CHAPTER 1

The Empirical Landscape of Trade Policy

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Abstract

This chapter surveys empirically the broad features of trade policy in goods for 31 major economies that collectively represented 83% of the world's population and 91% of the world's GDP in 2013. We address five questions: Do some countries have more liberal trading regimes than others? Within countries, which industries receive the most import protection? How do trade policies change over time? Do countries discriminate among their trading partners when setting trade policy? Finally, how liberalized is world trade? Our analysis documents the extent of cross-sectional heterogeneity in applied commercial policy across countries, their economic sectors, and their trading partners, over time. We conclude that substantial trade policy barriers remain as an important feature of the world economy.

Keywords

Tariffs, MFN, Preferences, Quantitative restrictions, Temporary trade barriers, Antidumping, Safeguards, Nontariff barriers

JEL Classification codes

F02, F13, F14, F15, H21, H23, K33, L5, N4, N70

1. INTRODUCTION

This chapter surveys the broad features of and developments in the use of trade policy across countries, within countries, and over time. Our goal is to describe and, whenever possible, quantify the extent of cross-sectional heterogeneity in applied commercial policy across countries, their economic sectors, and their trading partners, over time.[a] We construct a relatively comprehensive picture of trade policy for 31 economies that represented 83% of the world's population and 91% of the world's GDP in 2013. Our main conclusion is that substantial trade policy barriers remain as an important feature of the world economy today.

As a starting point, we must define what we mean by a trade policy "barrier." As we will illustrate, there is an ever-increasing set of policy instruments that both researchers

[a] This paper builds from a number of previous *Handbook* chapters describing various elements of how trade policy is used in practice, and notably Feenstra (1995), Rodrik (1995), Staiger (1995), and Maggi (2014).

and trade negotiators would like to better understand because they are perceived to have a trade-restricting effect. Until recently, researchers have had little information about border policy instruments. Indeed, as Anderson and van Wincoop noted: "[t]he grossly incomplete and inaccurate information on policy barriers available to researchers is a scandal and a puzzle" (Anderson and van Wincoop, 2004, p. 693). The good news is that research no longer needs to operate behind a veil of ignorance created by the lack of information on border barriers; product-level data on many of the important trade policy instruments imposed at the border are now routinely being made available for most economies in the world.[b]

The picture of the empirical landscape of trade policy that emerges is complex, with substantial variation along some dimensions and little variation along others. We frame our assessment of this trade policy variation by centering our analysis around five main questions:

1. Do some countries have more liberal trading regimes than others?
2. Within countries, which industries receive the most import protection?
3. How do trade policies change over time?
4. Do countries discriminate across their trading partners when setting trade policy?
5. How liberalized is world trade?

As we examine each question, we document heterogeneity in trade policy arising along important dimensions.[c] Whenever possible, we also comment on the factors that are understood as driving this variation. Here, we offer five brief answers, with a promise to expand on them in the coming pages.

Question 1: Do some countries have more liberal trading regimes than others?

Yes, there are large differences across countries in the average level of import tariffs. High-income countries have more liberal regimes than middle income countries which, in turn, have more liberal regimes than low income countries. To this broad picture we add two more subtle observations. High-income countries appear even more open when we expand the set of policies to include preferential tariffs on imports that they offer to selected trading partners. On the other hand, both high-income and emerging economies appear less open when we expand the set of policies beyond tariffs to include policies such as temporary trade barriers and quantitative restrictions.

Question 2: Within countries, which industries receive the most import protection?

With respect to import tariffs, agricultural products and foodstuffs are protected almost everywhere, regardless of a country's level of development. Textiles, apparel

[b] Our survey is limited to policy barriers to goods trade only and thus does not address services.

[c] An alternative approach that we do not pursue is the theoretically-grounded Trade Restrictiveness Index (TRI) measures of Anderson and Neary (1992, 1996). The TRI collapses within-country, cross-sector variation into a single measure that can be compared across countries; it has been implemented empirically, for example, in Kee et al. (2009). However, the TRI does not capture many of the aspects of the inter-temporal and cross-trading partners variation in trade policy that we describe throughout this chapter.

and footwear are more protected than other manufactured goods. Minerals and fuels tend to face few import barriers. Furthermore, import tariffs on final goods are higher than those on intermediates in all sectors, everywhere. When expanding the policy set beyond tariffs, however, the sector-level variation in import protection levels becomes much more muddled.

Question 3: How do trade policies change over time? Are countries consistently liberalizing, or are there reversals?

Over the last 20 years, tariffs have been trending down around the world. Among high-income countries, changes in applied tariffs are mostly stable around this trend; there is a bit more fluctuation for lower income countries. However, this broad trend is partially deceiving for many high income and emerging economies; they have switched from tariffs toward antidumping and safeguards policies to implement higher frequency changes to their levels of import protection.

Question 4: Do countries discriminate across their trading partners when setting trade policy? If so, by how much?

The short answer to the first part of this question is yes. Many countries discriminate across trading partners by offering *lower* levels of import protection—ie, lower applied tariffs that provide more favorable market access to preferred trading partners relative to the nondiscriminatory tariffs offered under multilateral agreements. On the other hand, many countries discriminate across trading partners by imposing *higher* levels of import protection—ie, antidumping import restrictions designed to limit the market access of particular trading partners, including new entrants such as China. Answering the second part of this question is much more difficult.

Question 5: How liberalized is world trade?

In historical context, the answer is probably a lot relative to previous eras. However, it is much less liberalized than many economists probably realize, especially when taking into account border barriers beyond tariffs. Finally, very little is known about how "liberalized" world trade is once we expand the analysis and consider potential trade-restricting effects of behind-the-border policies.

In our attempts to answer these five questions, three important themes emerge.

First, trade is restricted through the use of many different policy tools. The fundamental dichotomy in the lexicon of import policies has been between price-based measures (import tariffs) and quantity-based measures (quotas). However, a variety of specialized categories have arisen within these broad classes. The development of trade agreements has played an important role in both constraining access to certain policies, and yet also making other policies more readily available under certain types of legal-economic conditions. The result is an extensive variety of policies in use at any moment in time. Moreover, across countries and sectors, the trade regime can exhibit extensive heterogeneity in the level of restrictiveness. Including all border policy barriers is thus likely to be important; for example, in their major contribution to estimating the *combined*

restrictiveness of various trade policies using data from the late 1990s and early 2000s, Kee et al. (2009) conclude that restrictiveness measures that include nontariff barriers are 87% higher on average than measures based on tariffs alone.

A second emerging theme is that history tends to repeat itself. While some of the most popular forms of border policies have changed over the decades since World War II, some of the same sectors remain protected or have repeated episodes of protection. Furthermore, the circumstances in which countries raise their barriers to trade resurface time and again.

The third theme is that the reduction of traditional border barriers and integration of economic activity, even though arguably incomplete, has opened up new areas of policy conflict that are expected to grow in importance. Bilateral frictions between trading partners have moved beyond tariffs and quotas to the international externalities associated with domestic policies—ie, domestic tax and subsidy regimes, health and safety standards for products, as well as labor and environmental regulations. In order to survey the empirical landscape of these "behind-the-border" policies that potentially restrict trade, we use case studies to highlight important themes. Partly because of the lack of internationally comparable data on domestic policies, rigorous empirical work in this area is very thin. While this area is of increasing importance, the literature is unsettled as to the positive and normative understanding of the extent to which regulatory policies unduly inhibit trade and what, if anything, trade agreements could or should do about it.

As we catalogue and describe what is known about trade policy in 2013 and 2014—the most recent years for which we observe near-complete data reporting—one objective is to correct the widely-held misunderstanding that trade is already free from policy impediments. Among academic economists, there remains considerable disagreement about the quantitative importance of different types of trade barriers. While firm-level studies infer that sizeable additional costs associated with *international* commerce relative to domestic commerce must exist,[d] an open question is whether these important trade costs are due to trade policy or to something else. Anderson and van Wincoop (2004), through a combination of direct observation and inferences from a gravity trade model, quantify the representative border-related trade costs for an industrialized country at 44% ad valorem and the representative transportation costs at 21%. In contrast, Hummels (2007, p. 136) suggests that the importance of policy barriers has been completely eclipsed by real transportation costs: "For the median individual shipment in US imports in 2004, exporters paid $9 in transportation costs for every $1 they paid in tariff duties."

[d] For example, Bernard et al. (2007) and Eaton et al. (2011) have documented that only a small fraction of a country's manufacturing firms tend to engage internationally, with 18% of US firms exporting in 2002 and 15% of French firms exporting in 1986, respectively.

Although we are not be able to quantify the relative contributions of different forms of trade costs, we do hope to illustrate why many summary measures of trade policy are not appropriate for understanding the full economic importance of policy barriers to trade. Three simple examples help to illustrate the point. First, the real world consists of significant nontariff policy instruments; these include a number of border policies that, while *technically* applied as a tariff, are typically not captured in the reported data of "headline" measures of tariffs. Second, trade policy is commonly applied in a nonuniform manner across trading partners. Third, applied trade policy can vary considerably over time, especially in response to the business cycle, movements in the real exchange rate, or due to trade volume shocks; nevertheless, these policy changes are not made through applied ad valorem import tariffs, but via some other, less transparent, policy tool.

In the coming sections, we document that policy barriers to trade still exist; they vary considerably across products, trading partners and time; they take many forms; and they arise under legal frameworks (established by international trade agreements) that can result in subtle differences in both the frequency of their use and of their trade-reducing potential.

Section 2 begins by analyzing the focal policy of the trading system—the import tariff. This section examines different dimensions of tariff data for our sample of 31 economies to provide an initial response to each of our chapter's first four questions. We introduce the most-favored-nation (MFN) ad valorem import tariff—ie, the "headline" border policy instrument that countries impose under the WTO. While applied tariff levels are relatively low in historical terms, significant cross-country heterogeneity remains; furthermore, the negative correlation between applied tariffs and income per capita is even more pronounced once we consider the countries' "legal" commitments that are the upper limits for their tariffs. Next, we characterize cross-sectional variation in applied tariffs across sectors and inter-temporal variation across countries over 1993–2013. We then introduce which countries and sectors apply *specific*—or per unit—duties, and we describe what makes them distinct from ad valorem tariffs. Finally, we characterize the lower-than-MFN tariffs that countries apply under a variety of preferential trade arrangements. Because these allow countries to take on additional liberalization, we illustrate the extent to which countries apply tariffs so as to discriminate among trading partners.

In Section 3 we introduce the other major (nontariff) border barriers, and we use them to further inform our chapter's main themes.[e] Contemporary use of temporary

[e] One set of border policies that we do not directly address are export policies, and in particular export taxes or export quotas. Some discussion of export subsidies will arise in Section 5 by implication of our discussion of domestic subsidies, especially where they impact two exporting countries competing in a third market. On subsidies more generally, see Lee (2016). Export restrictions are of particular historical importance in global energy (oil, natural gas) and commodity food markets. For a discussion, see Ederington and Ruta (2016).

trade barrier policies—such as antidumping, safeguards, and countervailing duties—by emerging economies in particular has been increasing, and these import restrictions are characterized by both heterogeneity across economic sectors and discriminatory use against particular exporting country trading partners. We then turn to a description of other nontariff policies, such as quotas, price undertakings, voluntary export restraints, and other administrative hurdles (customs valuation and import licensing) that governments can manipulate to restrict trade at the border.

Once we have described the contemporary landscape of border policies, Section 4 examines the longer-term evolution of import tariffs and other border barriers in order to put the current system into better historical context. We start with information on the evolution of tariffs from the late 1940s through the late 1990s. Moreover, we provide a brief history of the ebb and flow in the use of a number of special import restrictions over this longer time horizon. This includes import restrictions to safeguard the balance of payments; the discriminatory treatment of Japan despite its GATT accession in 1955; the multifiber arrangement (MFA) and other voluntary export restraints; the sectoral carve out for agriculture; and special and differential treatment for developing countries. This section not only clarifies how the current landscape of trade policy arose, but it also allows us to emphasize our second theme of history frequently repeating itself, albeit through different policy tools, by different countries, or against different trading partners. Finally, this section helps provide a partial answer to our fifth question, "how liberalized is world trade?" In comparing the border barriers of today with the border barriers of the past, the current system is one that appears relatively open.

Section 5 then returns to the contemporary landscape by introducing a set of "behind-the-border" policies that have the ability to substantially impact international commerce. These include domestic subsidies and taxes, as well as standards and regulations. A comprehensive characterization of such data is notoriously difficult and fraught with measurement concerns; thus we survey case studies from recent policy conflicts in order to highlight important areas. Our survey covers roughly 10% of the population of formal trade disputes arising during the WTO's first 20 years. We conclude that the next major frontier for the world trading system involves how it confronts the trilemma of respecting local tastes and objectives in domestic policy, internalizing cross-border policy spillovers that operate through trade flows, and facilitating greater trade integration to sustainably maximize the value of the world's productive resources.

Finally, Section 6 concludes with a brief discussion of how our results may also inform other areas of research in international economics beyond studies of commercial policy.

2. IMPORT TARIFFS

The natural place to begin an empirical analysis of contemporary trade policy is with the import tariff, the most prevalently applied trade policy which is used under both

multilateral trade agreements such as the GATT/WTO as well as under preferential trading arrangements (PTAs). This section uses tariffs to provide a first round of answers to each of our five major questions: Do some countries have lower tariffs than others? Within countries, which sectors receive the most tariff protection? How do tariffs change over time? Do countries set tariffs so as to discriminate among their trading partners? Finally, how liberalized are tariffs?

