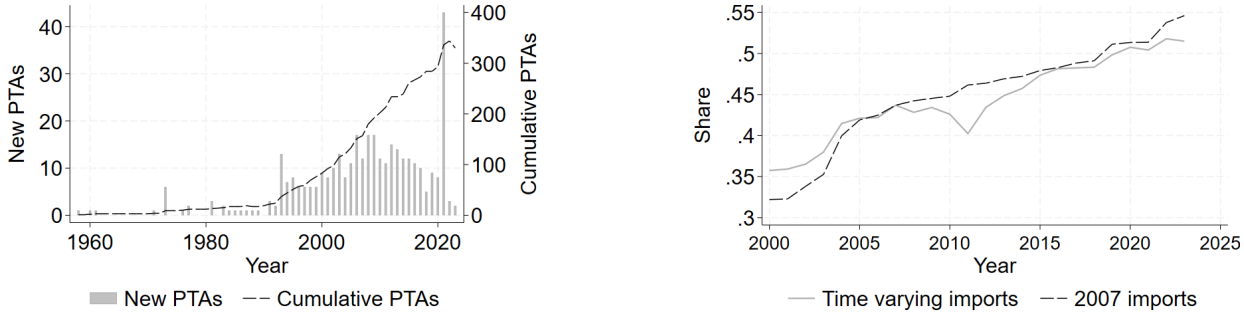

**Notes**: Data obtained from TRAINS via the WITS. Some countries do not report tariffs in some years.

Quickly following the highly successful Uruguay Round, the prospects for further large-scale multilateral liberalization were dim and have remained so. Against this backdrop, preferential trade agreements (PTAs) proliferated. According to WTO rules, PTAs eliminate tariffs among members on substantially all trade (the requirement is looser for PTAs between developing countries). Figure 2a shows six new PTAs started in 1999 and it was not until 2018 when fewer PTAs started. In addition, 10-20 PTAs started each year between 2005 and 2017 and lifted the number of PTAs from 76 in 1999 to 284 in 2019. These PTAs also cover a large share of world trade. Using 2007 imports, Figure 2b shows the share of world imports covered by PTAs increased about 70% from 32.2% in 2000 to 54.6% in 2023.

In general, PTAs have not dissolved. The main exception is the "Brexit" situation in which the United Kingdom (UK) left the PTA constituted by members of the European

[3]In the Uruguay Round, countries negotiated tariff bindings which are upper bounds on tariffs and not tariff levels themselves. Substantial gaps between the bindings and applied tariffs (i.e. binding overhang) still exists.

**Figure 2:** Proliferation of PTAs




**(a)** PTA formation **(b)** World imports covered by PTAs

**Notes**: PTA data obtained from World Bank's Deep Trade Agreement Database. Import data obtained from COMTRADE via its API using the comtradr command in R. Some countries do not report imports in some years. 2011 is an outlier year where numerous countries that participate in many PTAs do not report imports.

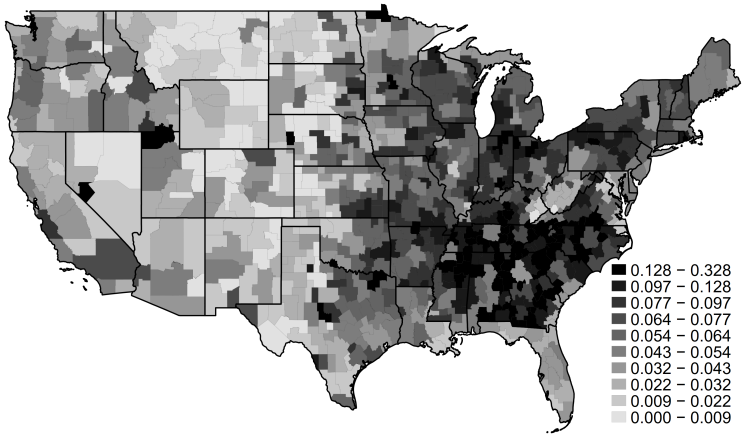
Union (EU). Moreover, by definition, the UK lost all PTA partners that had a PTA with the EU upon Brexit. The 2021 dramatic spike in new PTAs reflects the UK forming its own PTAs, including many PTAs with EU PTA partners. Thus, Brexit barely affected the share of world imports covered by PTAs.