Much of our formal analysis in this section relies on cross-country and inter-temporal data comparisons where, for reasons of data quality, we do not attempt to be comprehensive. Instead, we focus on a sample of 31 economies listed in Table 1.[f] These major economies were not chosen randomly—they include the Group of 20 (G20) economies plus an additional set of developing countries each with 2013 populations of over 40 million. Collectively in 2013, these 31 economies represented 83% of the world's population, 91% of GDP, 80% of imports, and 79% of exports. Fig. 1 illustrates their geographic diversity.[g]

We begin in Section 2.1 by introducing and describing *ad valorem* import tariffs under the WTO. In the contemporary data, we find the tariffs that countries apply are relatively low on average. However, for many countries, these applied tariffs are substantially lower than the maximum tariffs allowed under the WTO, implying that trade is much less liberalized when viewed through the lens of the tariffs that countries are legally permitted to apply. There are also surprisingly large differences across countries in the average level of tariffs: high-income countries have more liberal trade regimes than middle income countries which, in turn, have more liberal regimes than low income countries. Across the board, countries tend to charge higher tariffs in the agricultural sector, in manufacturing industries such as textiles, apparel, and footwear, and in final goods relative to intermediate inputs. Finally, over the most recent 20 year period (1993–2013), we find a general downward trend in tariffs for many, but not all, countries. Furthermore, while applied tariffs for high-income countries exhibit little variation at the annual frequency over the period, there is slightly more variation for lower-income countries.

[f] Here and throughout we refer to economies and countries interchangeably even though we will generally rely on information about the European Union collectively as opposed to its member states individually. Since these countries have a common trade policy set by the European Commission, we treat them as one economy. The 28 member countries of the EU as of 2013 included Austria, Belgium, Bulgaria, Croatia, Republic of Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United kingdom.

[g] Sub-Saharan Africa is under-represented in the sample of 31 economies utilized in the empirical analysis. Nevertheless, the tariff characteristics for African countries more generally, and that we detail later, are well captured by the countries included in the analysis, and especially Democratic Republic of Congo, Ethiopia (a WTO nonmember), Kenya, Nigeria, and Tanzania. Bown (2015) provides additional descriptive analysis of the tariffs for developing countries, including African countries.

Table 1 MFN ad valorem import tariffs for selected economies, 2013

Country/ territory	MFN applied rate, simple average	WTO binding rate, simple average	Binding coverage	Coverage of applied duties >15%	Coverage of binding rates >15%	Maximum MFN applied rate
	(1)	(2)	(3)	(4)	(5)	(6)
G20[a] High income						
Australia	2.7	10.0	97.0	0.1	13.4	140.0
Canada	4.2	6.8	99.7	6.8	7.3	484.0
European Union	5.5	5.2	100.0	5.1	4.8	511.0
Japan	4.9	4.7	99.6	3.7	3.7	736.0
Korea	13.3	16.6	94.6	10.4	20.5	887.0
Saudi Arabia	4.8	11.2	100.0	0.2	1.1	298.0
United States	3.4	3.5	100.0	2.7	2.7	350.0
G20[a] Emerging						
Argentina	13.4	31.9	100.0	36.0	97.8	35.0
Brazil	13.5	31.4	100.0	36.2	96.4	55.0
China	9.9	10.0	100.0	15.6	16.4	65.0
India	13.5	48.6	74.4	19.0	71.5	150.0
Indonesia	6.9	37.1	96.6	1.7	90.7	150.0
Mexico	7.9	36.2	100.0	15.7	98.7	210.0
Russia	9.7	7.7	100.0	10.1	2.1	441.0
South Africa	7.6	19.0	96.1	20.7	39.6	>1000
Turkey	10.8	28.6	50.3	13.6	28.9	225.0
Developing, other[b]						
Bangladesh	13.9	169.2	15.5	41.2	15.1	25.0
Burma	5.6	84.1	17.8	5.0	14.6	40.0
Colombia	8.8	42.1	100.0	2.1	98.0	98.0
DR of the Congo (2010)	11.0	96.2	100.0	28.5	98.9	20.0
Egypt (2012)	16.8	36.9	99.3	19.2	70.7	>1000
Ethiopia[c] (2012)	17.3	–[d]	–[d]	50.8	–[d]	35.0
Iran[c] (2011)	26.6	–[d]	–[d]	45.7	–[d]	400.0
Kenya	12.7	95.1	14.8	41.4	14.8	100.0
Nigeria	11.7	118.3	19.1	39.0	19.1	35.0
Pakistan	13.5	60.0	98.7	36.0	94.9	100.0
Philippines	6.3	25.7	67.0	3.2	56.0	65.0
Tanzania	12.8	120.0	13.3	41.8	13.3	100.0

Continued

Table 1 MFN ad valorem import tariffs for selected economies, 2013—cont'd

Country/ territory	MFN applied rate, simple average	WTO binding rate, simple average	Binding coverage	Coverage of applied duties >15%	Coverage of binding rates >15%	Maximum MFN applied rate
	(1)	(2)	(3)	(4)	(5)	(6)
Thailand	11.4	27.8	75.0	25.5	66.0	226.0
Ukraine	4.5	5.8	100.0	2.7	3.8	59.0
Vietnam	9.5	11.5	100.0	24.8	27.7	135.0

Notes: Tariff data taken from WTO, 2014. World Tariff Profiles 2014. WTO, UNCTAD, and ITC, Geneva. Columns (1), (2), and (6) are ad valorem rates, and columns (3), (4), and (5) are shares of import products. Parentheses indicate data availability for year other than 2013.
[a]G20 = Group of 20.
[b]Selected other developing countries chosen as those with 2013 populations greater than 40 million.
[c]Indicates WTO nonmember.
[d]Indicates legal bindings not relevant for WTO nonmembers.

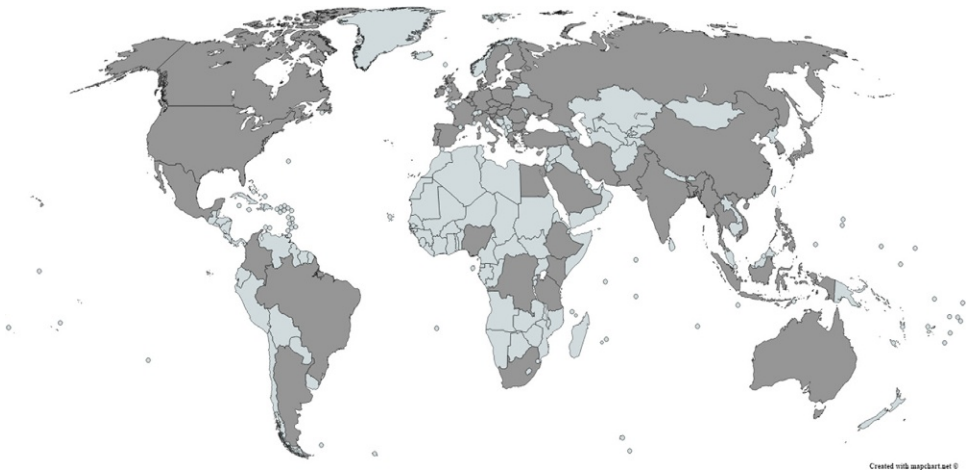

Fig. 1 Geographic coverage of the 31 economies in the empirical exercise.
Constructed by the authors. Dark gray countries are included in the empirical exercise.

In Section 2.2, we document the frequency with which countries apply specific duties, or per unit import tariffs, under the WTO. These sorts of tariffs arise disproportionately in a number of high and middle-income economies and are mostly limited to sectors such as agriculture, textiles and apparel, and footwear. We then motivate why it is important to consider specific duties distinctly from ad valorem tariffs. The ad valorem equivalent of a specific duty can vary—either over time or with respect to its discriminatory effect across trading partners—in ways that are distinctive from tariffs applied in ad valorem form.

Section 2.3 then examines the characteristics of the bilateral tariffs that countries charge under various preferential trading arrangements; this allows us to assess the extent to which countries apply tariffs which discriminate among trading partners. We find that countries vary considerably with respect to how many products are eligible for tariff preferences, how many preferences are offered, and how large tariff preference margins are. High-income countries have relatively few products on which they could offer preferential tariffs because so many of their tariffs are already set at zero. While high-income countries are rather generous in offering favorable treatment when possible, the resulting tariff preference margins that they can offer are nonetheless expectedly low. Lower income countries have more potential products over which they could offer preferences. However, because they offer preferences for fewer products and the preference margins are relatively high, trade diversion (Viner, 1950) associated with preferential tariffs is perhaps a more significant concern for lower income countries.

2.1 MFN (Most-Favored-Nation) Ad Valorem Import Tariffs Under the WTO

The WTO had 161 members as of 2015. This means that the WTO rules governing import restrictions apply to almost all countries that are engaged in international trade; indeed, 29 out of the 31 economies of Table 1 are WTO members. The vast majority of tariffs are applied in the *ad valorem* form that we describe in this section; the alternative is for the rate to be defined as a specific, or per unit, duty. As specific duties capture a few additional subtle distinctions, we introduce them separately below. Finally, and as we discover below in our analysis of tariffs under PTAs in Section 2.3, the applied ad valorem import tariff under the WTO is the border tax applied to an overwhelming share of traded products in the global system.

2.1.1 MFN Applied Rates, Tariff Bindings/Caps, and Binding Commitments

Are today's tariffs liberalized under the WTO? Furthermore, do some countries seem to have lower tariffs than others under the WTO? We examine these questions not only for applied tariffs, but also by describing the maximum tariffs that countries can *legally* apply under WTO rules. We begin by briefly introducing the basic WTO legal requirements associated with membership and defining some terminology.

Membership in the WTO requires that countries take on three main commitments with respect to their tariffs. First is the commitment that they apply the tariff at the same rate against imports from all other WTO members through the most-favored-nation (MFN) principle of nondiscrimination. Second, a WTO member chooses the set of products—up to 100% of products defined under the Harmonized System—over which it agrees to take on some legally binding commitment—a cap above which it promises not to raise its applied tariff. Third, for each of those products with some legally binding commitment, the member chooses an exact value for this upper limit. This upper limit is referred to as the "tariff binding" or "tariff cap." A country's MFN applied rate must

therefore be less than or equal to the tariff binding in order to be legal under the WTO.[h] Finally, the difference between the tariff binding rate and the MFN applied rate is frequently referred to as the tariff binding "overhang" or alternatively, the "water" in the tariff binding.

The first column of Table 1 presents the simple average of the MFN applied ad valorem import tariff rate for our sample of major economies in 2013, only two of which were not members of the WTO.[i] The United States, for example, applied an MFN tariff to imports from other WTO members at a simple average rate across the roughly 5200 6-digit Harmonized System (HS06) products of 3.4% in 2013. Among the high-income G20 members, Australia had the lowest average MFN applied tariff (2.7%) and Korea had the highest (13.3%). The emerging economy members of the G20 tend to have slightly higher MFN applied import tariffs, ranging from Indonesia (6.9%) to India (13.5%). The other developing countries in the sample that were WTO members by 2013 had applied MFN tariffs that were even slightly higher than the typical G20 rates, ranging from an average of 5.6% (Burma) to 16.8% (Egypt). Finally, the WTO nonmember countries, such as Ethiopia and Iran, had average MFN applied rates that were substantially higher.[j]

[h] To summarize, the MFN commitment is a principle to which all WTO members must abide, subject to a number of well-defined exceptions that we describe later. On the other hand, WTO members establish their second (set of products with any cap) and third (level of the binding tariff) commitments individually. These second and third commitments have resulted from either decades of interaction with other WTO members under GATT negotiating rounds or the negotiated process of accession.

[i] More details on these data are described in Data Appendix. First, the applied tariffs are the tariffs that governments set, and the measure derives from policy data that either the government reports itself (to the WTO) or which are collected via official government publications by other international organizations; typically these are reported on an annual basis. Put differently, these measures of tariffs are *not* imputed from data on customs revenue collections. Furthermore, these applied tariff measures do *not* include other border charges or taxes, including safeguards tariffs and antidumping duties that we describe in Section 3.1. Second, throughout this analysis we only utilize simple average tariffs; the alternative of constructing trade-weighted average tariffs can lead to the well-known problem of downward bias due to products with high tariffs receiving low weights (because of small import volumes). The intuition is provided by the limiting example of a prohibitive tariff level which receives zero weight in the averaging calculation. Third, the calculations in Table 1 derive from data that does include consideration of ad valorem equivalent estimates for products over which the import tariff that the country applies is a specific duty. We describe data on the prevalence of import tariffs applied as specific duties in Section 2.2. In other areas of this chapter—such as when we wish to focus on changes in tariffs arising from *policy decisions*—we deliberately drop from consideration the products for which tariffs are applied as specific duties.

[j] We note that an MFN tariff is somewhat of a legally meaningless concept for countries such as Ethiopia and Iran as they are not WTO members and are thus not bound by the multilateral agreement. This similarly holds for the "MFN" tariffs (reported later) applied prior to GATT/WTO membership for countries that ultimately become members. An open research question is the extent to which countries impose tariffs on an MFN basis when they are not legally bound to do so. Furthermore, our use of the word "legal" to describe WTO tariff commitments refers to treaty obligations that countries voluntarily assume, as enforcement of WTO "law" is by the mutual agreement of all parties, as is described in greater detail elsewhere in this volume (Mavroidis, 2016).

Overall, applied ad valorem import tariffs exhibit substantial heterogeneity across countries. High-income economies apply much lower tariffs than middle income countries. Furthermore, poor countries apply tariffs that are even higher than the middle income countries.

The MFN tariff rates that countries apply are not necessarily the same as the tariffs that countries have legally committed to under the WTO as they can be lower. The third column in Table 1 lists the share of imported products over which the country has agreed to take on a tariff commitment. The United States, the EU, Saudi Arabia, Argentina, Brazil, China, Mexico, Russia, Democratic Republic of Congo, and Vietnam have agreed to bind tariffs for 100% of their imported products. For countries that have not agreed to bind all of their products at some upper limit, the remaining products have tariff upper limits that are "unbound," ie, potentially infinite. For example, India and Turkey have 25% and 50% of their imported products with MFN tariffs that are unbound, respectively.[k] Finally, the lower third of the table reveals that poorer countries like Bangladesh, Burma, Kenya, Nigeria and Tanzania have more than 80% of their imported products with tariffs that remain unbound.