In contrast to previous rounds of multilateral tariff concessions and PTAs, China's entry into the WTO precipitated various policy changes involving China. First, China drastically cut tariffs imposed on its imports. Second, WTO members now had to set the same tariffs on China as on other WTO members. For example, the US granted China "permanent normalization of trade relations" by which they no longer decided on an annual basis whether to grant MFN tariffs to China. Although it never occurred, the alternative in any year was the generally far higher tariffs from the 1930s Smoot-Hawley era of US tariffs. Weighted by location-industry level employment, Figure 3 shows large average gaps between these tariffs (the "NTR gap") reaching 13%-33% points in the upper decile of locations and 5.5% points at the median. Indeed, the share of US imports from China more than tripled from 6.47% in 2000 to 20.8% in 2018 and the effect resulting from reduced tariff uncertainty has been estimated as equivalent to a permanent 5% point tariff cut (Fajgelbaum and Khandelwal, 2022; Caliendo and Parro, 2023).

# 3 21st century protection

Despite the above-documented global tariff liberalization, protection has been gaining steam. The most dramatic episode is the trade war initiated by the Trump administration in 2018.

**Figure 3:** County-level NTR gap



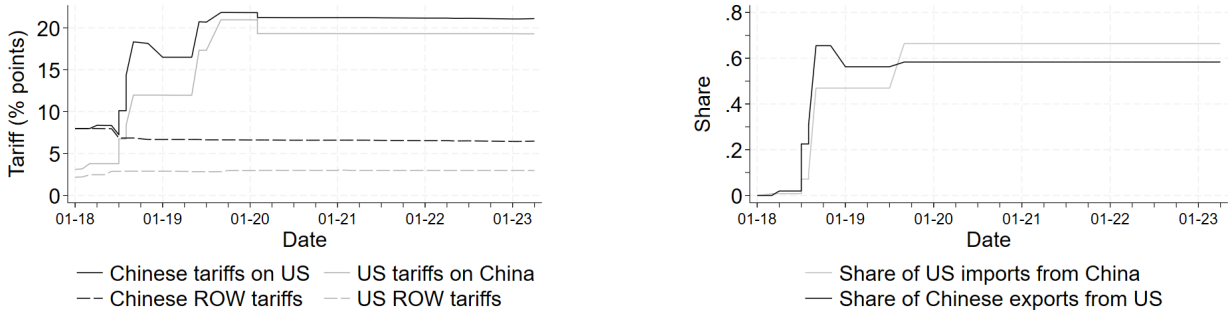

**Notes**: Data obtained from Greenland et al. (2019). The NTR gap is defined as the difference between column 1 and column 2 US tariffs in 2000.

This began as US tariffs on countries around the world in the form of WTO-permitted safeguard tariffs on solar panels and washing machines and so-called national security tariffs on steel and aluminum that were eventually ruled illegal by the WTO. But it quickly morphed into, largely, a US-China trade war over China allegedly abusing the intellectual property rights of US firms operating in China.

Figure 4 illustrates the extent of this trade war. Figure 4a shows the average US tariff on Chinese imports in January 2018 before the trade war was 3.1% compared to its average tariff on imports from the rest of the world (ROW) of 2.2%. At that time, China imposed the same average tariff on US and ROW imports of 8.0%. But by early 2020, which essentially reflects the current state of the trade war in September 2024, the average US tariff on Chinese imports far exceeded that of ROW imports – 19.3% versus 3.0% – and similarly for China – 20.7% versus 6.1%. Further, Figure 4b shows these tariffs cover 60-70% of US-China bilateral trade. And, since China accounted for over 20% of pre-trade war US imports, the average US tariff nearly tripled from its pre-trade war level of 2.36% to 6.33% by early-2020.