The second column in Table 1 reveals that even for the economies that have agreed to bind the vast majority of their tariffs under the WTO, there is wide variation in the average upper limit that the country has agreed to take on. For example, while the first column identifies 14 different economies that *applied* their MFN tariffs at rates that average less than 10%, only Canada, China, the EU, Japan, Russia, Ukraine, and the United States have undertaken WTO legal commitments to *keep* those tariffs at an average of 10% or less. And while average applied and WTO binding rates are almost identical for China, the EU, Japan, Russia, and the United States, most emerging economies and developing countries have average WTO binding rates that are significantly higher than their average applied MFN rates.[l] Within the G20 emerging economies, the existence of this binding overhang is particularly prominent, as average bindings may be 2–5 times higher than applied rates. For other developing countries listed in Table 1, such as Bangladesh and Nigeria, the average binding commitment is more than 100 percentage points higher than the MFN applied rate in 2013.

[k] On the other hand, and as we introduce in Section 2.3, Turkey has a customs union with the European Union and thus its applied MFN tariffs are tied to the EU's applied tariffs. Thus, the fact that the EU has bound 100% of its tariffs may serve as a de facto anchor (in lieu of a WTO binding legal commitment) for Turkey as well.

[l] Average applied rates are higher than average binding rates for an economy like the European Union in Table 1 because of a combination of the procedure of averaging from product-level data and of the computation of ad valorem equivalents for products' rates applied as specific duties (in a given year, reflecting current prices) vs binding rates. For Russia, an additional contributor to the fact that its applied MFN rates were higher than its binding rates is likely due to its relatively recent WTO accession and it has not yet fully phased in all of its associated applied MFN tariff reductions.

Average import tariff bindings exhibit even more variation across countries than applied tariffs. High-income economies have comprehensive tariff binding coverage for their products, low legally binding tariff commitments, low applied rates, and little tariff overhang. Poorer countries have many more products with import tariffs that are unbound, and their binding tariff commitments are significantly higher than their applied rates. For middle income and poor countries under the WTO, although many are currently applying a fairly liberal tariff regime, they are not legally committed to maintaining this liberal regime under the WTO.

For countries with low tariffs on average, are tariffs set at universally low levels across products? The last three columns in Table 1 provide a summary answer to this question by reporting the share of products covered by tariffs of 15% or more, or "tariff peaks." For example, even though the United States has an applied MFN tariff that averages 3.4%, 2.7% of its imported products in 2013 faced MFN applied tariffs of 15% or more. The peak US tariff was 350%. Canada had nearly 7% of its imported products with tariffs of over 15%, with a peak rate of 484%. For emerging and developing countries, even larger shares of imported products are subject to these tariff peaks. Most every country has some sensitive products over which it retains very high tariffs.

We conclude this section with a brief discussion of our first broad finding, which is that there can be surprisingly large differences across countries in the average level of tariffs. Overall, both applied tariffs and tariff binding levels are negatively correlated with GDP per capita.

A first important research question is thus why tariffs are so much higher for lower income countries in particular. One long-standing explanation for why developing countries set higher tariffs is that collecting government revenue at the border may be more efficient administratively than other forms of taxation. For example, Keen (2008) reports import tariffs account for 20% or more of tax revenues in many developing countries, and Baunsgaard and Keen (2010) find that low-income countries undergoing trade reforms have been only partly successful (20–25%) at recovering lost tariff revenue by switching to other sources of taxation.[m] Country-level differences are likely explained not only by fiscal concerns, but also by the transparency of the country's government, its form of governance, and its responsiveness to public welfare (Gawande et al., 2006, 2009; Mitra et al., 2002).

[m] As a point of comparison, consider the importance of customs revenue in total fiscal revenue in the United States before the ratification of the 16th Amendment in 1913 which made constitutional the US federal income tax. Data from International Historical Statistics (Palgrave Macmillan, 2013) reports that customs revenue made up an average of 47% of total federal tax revenue collections during the decade of 1900–09. On the other hand, after both the income tax and the beginnings of the GATT tariff liberalization, customs revenue made up an average of less than 1% of US total federal tax revenue collections during the decade of 1950–59.

A second important research question involves the potential implications of lower-income country decisions to retain sizeable differences between binding and applied tariff rates. A nascent research literature suggests that such differences may affect a country's ability to reduce the sort of trade policy uncertainty that leads to inefficient levels of firm investment, output, and exporting (Handley and Limão, 2014, 2015; Handley, 2014; Crowley et al., 2016).

2.1.2 MFN Applied Tariffs Across Sectors

The second main question of our chapter asks if tariffs are set at different rates across sectors within countries. Here, we begin by inquiring whether there are some sectors that uniformly receive more import protection than others, and if there are patterns to this variation across countries.

Fig. 2 provides detail on the average applied MFN rates and legal bindings by industry for three groups of policy-imposing countries—the G20 high-income, the G20

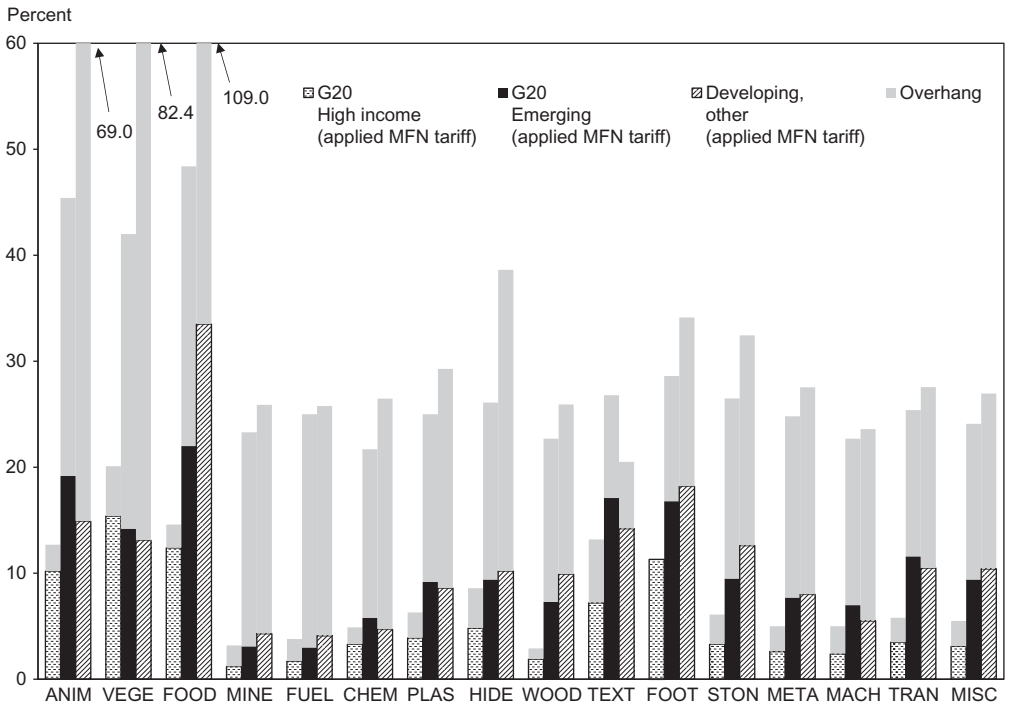

Fig. 2 Average applied MFN tariffs in 2013 and tariff bindings, by industry and country group.
Constructed by the authors from tariff data at the HS-06 level from the WTO and UNCTAD/TRAINS. Tariff "overhang" (or water) defined as the difference between the country's tariff binding legal commitment and its applied MFN rate. Country groupings based on Table 1.

emerging, and the other developing countries as classified in Table 1. We break up the universe of imported goods in the Harmonized System into sixteen different sectors.[n]

The figure illustrates a number of relatively clear patterns to the cross-sectoral variation in applied tariff levels. First, high-income countries have lower average applied MFN tariffs than emerging economies and other developing countries almost universally across sectors; sector-by-sector, higher-income economies have lower tariffs than emerging economies which, in turn, have lower tariffs than poorer developing countries. Second, across country groupings, the average applied MFN tariffs are also typically higher in sectors such as agriculture (animals, vegetables, and foodstuffs), textiles and apparel, and footwear. Third, while the high-income economies have relatively little binding overhang in any sector, there is evidence of significant overhang for emerging and developing countries across all sectors. However, the greatest amount of overhang is in agriculture, suggesting that this is the sector in which emerging and developing economies have the greatest discretion to raise applied tariffs from 2013 levels while maintaining their WTO commitments.[o] For high-income economies in agriculture, we return to this issue in our discussion of specific duties and quantitative restrictions below.

Fig. 3 presents an alternative approach to the tariff data by examining the share of HS06 imported products within a sector for which the MFN applied rate is defined as being a tariff peak, or a tariff applied at or above the threshold level of 15%. For high-income economies, nearly 30% of products in the foodstuffs sector had an applied MFN tariff in 2013 of 15% or more. Similar peak tariffs can be found for high-income economies in 18% of products in the animal sector, 15% in footwear, 13% in vegetables, and 6% in textiles and apparel. The distribution of peak tariffs across sectors is quite similar for emerging and developing countries; it is simply that in emerging and developing countries the share of products within each sector that has such high tariffs is significantly larger. Nearly 70% of footwear products in developing countries had applied MFN tariffs at rates that are higher than 15% in 2013.

Recent empirical research has sought to explain aspects of the considerable cross-sectional variation in MFN applied tariffs and WTO tariff bindings. One important example is Broda et al. (2008), which exploits the variation in applied rates to assess implications of the terms-of-trade theory across a number of different empirical contexts. They examine tariff variation for a number of WTO *nonmember* countries and conclude that market power helps to explain applied tariffs for countries unconstrained by trade

[n] Industry classification is given in Table A.1.

[o] Some countries have used this flexibility to make relatively high frequency—eg, weekly and monthly—changes within years (and thus potentially not captured in the annual data) to applied MFN tariffs on agricultural products, perhaps in light of both political economy concerns and the uncertainty of yields due to weather-related shocks and growing seasons. Recent WTO disputes challenging such policies imposed by Chile and Peru are described in Bagwell and Sykes (2005a) and Saggi and Mark (2016), respectively. On agricultural tariffs more generally, see Hoekman et al. (2002, 2004).

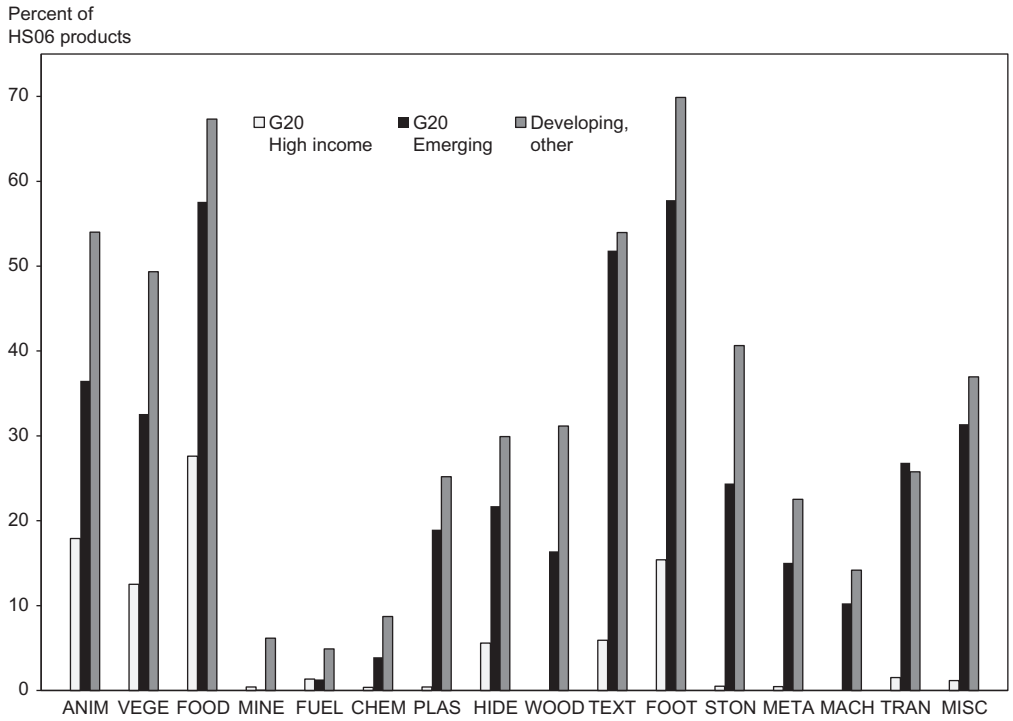

Fig. 3 Applied MFN tariff peaks in 2013, by industry and country group.
Constructed by the authors from tariff data at the HS-06 level from the WTO and UNCTAD/TRAINS. A tariff peak is defined as an HS-06 product with an applied MFN tariff greater than 15%. Country groupings based on Table 1.

agreements.[p] An alternative theoretical explanation for cross-sectoral variation in applied tariffs is political economy, for which the Grossman and Helpman (1994) structural model of lobbying and endogenous import protection provides a rich set of empirically testable predictions. However, much of the literature seeking to empirically test the Grossman–Helpman model has focused on the sector-level variation in *nontariff* policies—of the sort that we introduce and describe in Section 3.[q]

[p] Other research exploring the empirical relevance of the terms-of-trade theory for negotiated trade agreements using applied and bound tariffs includes Bagwell and Staiger (2011), Ludema and Mayda (2013), Nicita et al. (2014), and Beshkar et al. (2015). Bown (2015) provides both a survey of these papers and an empirical assessment of some of their implications for the applied and bound tariffs of developing countries.

[q] This literature is surveyed in McLaren (2016). Exceptions for research providing estimates of the Grossman–Helpman model on *tariff* policies include Mitra et al. (2002) for Turkey, Bown and Tovar (2011) for India, and Gawande et al. (2009) for a cross section of countries.

2.1.3 MFN Applied Tariffs Within Sectors by End-Use

Within sectors, do countries also apply different tariffs to products depending on what "consumers" use them for? Our next diagnostic maps HS06 products into two categories from the UN Broad Economic Categories (BEC): final goods (for consumption) and intermediate inputs.[r]

Fig. 4 provides some evidence of "tariff escalation"—ie, countries tend to apply higher import tariffs on final goods than they apply on intermediate inputs. The purpose may be to increase domestic value-added into production (and exports) or to affect inclusion in international supply chains. Overall, MFN applied tariffs on final goods average 70–75% higher for the G20 high income and emerging economies (and more than 90% higher for other developing countries) than the average MFN tariffs that those same countries apply to products classified as intermediate inputs. The evidence of tariff escalation is fairly strong across almost all sectors and country groups as average applied MFN tariffs on final goods are significantly higher than those on intermediate inputs.

Finally, we note the existence of one additional source of tariff discrimination within certain products— ie, intermediate inputs—that is contingent on the final geographic consumption location (domestic or foreign) of the ultimate final output. Consider the tariff rate on intermediate inputs in a country which uses a "dual import" or "duty drawback" tariff regime. Such regimes apply different MFN tariff rates for the same imported intermediate input (and from the same foreign source) depending on whether the ultimate *consumer* of the final processed good embodying that input is domestic or foreign. Under such regimes, imported inputs into a final product designated for export are allowed to enter the economy duty-free (or with the applied MFN tariff being refunded), whereas the same inputs face the normal MFN applied tariff if the input is used to produce a good that could be consumed domestically. With China arising as a prominent example of an export-led major economy that utilizes such a special import tariff system, researchers are increasingly studying the implications of this form of applied tariff discrimination.[s]

2.1.4 Changes to MFN Applied Tariffs Over Recent History

Our third major question involves whether governments make significant changes to their applied tariffs over time. Here, we examine the extent to which tariffs have changed

[r] For ease of exposition, we strip out BEC categories of "mixed use."

[s] A constraining feature of such regimes is that they must be designed so as to satisfy the WTO rules that limit export subsidies; for a discussion, see ITC (2009). Sometimes these systems are administered via a geographic area being designated as an export processing zone; in other instances, the regimes may not be constrained by geography but only by the willingness and ability of firms to comply with national legal requirements such as customs declarations. See Madani (1999) for an overview of export processing zones. Recent research analyzes the productivity implications of these dual tariff structures (Yu, 2015) or the implications for domestic factor demands (Brandt and Morrow, 2015).

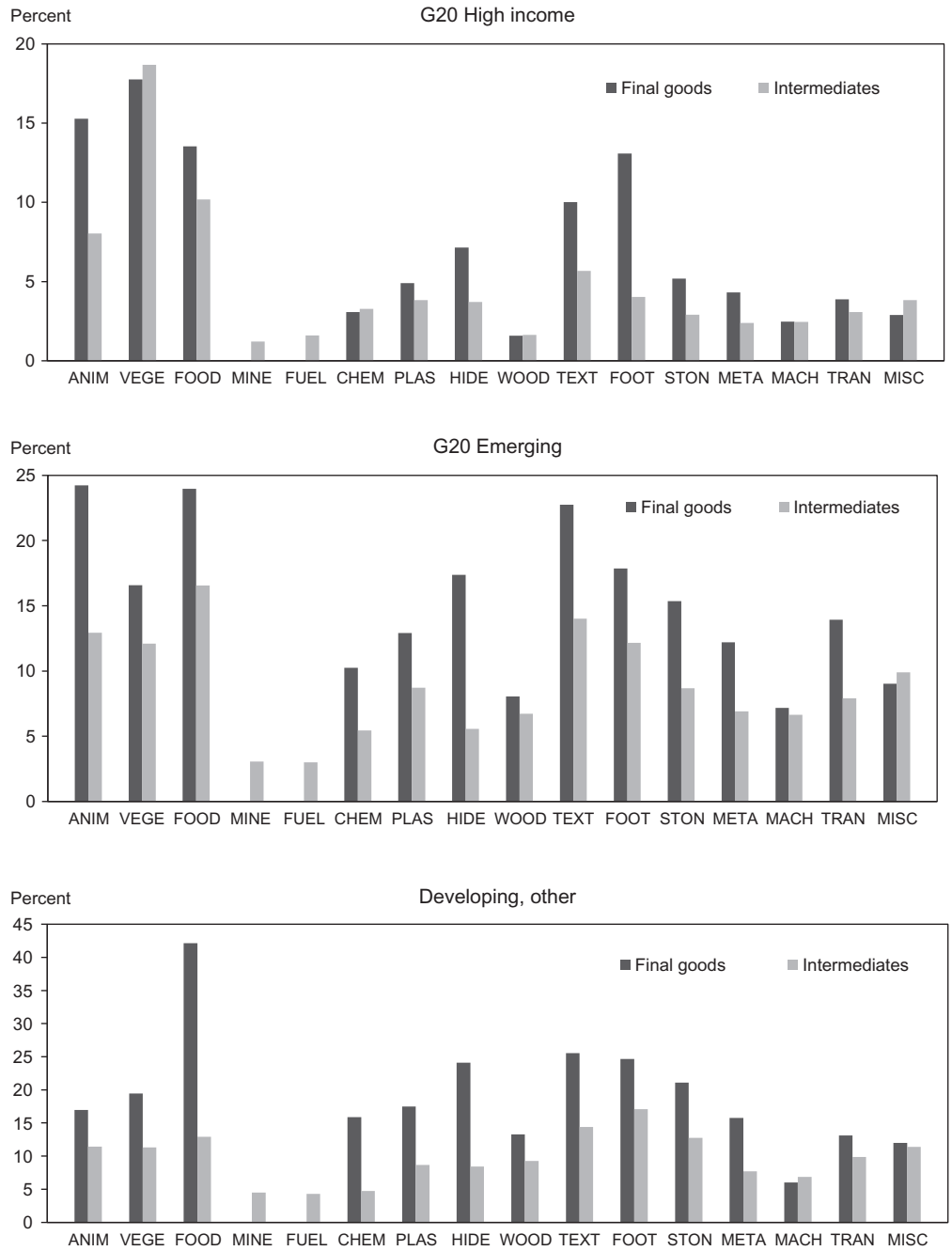

Fig. 4 Tariff escalation: Average applied MFN tariffs in 2013, by end use categories, industry and country group.

Constructed by the authors from tariff data at the HS-06 level from the WTO and UNCTAD/TRAINS. End use categories for each HS06 product taken from the BEC, with mixed use goods dropped. Country groupings based on Table 1.

over the most recent 20 year period, beginning with the ending of the GATT period through 2013.[t] We first examine changes arising as long differences before turning to higher frequency data.

Table 2 presents average applied MFN tariffs for our sample of countries for three key years chosen to reveal the impacts of important institutional milestones arising across three decades: 1993, 2003, and 2013.[u] The table also provides information on when (if ever) the country became a member of the GATT, as well as when (if ever) the country became a member of the WTO.

For countries that were members of the GATT, the 1993 data in Table 2 reflects their applied MFN GATT tariffs *before* they implemented any changes resulting from the Uruguay Round of negotiations that ushered in the WTO. By 2003, the countries that joined the WTO at its 1995 inception had phased in most of their Uruguay Round tariff liberalization commitments; thus a comparison of 1993 and 2003 for such countries provides a first-order assessment of the impact of the Uruguay Round on average applied MFN tariffs. For countries that acceded to the WTO somewhat later, comparisons of the tariff data can provide information on pre-WTO and post-WTO accession applied MFN tariffs.

Table 2 evidence on changes to applied MFN tariffs for the G20 high-income economies over this extended period is mixed. Long-standing GATT/WTO members such as the European Union, Japan and the United States already had relatively low MFN applied rates at the end of the GATT period in 1993 at 7.0%, 4.4%, and 5.6%, respectively. These economies cut their average applied tariffs by another 1–3 percentage points as a result of the Uruguay Round; and, given their low initial applied levels, low tariff bindings, and resulting lack of overhang (see again Table 1), applied MFN tariffs for these economies were virtually unchanged between 2003 and 2013. For Australia and Canada, average applied MFN tariff cuts over the 20 year period have been larger. Korea's average

[t] In Section 4 we address the question for tariffs over a longer period dating back to 1947 for a smaller selection of countries.

[u] We examine this particular period for two reasons. First, we are interested in the highest quality (across country) data on MFN applied tariffs for a consistent classification scheme, and the Harmonized System (HS) went into effect in 1988. Thus any attempts to assess changes in tariffs for a period before and after 1988 will have to confront serious concordance issues that will differ country-by-country, but which will make averaging or examining product level changes nontrivial. Second, despite the HS beginning in 1988, data for many countries in our sample does not become routinely available until the early 1990s. Nevertheless, picking 1993 as a common starting point does miss out on some countries' substantial tariff liberalization periods that may have already begun in the early 1990s (India), 1980s (Argentina, Brazil, Colombia, Mexico), or even earlier. Furthermore, applied MFN tariff data is not available for all countries in all years in the sample. Finally, the data for 2013 in Table 2 may differ from Table 1 as we are now limiting our consideration of products to which the tariff is applied on an ad valorem basis, so as to focus on policy changes and not changes in ad valorem equivalent rates that may arise for specific duties due to changes in underlying prices.

Table 2 Average applied MFN ad valorem import tariffs for selected economies: 1993, 2003, and 2013

	GATT membership year	WTO membership year	Simple average applied MFN tariff for		
			1993	2003	2013
G20 High income					
Australia	1948	1995	8.8	4.2	2.7
Canada	1948	1995	9.0	5.1	3.7
European Union	–[a]	1995	7.0	4.4	4.4
Japan	1955	1995	4.4	3.2	3.0
Korea	1967	1995	11.7[b]	11.6	12.2
Saudi Arabia	NM	2005	12.1[b]	6.0	4.6
United States	1948	1995	5.6	3.7	3.5
G20 Emerging					
Argentina	1967	1995	11.2	14.2	13.4
Brazil	1948	1995	14.0	13.5	13.5
China	NM	2001	39.1	11.4	9.6[b]
India	1948	1995	56.3[b]	26.5	13.3
Indonesia	1950	1995	17.9	6.9	6.7
Mexico	1986	1995	13.7[b]	18.0	7.7[b]
Russia	NM	2012	7.8	10.7[b]	8.9
South Africa	1948	1995	16.0	5.6	7.4
Turkey	1951	1995	9.3	10.0	10.8
Developing, other					
Bangladesh	1972	1995	82.8[b]	19.5	14.0
Burma	1948	1995	–	5.5	5.6[b]
Colombia	1981	1995	12.3[b]	12.3	6.8
DR of the Congo	NM	1997	–	12.0	11.0[b]
Egypt	1970	1995	34.6[b]	26.9	16.8[b]
Ethiopia	NM	NM	28.9[b]	18.8[b]	17.3[b]
Iran	NM	NM	–	27.3	26.6[b]
Kenya	1964	1995	35.2[b]	15.2[b]	12.8
Nigeria	1960	1995	34.4[b]	28.6	11.7
Pakistan	1948	1995	50.8[b]	17.1	13.5
Philippines	1979	1995	22.9	4.7	6.3
Tanzania	1961	1995	20.3	13.6	12.8
Thailand	1982	1995	45.7	15.4	10.4
Ukraine	NM	2008	7.0[b]	7.0[b]	4.5
Vietnam	NM	2007	14.1[b]	16.8	9.4

Constructed by the authors with applied ad valorem duties data at the HS06 level taken from WTO and UNCTAD/TRAINS. For the purposes of this table, ad valorem equivalent rates of tariffs applied as specific duties are omitted from the calculations. G20 = Group of 20. NM indicates GATT or WTO nonmember.

[a]Different European Union member states became GATT Contracting Parties in different years.

[b]Data for that year not available and so chosen as the closest available year.

applied MFN import tariff is actually higher in 2013 than it was in 1993. Finally, Saudi Arabia's tariff by 2013 is roughly one third of its 1993 level, which largely reflects the commitments it undertook as part of its 2005 WTO accession.

Table 2 reveals even more heterogeneity in the changes in average MFN applied tariffs across the G20 emerging economies taking place between 1993 and 2013. China and India began the early 1990s with extremely high applied tariffs that still averaged 56.3% and 39.1%, respectively. These countries subsequently underwent tariff liberalization reforms; by 2013, their MFN applied rates has been reduced to only 9.6 and 13.3%, on average. Indonesia, Mexico, and South Africa also had much lower applied MFN tariffs in 2013 relative to 1993. On the other hand, Argentina, Brazil, and Turkey began the period with mid-range applied MFN tariffs that have not changed much since. Finally, while Russia's applied MFN import tariffs were also mostly unchanged over these decades, Russia entered the WTO in 2012 and bound 100% of its tariffs at relatively low rates (see again Table 1, column 2); some of its applied tariff reductions are thus still being phased in.

Finally, the lower third of Table 2 indicates that the sample of developing countries has, for the most part, engaged in a general period of tariff liberalization over these 20 years. For all of the countries with available data, applied MFN tariffs in 2013 were significantly lower than they were in 1993. A number of these developing countries cut their average applied MFN tariffs by 20 percentage points or more from their levels in the early 1990s, when the average applied MFN tariff for Nigeria was 34.4%, for Kenya was 35.2%, for Thailand was 45.7%, for Pakistan was 50.8%, and for Bangladesh was 82.8%.

While the data in Table 2 suggest that tariffs were generally lower (or at least not much higher) in 2013 relative to 1993 for most of these 31 economies, our next investigation involves the inter-temporal path of this liberalization. In the higher frequency data, does liberalization appear to take place gradually, or were tariff cuts implemented in large increments? Whether continuous or discrete, was the liberalization a continual downward process or were there significant fluctuations so that tariffs fell initially, then increased (as policies were reversed), before falling again?