The distributional effects of liberalization in previous decades are an important reason for this surge in US protectionism. Traditional economic theory emphasizes the negative distributional effects of liberalization for some kinds of workers, either because they find it difficult to move out of the import-competing sector (a specific factors model story) or because the contracting import-competing sector dramatically reduces the demand for their skills (a Heckscher-Ohlin story). But, the overall narrative of trade economists and policy makers emphasized the gains to consumers and the presumed ability of the economy to swiftly reallocate displaced workers to the expanding exportable sector or to non-tradable sectors. Trade economists expected little effect on aggregate employment.

**Figure 4:** Trade war tariffs and import coverage




**(a)** Trade war tariffs

**(b)** US-China trade war import coverage

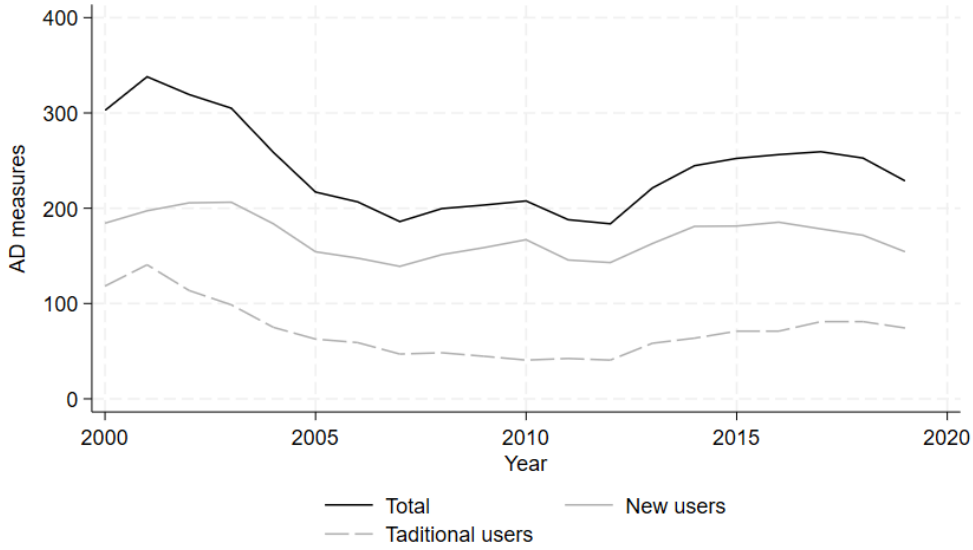
**Notes**: Data obtained from *US-China trade war tariffs: An up-to-date chart* developed by Chad Bown for the Peterson Institute of International Economics. ROW stands for rest of the world. Panel (b) shows the share of US (Chinese) imports from China (the US) subject to US (Chinese) trade war tariffs on China (the US).

By the early-mid 2010s, a body of empirical research was taking off that documented large-scale negative consequences of liberalization for certain groups of workers. It particularly emphasized the consequences for workers in geographical locations highly exposed to liberalization due to the industrial composition of their workforce. Autor et al. (2016) and Caliendo and Parro (2023) review the labor market adjustment effects in the US due to China's remarkable emergence as a 21st century global export powerhouse. More broadly, together with Goldberg and Pavcnik (2016), they also discuss how similar results have been found in many other countries around the world and also in the US context during the mid-late 1990s following the implementation of NAFTA (North American Free Trade Agreement). Put simply, and capturing the essence of this literature, Autor et al. (2016) say "Adjustment in local labor markets is remarkably slow, with wages and labor-force participation rates remaining depressed and unemployment rates remaining elevated for at least a full decade after the China trade shock commences."