Fig. 5 plots the year-to-year change in the level of average applied MFN tariff rates across the three country groups over the WTO period of 1996–2013.[v] The annual changes for the United States, for example, are visually indistinguishable from zero during this period. In 1995, the United States began with extremely low applied MFN tariffs, applied MFN tariffs declined by an average of only 0.3 percentage points each in 1996, 1997, 1998, and 1999 as the United States implemented its Uruguay Round commitments, and there is little annual change to the US average applied MFN tariff after 2000. The same basic pattern holds for Australia, Canada, the EU and Japan. Korea is

[v] Again, in any given year, data for an entire country may be missing; in such cases the years that rely on such data are not plotted in the figure. To the extent that there are missing data in years that countries make substantial tariff changes, Fig. 5 would understate the extent of inter-temporal variation in applied tariffs.

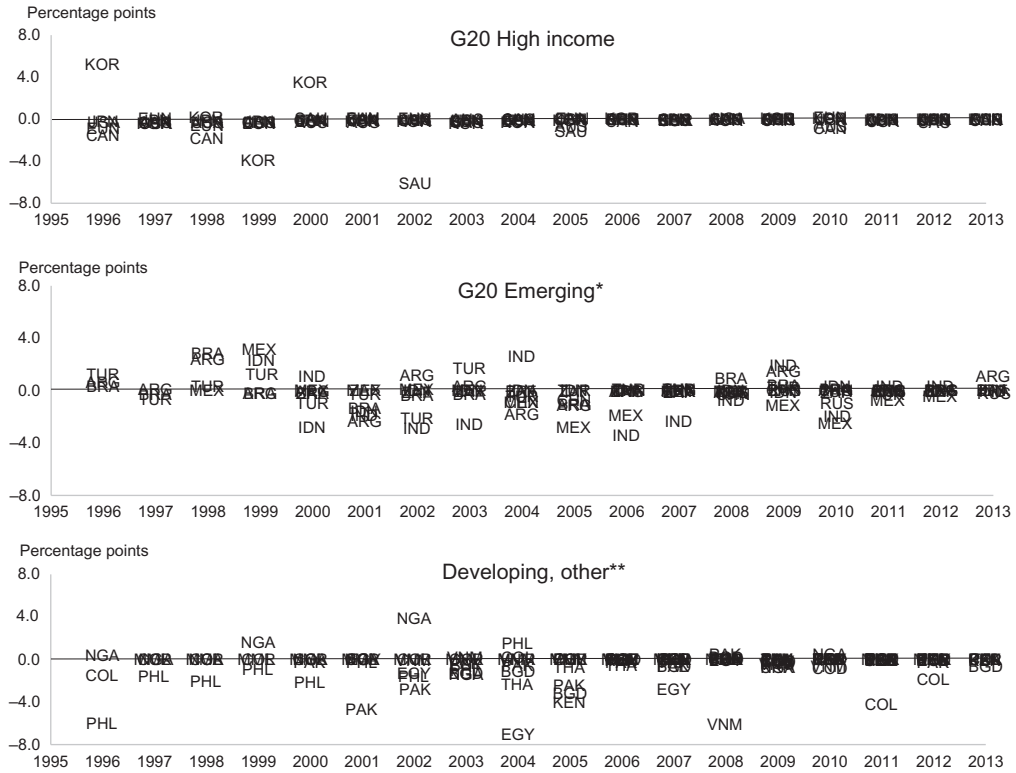

Fig. 5 Annual changes in average applied MFN tariffs 1996–2013, by country group.
*Constructed by the authors as the annual difference in the simple average MFN applied tariffs, with tariff data taken from WTO and UNCTAD/TRAINS. Data not comprehensively available for this period: missing are data for 6% of annual observations for high-income economies, 25% of observations for emerging economies, and 40% of observations for developing countries. For ease of exposition, not shown are known outliers defined as annual changes greater than (in absolute value) 8 percentage points. *One outlier is India (−10.8 percentage points in 2005). **A second outlier is Pakistan (−22.0 percentage points in 1999).*

the main high-income country exception during this period; its average applied MFN tariff increased by 5.2 percentage points in 1996 immediately preceding the Asian Financial Crisis, declined by 3.9 percentage points in 1999, increased by 3.5 percentage points in 2000, and only since has remained relatively stable, albeit at a high (relative to the other high-income G20 economies) average level.

For G20 emerging and other developing economies, Fig. 5 indicates more variation in the annual changes in average applied MFN tariffs. For example, the average applied MFN tariffs in Argentina and Brazil increased by 2.4 and 2.8 percentage points, respectively, in 1998, in part to address a recession associated with the contagion of the Asian Financial Crisis that had spread to Brazil. Argentina and Brazil then cut those tariffs by an average of 2.3 and 1.4 percentage points, respectively, in 2001, in the lead-up to

Argentina's abandonment of its fixed exchange rate regime and default in 2002. Turkey similarly had fluctuations in its average applied MFN tariff that were greater than 1 percentage point per year for 4 out of 5 years during 1999–2003 in the face of its own financial crisis. Of all of the major emerging economies, however, India had the greatest year-to-year fluctuations during this period. In 10 out of the 11 years between 2000 and 2010 India's average applied MFN tariffs changed by at least 1 percentage point—in some years it increased and in others it fell. For the other developing countries presented in the lower panel of Fig. 5, there is evidence of more variation in applied tariffs; nevertheless, the largest annual changes are primarily episodes of tariff cuts, some of which were associated with WTO accession (eg, Vietnam in 2008). While there is more variation in the higher frequency data for lower income countries compared to high-income countries, it is safe to conclude that there is not widespread evidence of frequent and large annual fluctuations in applied MFN tariffs taking place during this period for these countries under the WTO.

To summarize this section, overall, there is much more heterogeneity across countries as to the *changes* to their levels of average applied MFN tariffs that took place between 1993 and 2013. Interestingly, there is even substantial heterogeneity across countries within a given level of economic development, especially for the middle income countries. This is suggestive of the strong influence of country-specific factors affecting the timing of major changes to applied tariffs during these 20 years. Second, in most of these major economies, there were not large changes in average applied MFN tariffs on an annual basis during this period. There have been a few exceptions; many of the instances in which there was a sizeable *increase* can be tied to particularly acute economic crisis, and some instances in which there was a sizeable *decrease* can be tied to the timing of a country's applied tariff cuts to abide by WTO accession commitments.

In the remainder of this section, we briefly describe three different strands of the formal research literature examining patterns in the intertemporal changes in applied MFN tariffs.

The first strand examines the role of economy-wide shocks on government decisions to change the level of a country's import protection. Dating back to at least the Great Depression in the 1930s, there is a presumption that macroeconomic shocks can have significant effects on trade policy. Indeed, Irwin (2012) attributes much of the protectionism arising after the onset of the Great Depression to the inflexibility of exchange rates due to the gold standard; sharp real exchange rate appreciations that decrease the relative price of imports across the board may intensify import competition facing domestic producers and increase demands to raise applied tariffs.[w]

[w] There is also an historical literature, likely motivated by the 1929 stock-market crash and the US imposition of the Smoot–Hawley tariffs in 1930 (see also Irwin, 2011), that US tariffs are countercyclical (Bohara and Kaempfer, 1991; Cassing et al., 1986) and rise following periods of recession (negative or weak real GDP growth, increases in unemployment), high inflation, etc.

One potentially surprising outcome arising from Fig. 5, however, involves the Great Recession period of 2008–09. The evidence from this figure is that there was not a significant increase in average applied tariffs, despite the massive and simultaneous macroeconomic contraction that took place globally. Research that has begun to examine changes in applied MFN tariffs during the 2008–09 crisis includes Kee et al. (2013), Rose (2013), Gawande et al. (2015), and Foletti et al. (2011). Nevertheless, the fact that applied MFN tariffs did not increase significantly during the Great Recession does not necessarily imply that import protection overall is no longer sensitive to macroeconomic fluctuations. The "success" of WTO disciplines on tariff bindings in particular may have pushed countries to increase import protection during this period through other trade policy instruments, such as those that we introduce below in Section 3.1.[x]

A second strand examines the role of PTAs on changes to applied MFN tariffs, and whether preferential tariff liberalization serves as a "stumbling block" or a "building block" to future MFN applied tariff cuts (Bhagwati, 1991). Many of the PTAs described later in Section 2.3 also motivate 1993–2013 as being a useful period to study this question.

The evidence thus far of the impact of preferential tariff cuts on applied MFN tariff cuts has been mixed. Limão (2006) and Karacaovali and Limão (2008) examine the PTAs in effect as of the mid-1990s for the United States and European Union, respectively, and find stumbling block evidence that they significantly limited the MFN tariff cutting arising under the Uruguay Round. On the other hand, Estevadordal et al. (2008) present building block evidence from a set of Latin American countries that cut tariffs preferentially via free trade agreements in the 1990s and followed those up by then reducing their applied MFN tariffs.[y]

A third strand seeks to utilize any (plausibly) *exogenous* episodes of MFN applied tariff liberalization so as to exploit the unexpected nature of the shock. One episode worth highlighting is India's unilateral liberalization of the early 1990s (see again Table 2), which is an environment that has turned out to be a useful laboratory for conducting this sort of research.

[x] To foreshadow our discussion later, Bown and Crowley (2013a, 2014) consider the time-varying constraints on a country's applied MFN tariffs imposed by WTO tariff binding commitments as a contributing factor behind the substitution toward use of other trade policies in response to aggregate-level fluctuations, including during the 2008–09 crisis. On the other hand, another contributing explanation for the lack of responsiveness of import protection to macroeconomic shocks may be the lack of theoretical guidance for estimation, as there is not a robust theoretical literature linking business cycles and import protection. An exception is Bagwell and Staiger (2003).

[y] See also Limão (2007) for a theoretical motivation for the US results, as well as additional empirical evidence from the ASEAN Free Trade Agreement (described later) from Calvo-Pardo et al. (2011) and the Central American Free Trade Agreement-Dominican Republic (CAFTA-DR) from Tovar (2012).

Topalova and Khandelwal (2011) have examined the environment and empirically established that the MFN tariffs that India applied during the late 1990s were unrelated to standard political-economy determinants of its trade policy.[z] This important empirical result established India's IMF-mandated tariff cuts associated with its 1991–92 macroeconomic crisis and stand-alone agreement as an environment suited to assess a number of important research questions related to the impact of globalization on incentives and micro-level economic activity.[aa]

2.2 MFN Specific Duties Under the WTO

While the vast majority of import tariffs are applied as ad valorem duties, there are a number of important instances in which countries apply trade policy through specific, or per-unit duties. We first document the countries and sectors in which such duties continue to be applied. We then explore how a country's decision to apply an import tariff as a specific duty instead of an ad valorem duty can also affect our answers to questions regarding how the restrictiveness of an import tariff *changes* over time and whether a country's tariff discriminates *between* trading partners.[ab]

First consider countries' applied MFN tariffs imposed as specific duties. While the WTO (2014) reports that in most countries the share of product lines with non-ad valorem tariffs is zero, a number of major economies constitute sizeable exceptions. Fig. 6 reveals that specific duties remained a significant part of the applied MFN tariff policy arsenal in 2013 for many of the 31 major economies in our sample. Indeed, Russia had more than 11% of its product lines set as specific duties in 2013; Thailand, the United States, the EU, and India also apply specific duties to 5% or more of their imported products.[ac]

[z] Bown and Tovar (2011) use an alternative approach and find supporting evidence of this result by showing how India's applied MFN tariffs set in 1990 are consistent with the structural framework of the Grossman and Helpman (1994) model, but that the MFN applied tariffs in 2000–02 then become inconsistent with the model.

[aa] The Indian empirical environment in the 1990s has been used to study the impact of globalization on schooling and human capital acquisition (Edmonds et al., 2010), firm productivity (Krishna and Mitra, 1998; Topalova and Khandelwal, 2011), use of intermediate inputs (Goldberg et al., 2010a) product switching (Goldberg et al., 2010b), and customs evasion (Mishra et al., 2008), amongst others. Much of this literature is reviewed in detail in Goldberg and Pavcnik (2016).

[ab] We do not analyze computed *levels* of ad valorem equivalent estimates (AVEs) of the specific duties described here because the AVEs would be time varying for reasons unrelated to changes in policy. UNCTAD (via TRAINS) frequently provides ad valorem equivalent estimates for products with MFN tariffs applied as specific duties, using a number of different methodologies. These have been made freely available from the World Bank via the World Integrated Trade Solution (WITS) web-based software platform.

[ac] Of the WTO member countries not included in our sample, Switzerland is the only one with a higher share of imported products subject to specific duties than Russia in 2013, at 78.3%. Belarus and Kazakhstan have a customs union with Russia and thus roughly the same share of products subject to specific duties. Other countries with shares larger than 5% of imported products not shown in Fig. 6 include Norway (7.8), Zimbabwe (6.4), Uzbekistan (5.8), and Israel (5.0).

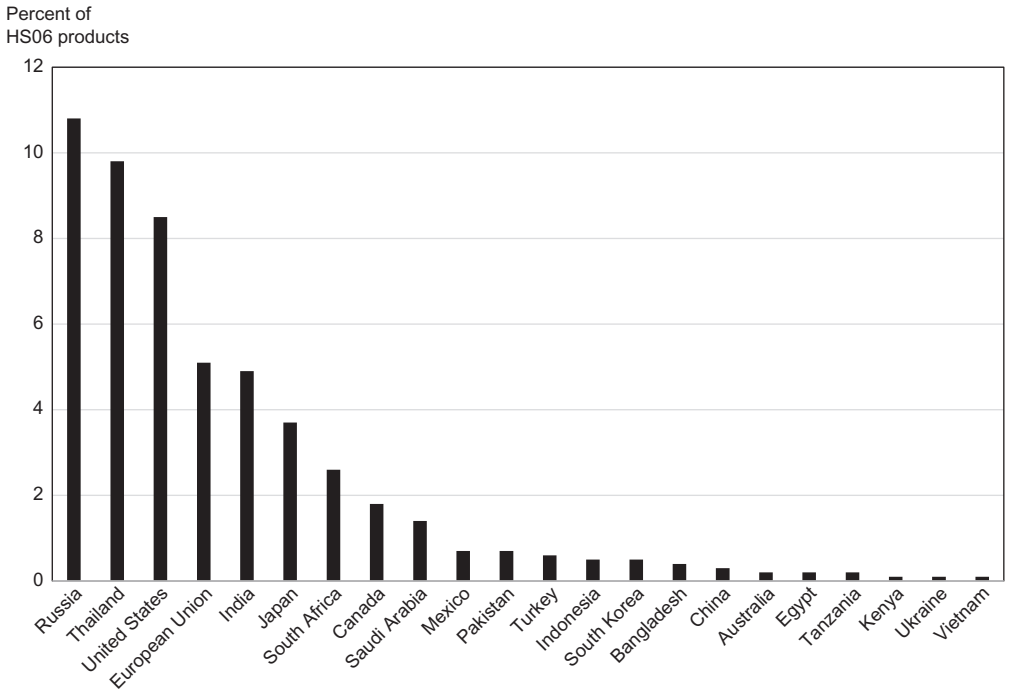

Fig. 6 Import products with MFN tariffs applied as specific duties in 2013, by country.
Constructed by the authors from WTO, 2014. World Tariff Profiles 2014. Geneva, WTO, UNCTAD, and ITC. Includes 31 economies from sample of Table 1; the remaining nine countries from Table 1 each had zero HS06 products with MFN tariffs applied as specific duties in 2013.

Fig. 7 further identifies the sectoral distribution of MFN tariffs applied as specific duties across our three country groupings. For the high-income economies, specific duties are overwhelmingly found in agriculture—more than 10% of animal products, more than 15% of vegetables, and nearly 25% of foodstuffs report MFN tariffs being applied as specific duties. A smaller, though still nontrivial, incidence of specific duties is found in sectors such as footwear, textiles and clothing, and fuel. For the United States, MFN tariffs are applied as specific duties for nearly 50% of vegetables and foodstuffs, 27% of animal products, 10% of minerals, 16% of fuels, 9% of textiles and apparel, 21% of footwear, and 18% of miscellaneous products.

Second, and as we further describe in Section 3, MFN applied tariffs are not the only instrument of trade policy in which specific duties are found to arise; they are also a somewhat common outcome of temporary trade barrier investigations. In some instances, a newly imposed antidumping or safeguard restriction may result in a new and additional specific duty, even though the benchmark trade policy had been applied as an ad valorem import duty.

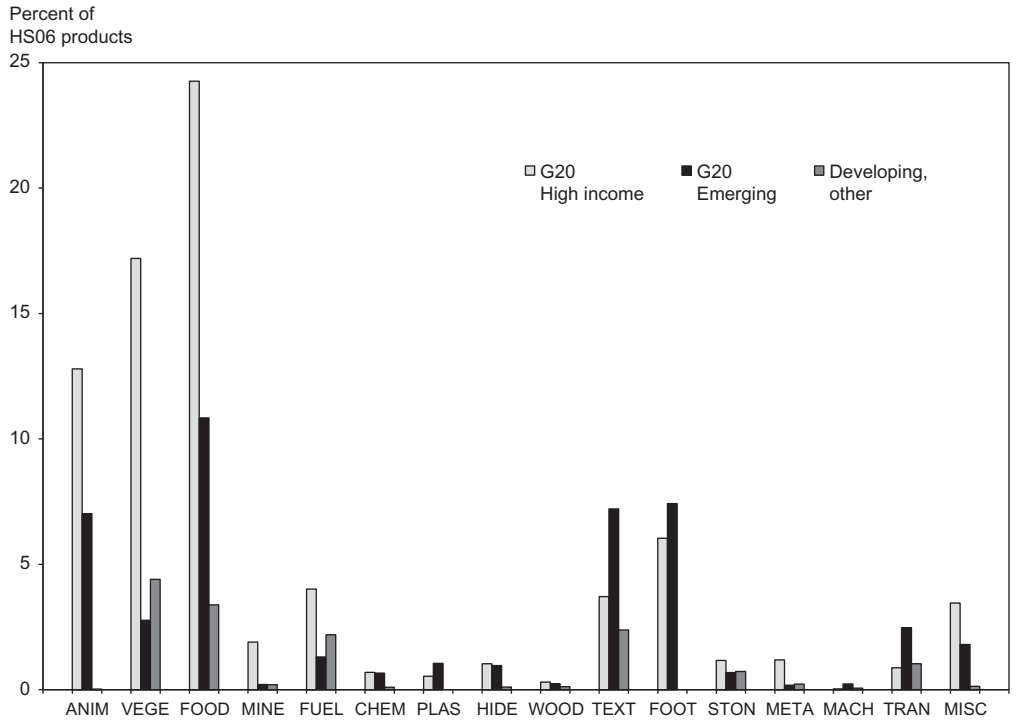

Fig. 7 Import products with MFN tariffs applied as specific duties in 2013, by industry and country group. *Constructed by the authors from tariff data at the HS-06 level from the WTO and UNCTAD/TRAINS. Country groupings based on Table 1 and includes all countries, even those revealed in Fig. 6 as having zero MFN tariffs applied as specific duties.*

An open research question is what explains the cross-country and sectoral variation in MFN tariffs applied as specific duties, and in particular, the relatively high incidence in agriculture, textiles and clothing, and footwear in high-income economies. Given that the US applied specific duties much more prevalently across products during the pre-GATT period (Irwin, 1998a,b), this may be equivalent to asking why specific duties applied in the 1940s in these sectors were less likely (than those applied in other sectors) to be converted to ad valorem rates.[ad]

[ad] An approach structured similar to Ludema and Mayda (2013) may provide a partial explanation. The Ludema–Mayda result is that high import tariffs in certain sectors (eg, agriculture, textiles and apparel, and footwear, see again Fig. 2) can be linked to diffuse exporting interests in the rest of the world; the implication is that the lack of exporter concentration has led to fewer demands under GATT negotiating rounds that importers lower their tariffs. With respect to an explanation for the pattern of specific duties, perhaps the free rider problem not only resulted in these sectors maintaining high levels of applied tariffs, but it also meant that negotiators never got around to bargaining to convert the form of the policy from a specific duty to an ad valorem rate.

We conclude with a brief discussion of reasons why the existence of specific duties remains important, especially for two of the thematic questions of our chapter.[ae]

The first involves the role of prices and *changes* in the trade-restrictiveness of different forms of tariffs—ie, ad valorem vs specific rates—even when policymakers do not make changes to their applied levels. The US experience with the Smoot–Hawley tariffs of 1930 over the period of the Great Depression demonstrates the changes that can occur with specific duties. Because many Smoot–Hawley tariffs were specific duties, their trade-restrictiveness *increased* over the 1930s in the face of deflation and falling domestic prices. Conversely, the high ad valorem equivalent rate of these specific duties in the early 1940s implies that much of the subsequent tariff "liberalization" of US import markets during the 1940s arose not because of particular policy decisions to cut tariffs, but simply because inflation increased, thereby reducing the ad valorem equivalent of the imposed specific duty (Crucini, 1994; Irwin, 1998a,b).

Fig. 7 suggests that, for high-income economies and agricultural markets, the trade restrictiveness of tariffs imposed as specific duties will increase during deflationary periods, which is (not coincidentally) when the sector is more likely to be injured and seeking additional protection from import competition. This suggests a potential explanation for the puzzling existence of particularly large amounts of binding overhang for agricultural goods in the developing and emerging economies (see again Fig. 2) that apply tariffs as ad valorem duties in agricultural products. Unlike high-income countries with specific duties, the *form* of the applied tariffs in lower income countries implies that they do not have a natural buffer against negative world price shocks.

Second, specific duties implicitly discriminate between trading partners (in ways that an ad valorem tariff would not) without violating the MFN rule when there are heterogeneous varieties of differentiated products included in the same tariff code. Consider, for example, two varieties of shoes from two different countries that fall within the same product category and which therefore face the same applied MFN tariff rate. Suppose those two varieties of shoes have different prices because of quality differences (Schott, 2004). The ad valorem equivalent of a $2 specific duty on a $10 pair of shoes (say, from China, Indonesia, or Vietnam) is 20%, whereas the ad valorem equivalent on a $100 pair of shoes (say, from Italy) is only 2%. While the ad valorem equivalent of an MFN-consistent specific duty is clearly discriminatory across trading partners, it is permissible under the WTO.[af]

[ae] A final issue that we do not address here is that the application of a specific duty and ad valorem duty can differ in their efficiency as a form of taxation. This is particularly the case under different market structures, as has been discussed in the public finance literature (Delipalla and Keen, 1992 and Keen, 1998).

[af] The use of specific duties at the conclusion of "safeguard" investigations—see Section 3.1—is particularly noteworthy because this policy was designed by the WTO Agreements to be less discriminatory than other policy tools, like antidumping. In practice, the use of safeguards is a politically useful way for governments to discriminate between foreign suppliers, such as against varieties from a low-priced trading partner while minimizing the impact on a high-priced trading partner. See, for example, Turkey's safeguards on imports of footwear described in Bown et al. (2015).

2.3 Ad Valorem Import Tariffs Under Preferential Trading Arrangements

Lower tariffs can create trade, but when a country offers lower tariffs preferentially and selectively so as to discriminate between trading partners, the result can also be a distortion of trade. Here, we provide an investigation into our fourth thematic question: when setting tariffs, do countries discriminate in important ways across their trading partners?

This question is both important and difficult to answer. First, the number of preferential trading arrangements (PTAs) in existence has exploded since the early 1990s; yet, as we established in Section 2.1.4, this period also coincides with a broad decline in applied MFN tariffs for many countries. Second, the WTO (2011) has found that the share of intra-PTA trade in world trade has nearly doubled from 18% in 1990 to 35% in 2008; including intra-EU trade in these calculations leads to an increase from 28% in 1990 to 51% in 2008. Yet, in a detailed study of PTAs involving 85 countries and 90% of world trade in 2007 that matches bilateral imports to tariffs at the product level, the WTO (2011) also reports that only 16% of global trade was eligible for any preferential tariffs (30% if intra-EU trade is included). Put differently, this would imply that 84% (70%) of world merchandise trade was still taking place on an MFN basis. How can this seeming contradiction between the rise of PTAs, the rise of intra-PTA trade, and yet the continued importance of MFN tariffs, be reconciled?

We begin in Section 2.3.1 by defining and then introducing the different forms of PTAs that have arisen across the trading system. The many different arrangements that countries use to implement a lower tariff toward a particular trading partner—arrangements which comply with basic GATT/WTO exceptions to the MFN principle of nondiscrimination—include free trade agreements, customs unions, unilateral preference schemes, and the lesser-known partial scope agreements.[ag]

Section 2.3.2 provides more detail on the potential economic significance of tariff preferences arising under these PTAs. We begin by characterizing the scope of products for which countries can and do offer tariff preferences (given their MFN tariffs), the size of the discriminatory preference margins that are granted, and the trading partners to which they are being offered. Our product-level bilateral tariff preference data is sufficiently rich that we can examine the bilateral tariff rates offered by 27 of our economies to the 30 trading partners in our sample.[ah]

While we document considerable variation across countries, a number of interesting patterns emerge. First, high-income countries, which generally have very low MFN

[ag] These exceptions include the original GATT 1947's Article XXIV and the 1979 "Enabling Clause" that permits nonreciprocal and noncomprehensive preferential tariff coverage for developing countries involved in PTAs.

[ah] Bilateral tariff data is not available for four of the countries in our analysis. Furthermore, for tractability, we restrict the analysis to variation across 30 trading partners. This obviously misses additional variation associated with other trading partners.

tariffs, have relatively fewer products over which they can offer any preferential tariffs. These countries tend to offer preferential treatment to *many* trading partners where they can; however, their tariff preference margins are typically quite small because their applied MFN tariffs are already so low. On the other hand, lower income countries have many more products for which they could offer preferential tariffs, and yet the patterns to their offerings are much different. Developing countries do sometimes offer lower tariffs; the main distinction is that their offerings are much more limited—to fewer selected partners and/or over fewer selected products. Not surprisingly, for the products in which developing countries do offer lower-than-MFN tariffs to someone, the tariff preference margin can actually turn out to be quite high. Finally, we document patterns in the *recipients* of these tariff preferences. Developing country exporters are the most frequent recipients. Whether high-income country exporters receive lower-than-MFN tariffs varies widely across preference-offering countries; nevertheless, there are many fewer examples of lower-income countries granting tariff preferences to high-income countries.

Finally, in Section 2.3.3 we detail the tariff preferences offered by one country in particular. We utilize the United States to highlight additional margins along which countries can be shown to discriminate with respect to their applied preferential tariff policies.

2.3.1 Major Economies and Their Preferential Trading Arrangements

We begin with a brief definition of each of the four major types of PTAs. A free trade agreement is typically a reciprocal agreement in which two or more countries offer zero tariffs to one another for virtually all products. A customs union is an FTA with the additional feature that the members of the FTA have a common external trade policy, including a commonly applied MFN tariff, on imports from all nonmembers. Unilateral preferences are an arrangement whereby one country—typically a high-income country—offers lower-than-MFN tariffs to one or more developing countries for a selection of imported products. A partial scope agreement is an arrangement whereby two or more developing countries offer one another lower-than-MFN tariffs for a selection of imported products. For these last two forms of PTAs, in practice, the selection can be much less than 100% of products.

As of 2015, more than 250 regional trade agreements (free trade agreements, customs unions, partial scope agreements) covering international trade in goods were in force (WTO, 2015c); additionally, WTO members were offering nearly 30 different unilateral preference programs (WTO, 2015a).[ai]

[ai] Given that multiple agreements or preference schemes frequently apply to the same bilateral tariff relationship for a given product, it is difficult to interpret the economic meaning of the raw number of agreements or programs in effect. For example, within the regional trade agreement figures, Thailand is part of the original ASEAN agreement; ASEAN has an FTA with Australia, and Thailand has its own bilateral FTA with Australia. A separate example of redundancy in unilateral programs is some preference-offering countries make exporters from a certain country eligible for multiple unilateral schemes.