Rodrik (2021) argues these negative distributional consequences for US workers are crucial underpinnings for the recent bout of US protectionism. In particular, he argues these consequences laid the groundwork for the public acceptance of a protectionist political platform and the political space for Trump to run as a protectionist politician in a Republican party that had strongly supported a free trade agenda for many decades. For example, focusing on a group of voters crucial to Trump's 2016 election victory, Rodrik (2021) shows that 2012 Obama voters who switched and voted for Trump in 2016 were more hostile towards free trade and in a more vulnerable financial position.

Before the recent trade war, anti-dumping (AD) duties were the most common WTO-permitted tool of protection. In principle, these duties impose tariffs on foreign exporters to

**Figure 5:** Anti-dumping measures




**Notes**: Data obtained from the World Bank's Temporary Trade Barrier Database. Vertical axis is the three-year moving average for the count of AD measures. Traditional users defined as the US, EU, Canada and Australia. New users defined as all other countries.

ensure they do not "dump" their product in the importing country at below cost. Regardless of whether considering "traditional" or "new" countries using AD duties, Figure 5 shows the three-year moving average of AD measures fell considerably between 2000 and 2007: by 38.5% overall, 60% for traditional users, and 24.5% for new users. However, the three-year moving average increased substantially between 2012 and 2017: by 34.4% overall, 99% for traditional users, and 20% for new users. A natural hypothesis in the literature is that this reflects a substitution toward WTO permissible protection in the face of multilateral tariff concessions and PTAs substantially constraining unilateral tariffs.

Indicative of a more general substitution away from tariffs towards other trade barriers is the growing worldwide use of non-tariff measures (NTMs, also often referred to as non-trade barriers (NTBs)). Naturally, NTMs cover a wide range of trade barriers. Table 1 provides descriptions and examples for types of NTMs. Focusing on NTMs imposed by the importing country, Figure 6a shows SPS and TBTs are easily the most prevalent types of NTMs and their use roughly tripled from 2001 to 2019. Figure 6b also shows a stark increase in the share of world imports covered by an NTM – the so-called NTM "coverage ratio" – from 21.4% in 2001 to slightly over 50% in 2019. Despite the prevalence of SPS just described, the share of world imports covered by an SPS is far less than covered by a TBT, slightly less than that covered by quantitative or price controls, and only slightly more than that covered by pre-shipment inspections.

**Table 1. Types of non-tariff measures (NTMs)**

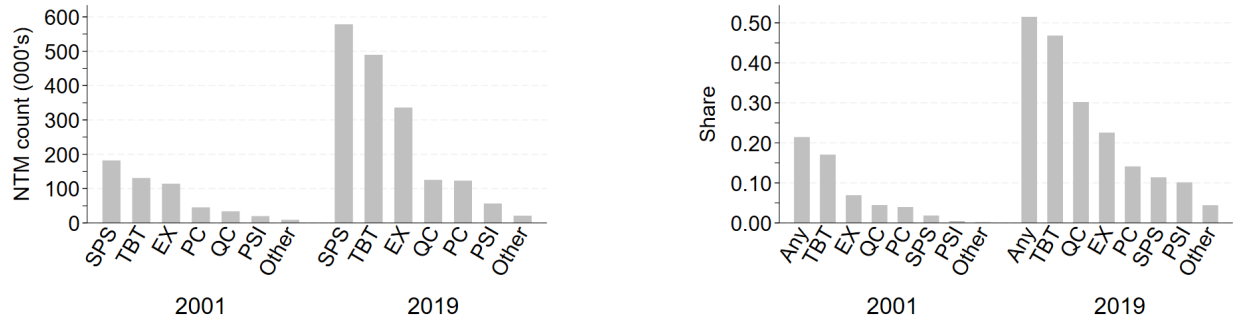
| | NTM type | Ch. | Description | Examples |
|---|---|---|---|---|
| SPS | Sanitary & phytosanitary measures | A | Measures applied to protect human or animal life from risks arising from: additives, contaminants, toxins or disease-causing organisms in food. | A requirement limiting the use of hormones and antibiotics in the production of meat.<br>Sample test on imported oranges for residue level of pesticides. |
| TBT | Technical barriers to trade | B | Measures referring to technical regulations, and procedures for assessment of conformity with technical regulations and standards. | Restrictions on toxins in children's toys.<br>Refrigerators need to carry a label indicating their size, weight and electricity consumption level. |
| PSI | Pre-shipment inspections | C | | Live animals must be cleared at a designated customs office.<br>Goods must be shipped directly from the country of origin (without stops). |
| QR | Quantitative restrictions | E | Measures intended to prohibit or restrict imports (including, e.g., licenses, quotas, prohibitions, voluntary export restraints, tariff rate quotas) | Imports of strawberries are not allowed from March to June of each year.<br>Annual quota of 300 tons of seaweed. |
| PC | Price controls | F | Measures intended to control or affect prices of imported goods | Carbon dioxide emission charge on motor vehicles.<br>Customs inspection fees. |
| Fin | Finance measures | G | Measures intended to regulate access to and cost of foreign exchange for imports and terms of payment | 100% payment of estimated customs duty required three months before expected arrival of goods at port of entry.<br>Imports of textile materials authorized only if importer can pay exporter directly with foreign exchange obtained in export activity abroad. |
| Comp | Measures affecting competition | H | Measures granting exclusive or special preferences or privileges to one or more limited groups of economic operators | A requirement that imports must be insured by a national insurance company.<br>The state petroleum board is the only entity permitted to import and distribute petroleum. |
| TRIMs | Trade-related investment measures | I | | At least 50% of components value must be locally produced.<br>Company cannot import materials exceeding 80% of prior year exports. |
| Export | | P | Measures applied to exported goods by the government of the exporting country. | The exportation of corn is prohibited because of a shortage in domestic consumption.<br>Export duty on crude petroleum. |

**Notes:** Source is *Internationa Classification of non-tariff measures: 2019 version* published by the United Nations Conference on Trade and Development. Chapters refer to the International Classification of Non-tariff Measures.

Figure 7 shows country-level changes in the coverage ratio between 2001 and 2019. Each panel uses the same scale so that the overall notably darker colors in panel (b) reflect the global increase in NTM usage. In this regard, the US is an outlier with its coverage ratio only modestly increasing from 62.7% to 79.7%. Among the largest increases were the major economies of Brazil (25.9% to 96.3%), Japan (9.9% to 75.4%), Russia (25.7% to 82.1%) and China (42.7% to 93.5%) as well as smaller economies in the regions of central Asia and central America.

Calculating so-called "Trade Restrictiveness Indices" (TRIs) is one well-known approach to quantify the protection provided by a structure of trade barriers and make comparisons across countries. The TRI is the uniform tariff that delivers the same welfare as the ob-

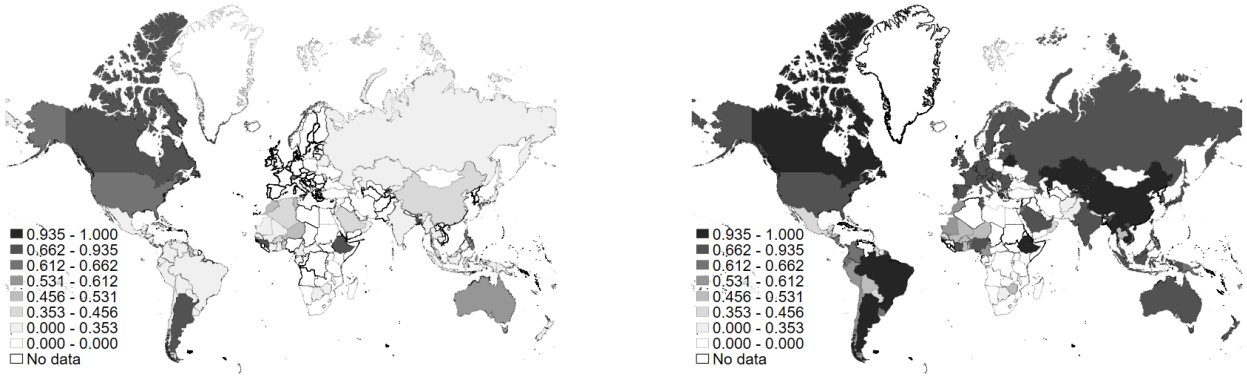
**Figure 6:** Growth in usage of non-tariff measures (NTMs)