Table 3 lists a number of prominent examples of different types of PTAs between countries in our 31 economy sample. The most common form of preferential arrangement is a free trade agreement (FTA). The United States is involved in a number of FTAs, including NAFTA (with Canada and Mexico), and bilateral FTAs with Australia, Colombia, and Korea. The European Union with its 28 member countries is an example of a customs union. The EU also has a separate customs union with Turkey (sharing a common external MFN tariff toward third countries), and the EU has a number of FTAs (not customs unions) with other countries including Colombia, Egypt, Korea, Mexico, and South Africa.

Groups of developing and emerging economies have also formed FTAs or customs unions between themselves— ie, without involvement of high-income economies. The Southern Common Market (MERCOSUR) is a customs union between Argentina, Brazil, Paraguay and Uruguay. A prominent example of a primarily developing economy FTA is the Association of Southeast Asian Nations (ASEAN) which involves Brunei, Burma, Cambodia, Indonesia, Laos, Malaysia, Philippines, Singapore, Thailand, and Vietnam. ASEAN has also negotiated FTAs with Japan, Australia, China, India and Korea through what are frequently referred to as "hub and spoke" agreements—eg, Japan, China, and Korea each had a bilateral FTA with ASEAN but they did not (as of 2015) have separate free trade agreements in force with each other.[aj] Furthermore, the East African Community is a customs union between Burundi, Kenya, Rwanda, Tanzania, and Uganda. The Common Market for Eastern and Southern Africa (COMESA) is an FTA between 19 countries in Africa (including DR Congo, Egypt, Ethiopia and Kenya) that launched a customs union in 2009.

Partial scope arrangements (PSAs) are the least common form of PTA and they have arisen among low- and middle-income economies. A country involved in a PSA typically submits a list of products—ranging from a few dozen to a few hundred—over which it offers preferential tariffs to all other signatories to the agreement. One example of a partial scope agreement is the Asia-Pacific Trade Agreement (APTA) in which Bangladesh, China, India, Laos, Korea, and Sri Lanka participate. Further, the Global System of Trade Preferences (GSTP) has 43 participants including Argentina, Brazil, Egypt, India, Indonesia, and Nigeria. Finally, MERCOSUR has also negotiated a less-than-comprehensive (bilateral) partial scope agreement with India.

The lower rows of Table 3 list economic development-oriented unilateral preference schemes in force as of 2015. Seven different economies offered preferences to developing economies via their unique implementation of the Generalized System of Preferences (GSP). Under these schemes, a preference-granting country decides unilaterally what trading partners and what products will be offered favorable tariff treatment. Furthermore, the

[aj] However, Korea and China did offer some preferences toward one another as they were both signatories to the Asia-Pacific Trade Agreement (APTA), a partial scope agreement. China and Korea announced the formation of a new FTA in June 2015, but it was not yet in force by the end of the year.

Table 3 Major preferential trade arrangements in force in 2015

Type of arrangement	Number in force	Major examples
Free Trade Agreement (FTA)	233	North American Free Trade Agreement (NAFTA) US–Australia, US–Colombia, Korea–US Canada–Colombia, Canada–Korea EU–Colombia and Peru, EU–Egypt, EU–Korea, EU–Mexico, EU–South Africa, EU–Ukraine Association of Southeast Asian Nations (ASEAN) FTA ASEAN–Japan, ASEAN–Australia–New Zealand, ASEAN–China, ASEAN–India, ASEAN–Korea India–Japan Japan–Australia, Japan–Indonesia, Japan–Mexico, Japan–Philippines, Japan–Thailand, Japan–Vietnam Korea–Australia, Korea–India Pakistan–China Thailand–Australia Turkey–Egypt Turkey–Korea Ukraine–Russia
Customs Union (CU)	19	European Union (EU) EU–Turkey MERCOSUR (Southern Common Market) East African Community Common Market for Eastern and Southern Africa (COMESA)
Partial Scope Agreement (PSA)	14	Asia-Pacific Trade Agreement (APTA) Global System of Trade Preferences (GSTP) Latin American Integration Association (ALADI) MERCOSUR–India
Unilalteral Preference Scheme	28	Generalized System of Preferences (GSP) schemes: Australia, Canada, European Union, Japan, Russia, Turkey, United States Duty-free treatment for certain less developed countries (LDCs): China, Korea, India, Thailand Other examples: African Growth and Opportunities Act (AGOA)–US Trade preferences for Pakistan–EU

Constructed by the authors from WTO, 2015a. Database on preferential trade arrangements. Available from: http://ptadb.wto.org/default.aspx (accessed 30 December); WTO, 2015c. Regional trade agreements information system. Available from: http://rtais.wto.org/UI/PublicMaintainRTAHome.aspx (accessed 30 December). The list of "major examples" is not comprehensive as it omits preferential trade arrangements that do involve at least two of the major economies listed in Table 1.

United States and European Union offer other unilateral preference programs in addition to GSP, such as the African Growth and Opportunities Act (AGOA) offered by the United States, and an additional set of tariff preferences (covering 75 products) that the EU offered to Pakistan in response to devastating floods in 2010. China, Korea, India and Thailand also have programs whereby they offer tariff preferences over a specified set of products but only to a smaller set of imports arising from least developed countries (LDCs).[ak]

2.3.2 Preferential Tariffs Across Countries

Table 4 summarizes information on bilateral tariffs that 27 of our major economies apply toward their trading partners as of 2014. It addresses the question: how much do countries discriminate among trading partners through their application of lower-than-MFN tariffs? We capture the extent of the favorable tariff treatment along two dimensions: (1) a quantity dimension, which we capture as the share of imported products that receive a tariff reduction; and (2) a price dimension, which is the depth of the tariff reduction relative to the applied MFN tariff for a particular product.

To interpret Table 4, we begin by assessing the tariff information for the European Union.[al] As we observed in Table 3, the EU has FTAs with many countries, including Colombia, Egypt, Mexico, South Africa, and Korea. Furthermore, the EU offers a number of unilateral preference programs and its own GSP program. One interesting point of comparison is that the EU's list of GSP-eligible countries has historically included China, which has not been a recent GSP recipient under the US program that we introduce later.[am] Finally, the EU has also formed a customs union with a nonmember Turkey and thus the two share a common external applied MFN tariff vis-à-vis imports from third countries.[an]

[ak] The United States and EU had other preference programs to primarily least developed and small economies in effect that are not described here as they do not apply to the exporting countries in our sample. For a more complete analysis of such programs, see Ornelas (2016).

[al] Recall that the 28 current countries that are EU members not only have a common internal market with zero tariffs toward trade from one another (an FTA), but they have also ceded their national trade policy to a collectivized central authority (the European Commission) in Brussels that sets its common external trade policy vis-à-vis the rest of the world (thus creating a customs union). The post-World War II integration of Europe proceeded from the Treaty of Paris in 1951, to the Treaty of Rome in 1957 which established an internal FTA and customs union between six countries, to subsequent accessions over time before reaching the current 28 countries. Most recently the EU integration process has deepened beyond trade policy to cover factor markets and notably many forms of domestic regulations.

[am] The European Commission did finally graduate China from its GSP program as of 2015.

[an] The EU–Turkey customs union is much less complete than the EU's "internal" customs union based on a number of different measures. First, recall from Table 1 that the economies have undertaken different levels of tariff binding commitments at the WTO. Second, their average applied MFN rates are different because agriculture is excluded entirely, and there are special provisions for steel, textile, and apparel products. Third, as described later in Section 3.1, the EU and Turkey each also administer their own temporary trade barrier policies of antidumping, countervailing duties, and safeguards and in some instances even apply these toward imports from each other (Bown, 2014b).

Table 4 Bilateral import tariff characteristics under PTAs for selected economies, 2014

	All products	Preference possible (PP) products with nonzero applied MFN tariffs						
	MFN applied tariff	PP products (% of all HS06 products)	Products given preferences (% of all PP products)	Products given preferences (% of all products)	MFN applied tariff, all PP products	MFN applied tariff, preference given	Bilateral applied tariff, preference given	Bilateral tariff preference margin, preference given
Country	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
G20 High income								
Australia	2.7	52.5	39.8	20.9	5.1	5.0	0.6	4.4
Canada	2.2	31.3	58.8	18.4	7.1	6.7	1.5	5.2
European Union	5.6	76.0	78.7	59.8	7.3	6.6	1.8	4.8
Japan	2.8	47.5	64.4	30.6	5.8	5.2	0.8	4.4
Saudi Arabia	4.7	89.7	3.6	3.2	5.3	5.3	0.0	5.3
United States	2.9	58.0	59.7	34.6	5.1	4.2	0.1	4.1
G20 Emerging								
Argentina	13.6	96.7	10.0	9.7	14.1	13.5	2.5	11.0
Brazil	13.6	96.8	10.2	9.9	14.0	13.7	3.9	9.8
China	9.6	93.6	52.8	49.4	10.3	9.3	0.7	8.6
India	12.4	97.3	3.6	3.5	12.7	15.0	9.2	5.8
Indonesia	7.2	90.6	23.7	21.5	8.0	7.2	0.6	6.6
Mexico	7.4	57.0	20.3	11.6	12.9	12.6	2.5	10.1
Russia	8.8	89.4	20.2	18.1	9.9	11.1	5.7	5.4
South Africa	7.5	43.7	6.8	3.0	17.3	17.3	2.1	15.2
Turkey	10.8	80.4	67.1	53.9	13.4	5.6	1.9	3.7

Continued

Table 4 Bilateral import tariff characteristics under PTAs for selected economies, 2014—cont'd

	All products	Preference possible (PP) products with nonzero applied MFN tariffs						
	MFN applied tariff	PP products (% of all HS06 products)	Products given preferences (% of all PP products)	Products given preferences (% of all products)	MFN applied tariff, all PP products	MFN applied tariff, preference given	Bilateral applied tariff, preference given	Bilateral tariff preference margin, preference given
Country	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Developing, other								
Bangladesh	14.6	93.5	2.0	1.9	15.6	22.6	21.2	1.4
Burma	5.6	96.9	4.6	4.5	5.8	13.4	4.9	8.5
Colombia	6.3	54.2	18.7	10.1	11.7	11.9	1.9	10.0
Egypt	16.8	90.6	10.7	9.7	18.6	18.6	5.6	13.0
Ethiopia	17.3	95.7	7.1	6.8	18.1	18.1	16.3	1.8
Kenya	12.8	63.8	10.7	6.8	20.0	20.0	0.7	19.3
Pakistan	13.4	94.3	5.2	4.9	14.2	15.1	13.1	2.0
Philippines	6.3	98.2	13.8	13.6	6.4	6.4	0.6	5.8
Thailand	10.7	78.3	17.6	13.8	13.6	13.5	0.3	13.2
Tanzania	12.8	63.8	3.6	2.3	20.1	20.1	0.0	20.1
Ukraine	4.4	63.8	3.6	2.3	6.9	6.9	0.0	6.9
Vietnam	9.3	64.9	22.5	14.6	14.4	15.3	4.8	10.5

Constructed by the authors with bilateral tariff data at the HS06 level for each importing economy vis-à-vis its 30 trading partners listed in Table 1. Data does not include ad valorem equivalent estimates for tariffs applied as specific duties. For countries for which 2014 data is not available, comprehensive data from the nearest available year was utilized. Not included are DR Congo, Iran, Korea, and Nigeria, for which bilateral tariff preference data were incomplete. G20 = Group of 20. Columns (1), (5), (6), (7), and (8) are simple averages of ad valorem rates; column (2) is share of all import products; and columns (3) and (4) are shares of all product-trading partner pairings.

Beginning with column (1), recall the EU's simple average applied MFN tariff rate was 5.6%.[ao] Column (2) indicates that 76.0% of all HS06 products have nonzero MFN applied tariffs and are thus what we define as products that are "preference possible." Column (3) introduces the trading partner dimension and reports that the EU granted preferences for 78.7% of the preference possible goods to these 30 exporting countries. Overall, column (4) reports that the EU offers a lower-than-MFN tariff for 59.8% of all HS06 products entering the EU from these 30 partners. These statistics for the EU suggests a broad application of preferential tariffs.

Since the EU's lower-than-MFN offerings do not cover 100% of preference possible products, an interesting follow-up question arises. Does the EU typically grant preferences in products that have high or low applied MFN tariffs? Compare column (5), which reports the average applied MFN tariff for the EU's preference possible products (7.3%) with column (6), which reports the average applied MFN tariff for the selected group of products (and trading partner pairs) for which the EU offers (6.6%). Perhaps not surprisingly, the EU offers bilateral preferences in products for which the average applied MFN tariff is already relatively low.[ap] This is consistent with expectations that the EU would find it more difficult to offer preferences in products that start with relative high applied MFN tariffs.

Along the price dimension, how "deep" are the EU's tariff preferences? First note that, unlike many other high-income economies, the EU frequently does not cut its lower-than-MFN tariff all the way to zero; ie, column (7) indicates that the average applied bilateral tariff (when a tariff preference is offered) remains at 1.8%. The EU's average preference margin is thus 4.8%, or the difference between columns (6) and (7).

More generally, Table 4 reveals a number of stylized facts on the scope and the depth of preferential tariff offerings across countries.

First, consider the scope of preference possible products and the breadth of preferential tariff offerings. For high-income economies, although there are few products overall in which they can offer tariff preferences, they tend to offer preferences for relatively large shares of these goods. While the EU is at the high end, Australia, Canada, Japan and the US offer bilateral tariff preferences for between 18% and 35% of all products. On the

[ao] Due to the limited availability of ad valorem equivalent estimates for the bilateral (and some of the applied MFN) tariffs applied as specific duties, this section only relies on the products for which tariffs are imposed as ad valorem duties. Because the HS06 products with tariffs applied as specific duties have higher (on average) ad valorem equivalent estimates than the HS06 products with tariffs applied as ad valorem duties (see discussion in Section 2.2), these data on average tariffs will differ from other parts of this chapter. We would expect the differences (or potential mis-measurement) to be larger for the economies that are major users of specific duties, such as Russia, United States, EU, Japan and India, and in sectors where specific duties are more prominent, including agriculture, footwear, textiles and apparel.