**(a)** NTM count **(b)** World imports covered by an NTM

**Notes**: Data obtained from TRAINS Portal. See Table 1 for abbreviations of NTM types on horizontal axes. In panel (b), "Any" refers to any type of NTM.

**Figure 7:** Growth in country-level usage of NTMs




**(a)** 2001 **(b)** 2019

**Notes**: Data obtained from TRAINS Portal. See Table 1 for abbreviations of NTM types on horizontal axes.

served structure of trade barriers, which can include both tariffs as well as NTMs if one has advalorem-equivalent measures of NTMs. Following the methodology of Kee et al. (2009) who report TRIs using tariffs and NTMs for a cross-section of countries in 2003, Agnimaruto et al. (2023) show that the median TRI increased more than a quarter from approximately 35% in 2003 to approximately 47% in 2018.

# 4 Effects of changes in trade barriers

Changes in trade barriers affect economic outcomes in the importing country by altering domestic prices. Trade liberalization should benefit consumers of importable goods through lower prices, but could hurt certain workers exposed to rising import competition due to

their industry or location of employment or the kinds of skills they possess.

As described above, a large body of recent literature has emphasized the negative impacts of trade liberalization on wages and employment for exposed workers around the world (Autor et al., 2016; Goldberg and Pavcnik, 2016; Caliendo and Parro, 2023).[4] However, surprisingly, Goldberg and Pavcnik (2016) and Fajgelbaum and Khandelwal (2022) describe the set of papers analyzing the effect of tariff liberalization on domestic prices as relatively small despite these papers generally finding incomplete pass through: while domestic prices fell, they fell proportionately less than tariffs.

The trade war initiated by the Trump administration gave academic researchers an opportunistic case study to investigate the pass through of tariffs to prices. Because the US and China account for a large share of world imports, at least for certain products, they should face upward sloping export supply curves. If so, their tariffs should depress the price received by the exporter and thereby pass through less than proportionately to their domestic prices. However, surprisingly, Fajgelbaum and Khandelwal (2022) and Caliendo and Parro (2023) describe a series of papers that has found complete pass-through. This applies to domestic US prices following US trade war tariffs on the rest of the world and to domestic Chinese prices following Chinese trade war tariffs on the US. Overall, both the pre-trade war and trade war literatures show domestic prices moving with tariff changes.

The higher domestic prices of importable goods in both the United States and China have associated distributional effects within each country. Translating higher prices into real income losses for consumers and gains for producers as a share of US GDP, Fajgelbaum and Khandelwal (2022) document a loss of 0.58% for US consumers and a gain of 0.13% for US producers. Caliendo and Parro (2023) discuss how the trade war boosted employment in some sectors like metals, which saw national security tariffs on steel and aluminum, together with furniture as well as computers and electronics, which both saw large 2000s import growth from China. But, they also discuss lower employment in some sectors including textiles. They actually describe an overall small *decrease* in manufacturing employment. This is especially true in states such as California and Texas despite manufacturing employment increases in some other states including Mississippi and Alabama. Unsurprisingly given the extent of tariff pass through to domestic prices, academic studies have all found overall welfare losses for the US.

Importantly, consumers in the context of the trade war tariffs (and tariffs more generally) are not only final consumers. Indeed, the majority of US trade war tariffs are on intermediate inputs and capital goods, which implies the consumers of these goods are US

[4]See Goldberg and Pavcnik (2016) for further discussion of the effects of trade liberalization on a host of variables.

firms. Thus, these tariffs represent higher costs for many US firms and a drag on their global competitiveness. As discussed by Caliendo and Parro (2023), firms affected by trade war tariffs on their inputs account for 84% of 2016 US exports and 65% of 2016 US manufacturing employment. Although many of these firms also benefited from higher US tariffs on their output, Caliendo and Parro (2023) discuss evidence that any such effect was generally outweighed by higher tariffs on their inputs and retaliatory tariffs reducing their access to foreign markets. Outside the context of the recent trade war, Lake and Liu (2024) show large negative effects on employment in industries heavily relying on steel as an intermediate input following the steel "safeguard" tariffs imposed by President Bush in 2002.

# 5 Concluding discussion

At the dawn of the 21st century, the likelihood of protection reemerging within two decades as the go-to stance for both major US political parties and, more generally, gaining substantial voter and political popularity around the world seemed unlikely. The world had just witnessed a highly successful and transformative round of multilateral trade negotiations that included creation of the World Trade Organization (WTO), substantial cuts in global tariffs, the establishment of a dispute settlement process, and rules governing global trade in services and intellectual property. A wave of Preferential Trade Agreements was swelling. And center-left political parties were joining center-right political parties in their support for globalization. So how did the world get to the current juncture, and where will it go?

Key to understanding the apparent 180-degree turn in the policy landscape is that trade policy inherently brings distributional consequences. Although trade liberalization may create gains to the winners in the importing country that exceed losses to the losers, the losses to the losers are real, they are often very large for the affected individuals, and they are often concentrated in certain industries and regions of the country. Despite essentially all public policies having similar features, as does the ever-present process of technological change, the effects of trade policy and trade policy itself can easily be cast as an "us versus them" issue. As Rodrik (2021) argues, the combination of these two realities can rationalize the growing backlash against globalization since 2000 and especially the dramatic move of right-wing political parties from free-trade purists to free-trade skeptics.

Where will the world go from here? Three reasons suggest more of the same: a largely globalized world with certain cracks that lead to protection, but in ways that do not break the overall system.

First, the dramatic unilateral and often discriminatory use of tariffs by the Trump administration raised fears that other countries would follow suit. For example, each country

could essentially redefine "national security" to mean "economic security" and use this as a catch all justification for any protectionist trade policy. However, this has not happened. The global rule-based trading system has survived a massive scare.

Second, like many other redistributive policies, new trade barriers are proving difficult to remove politically after implementation. While it seems unlikely a Clinton-led administration would have imposed the Trump administration's raft of tariffs, the Biden administration essentially left them in place and it seems a Harris administration would do the same. Moreover, the increasing use of NTMs suggests a new front for the global trading system's goal of incentivizing countries to refrain from shifting the costs of their redistributive policies onto the rest of the world.

Third, unlike tariffs on steel and aluminum in the name of national security, the coming years may see a genuine rationale for trade policy in the name of national security. The US sees Chinese dominance in the global 5G telecommunications ecosystem (including 5G infrastructure like base stations and cell towers) as creating national security risks for the US through the possibility of Chinese cybercrimes, spying, and industrial espionage along the global information super highway. The strength of this threat is markedly elevated by the blurred lines between private commercial activity and state intervention created by the Chinese government policy of "military-civil fusion". Through this policy, the Chinese government encourages private Chinese companies to work collaboratively with the state to modernize the Chinese military. These concerns have already led to substantial US export controls intended to cut off the supply to China of advanced semiconductors that are important inputs into 5G technology. To the extent that these trade barriers violate WTO rules of non-discrimination, the US appears willing to accept any equivalent trade policy retaliation by China (i.e. a withdrawal of "equivalent concessions" in the confines of the WTO system).

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