[ap] While not shown in Table 4, the EU's average applied MFN tariff for the 21% of products and trading partners in the sample that were not granted a preference was 10.1%.

other hand, the breadth of preferential tariff offerings is comparatively modest in middle and low income countries, despite them having so many more preference possible products to potentially offer. Although many lower income countries could offer preferences in more than 90% of products, they typically offer bilateral tariff preferences in 5–20% of these goods. Among developing and emerging economies, the main exceptions are China, Indonesia, and Turkey, each of which offers lower-than-MFN tariffs on substantially more products.

Second, consider the depth of the bilateral tariff preference offerings. For high-income economies, conditional on a preference being granted, the average bilateral preference margin is only in the range of 4–5 percentage points. In contrast, when poorer countries offer bilateral tariff preferences, the bilateral tariff preference margin is typically much higher (column 8). The average bilateral tariff preference margin offered by China is 8.6 percentage points, by Mexico is 10.1 percentage points, by Argentina is 11.0 percentage points, and by South Africa is 15.2 percentage points. For other poorer countries, the average bilateral tariff preference margin can be as high as 19–20 percentage points (Kenya, Tanzania). Thus even though these lower income countries offer lower-than-MFN tariffs to many fewer product-trading partner pairs, when they do offer such a preference, the margin can be quite large.

Finally, to whom do these countries offer bilateral tariff preferences? Fig. 8 illustrates the export recipients in 2014; consider again the data for the European Union. The EU offered a bilateral tariff preference to developing country exporters in 89% of these preference possible products and to middle income countries in 95% of products.[aq] On the other hand, it offered a tariff preference to high-income countries in only 32% of available products.

In general, high-income economies in Fig. 8 tend to provide the largest share of their realized offerings of preference possible products to developing countries, primarily through GSP-type programs (see again Table 3) but also increasingly through FTAs. With the exception of Australia, high-income economies offer the fewest preferences to other high-income economies; they offer much more to emerging and developing countries. Indeed, Japan (and Saudi Arabia) offered zero tariff preferences to other high-income economies in these data. However, this pattern may also change if the Trans-Pacific Partnership (TPP) (which includes Australia, Canada, Japan, and the United States) and the Transatlantic Trade and Investment Partnership (which includes

[aq] Note that this ordering is reversed for most of the other high-income countries which tend to offer preferences in more products to poorer countries. The EU's results stem from its FTAs with Mexico and South Africa, and its customs union with Turkey. Furthermore, unlike the United States in 2014, for example, the EU also offered GSP eligibility to Argentina, China and Russia. These countries were removed from the EU GSP program in 2015.

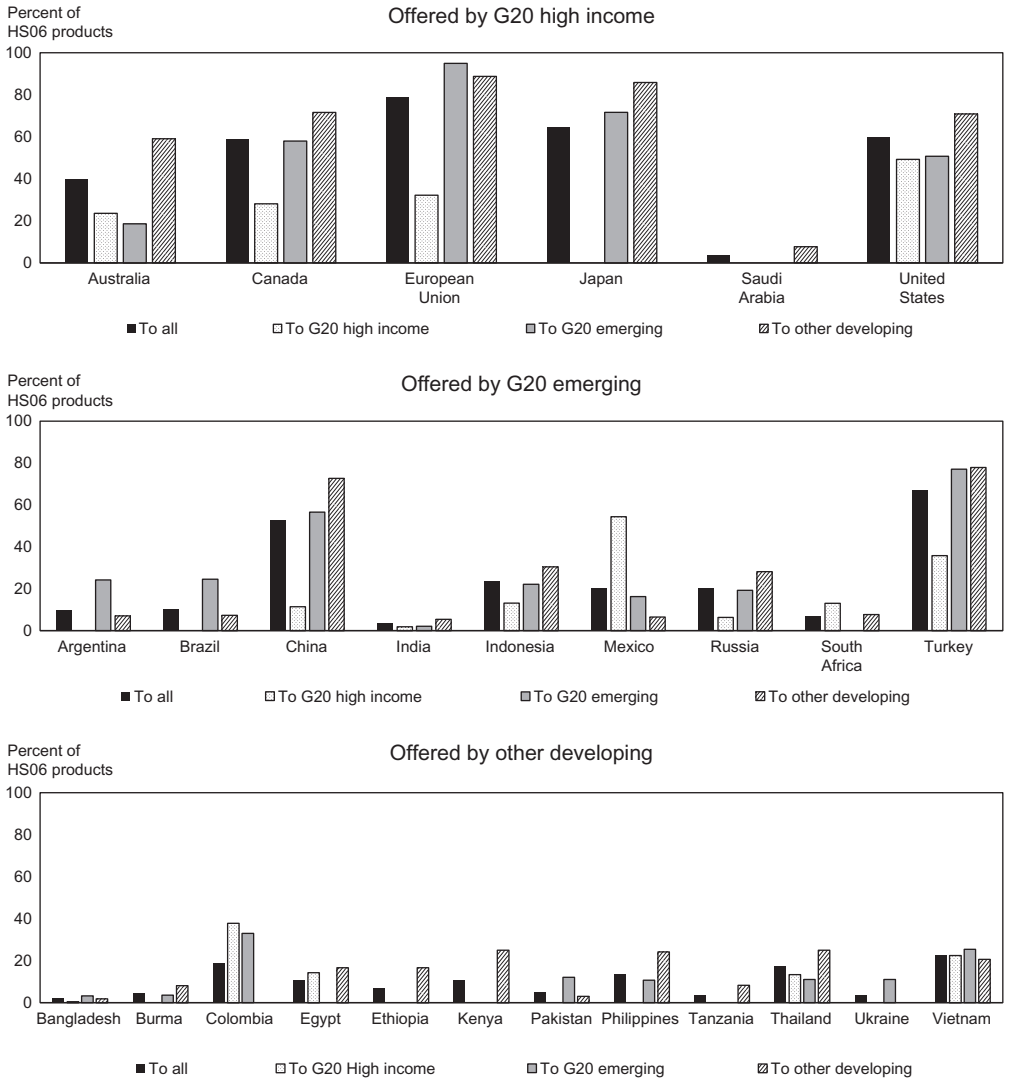

Fig. 8 Bilateral tariff preference offerings by policy-imposing economy, 2014.
Constructed by the authors with bilateral tariff data (policy-imposing economy vis-à-vis 30 trading partners listed in Table 1) at the HS06 level from UN International Trade Center. Data illustrates percent of the "preference possible" HS06 products for which the policy-imposing economy offers bilateral tariffs to exporting countries in each group. For list of exporting countries in each group (G20 high income, G20 emerging, and other developing) see Table 1.

the EU and United States) negotiations result in FTAs that include the standard comprehensive reciprocal tariff reductions between members.

Fig. 8 also reveals substantial variation for the bilateral preferences offered by emerging economies. India has the most preference possible products and yet offers the fewest preferences overall (see again column 3 of Table 4). Argentina and Brazil also tend to offer relatively few bilateral preferences to the countries in this sample; on the other hand, China and Turkey offered the most preferences in the set of emerging economies and have levels of offerings comparable to some high-income countries. Mexico stands out by way of the concentration of its tariff preferences toward high-income economy exporters—recall its NAFTA participation (with the United States and Canada) and its bilateral FTAs with the EU and Japan.

The lowest panel of Fig. 8 reveals the pattern of bilateral tariff preferences that developing countries offered in 2014. Overall, they offered fewer bilateral preferences across all exporter recipient groups. Their limited preferential offerings go toward other developing countries; these frequently arise through PSAs, or in the case of African countries, through customs unions like the East African Community or COMESA. Colombia, Egypt and the countries involved in ASEAN are the only ones offering tariff preferences to high-income economy exporters, and these are primarily through FTAs.

Before concluding this section, we briefly describe research that has begun to explore the *determinants* of bilateral tariffs. In particular, Blanchard et al. (2016) focus on global supply chain determinants and use a sample of 14 high-income and emerging economies over 1995–2009. They find that bilateral final goods tariffs are decreasing in the amount of domestic value added embodied in foreign production and the amount of foreign value added embodied in domestic production. In related work, Blanchard and Matschke (2015) examine US bilateral tariff preferences and find that US multinational affiliates' offshoring behavior impacts the likelihood of a trading partner being granted such as preference. Overall, however, the existing literature in this area is quite thin, which is somewhat surprising given the substantial increase in preferential tariff offerings arising since the early 1990s. However, the tremendous variation in the data shown here suggests this as a potentially fruitful environment for additional research.[ar]

2.3.3 Tariff Preferences Offered by the United States

Here, we extend the analysis to provide a more detailed assessment of the variation in the United States' preferential tariff offerings under its various PTAs. Fig. 9 breaks out

[ar] There is a larger literature on the determinants of preferential trading arrangements at the aggregate level; see, for example, Baier and Bergstrand (2004) and Baier et al. (2014). Furthermore, there are also expansive literatures on the impact of preferential tariffs—both on trade flows and on other trade policy-setting behavior. Limão (2016) surveys the literature on preferential trading arrangements. For the impact of tariff preferences arising under unilateral preference programs such as GSP; see Ornelas (2016). For a broader comparison of the WTO and PTAs, see Bagwell et al. (2016).

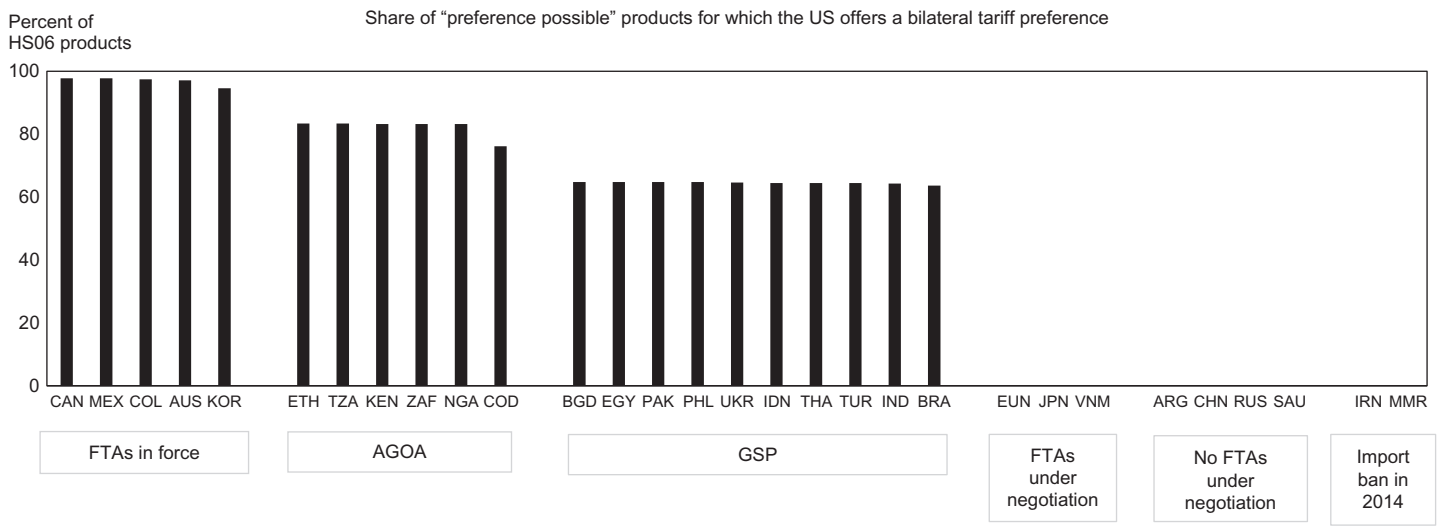

Fig. 9 United States's bilateral tariff preferences toward major economies, 2014.
Constructed by the authors with bilateral tariff data at the HS06 level from UN International Trade Center. “Preference possible” products, defined as HS06 products with nonzero applied MFN tariffs in 2014 (58.0% of US imported products), not including products with tariffs applied as specific duties. For country acronyms, see Table A.2.

bilaterally the United States' share of these preference possible products for which it actually granted a lower-than-MFN tariff in 2014. As previously observed in Table 3, the United States offers some bilateral tariff preferences to countries via free trade agreements including NAFTA (with Canada and Mexico), and bilateral FTAs with Australia, Colombia and Korea. The United States offered a lower-than-MFN tariff in 2014 for close to 100% of preference possible products to each of these countries. In the few instances in which a product was not offered a bilateral tariff preference, it is typically associated with the more recent agreements (Colombia, Korea) that were not yet fully phased in.

US trading partners also receive lower-than-MFN applied tariffs under unilateral preference offerings. In 2014, the United States offered tariff preferences to trading partners under a number of different unilateral programs; for the trading partners in our sample, this includes the African Growth and Opportunity Act (AGOA) and the Generalized System of Preferences (GSP). Fig. 9 indicates differences in the comprehensiveness (product coverage) across the different US programs. For example, the US offered tariff preferences for more than 80% of possible products for African countries such as Kenya or Tanzania (which are eligible for AGOA) and only 65% of possible products for Bangladesh or Pakistan (which are eligible for GSP), despite these countries all having comparable levels of income per capita. Furthermore, because the United States exercises discretion by excluding certain products from certain countries (that are both otherwise part of the program) from being GSP eligible, the United States offers Brazil, India, Indonesia, Thailand, Turkey, and Ukraine slightly fewer tariff preferences than other GSP-eligible countries.

Importantly, there are also major trading partners to which the United States offered no special tariffs in 2014. These include three of the top five sources for its imports—China, the EU, and Japan. Collectively, these three economies alone accounted for over 43% of total US goods imports; by itself, this explains why such a large share of US trade continues to arrive under MFN tariffs. This may partially explain why countries were seeking comprehensive new free trade agreements with the United States in 2014 via the Trans-Pacific Partnership (TPP) negotiations (which includes Japan, as well as Vietnam) and the Transatlantic Trade and Investment Partnership (TTIP) negotiations with the European Union. Other major countries to which the United States did not offer preferences in 2014 include Argentina, Russia and Saudi Arabia. Argentina and Russia had previously been part of the US GSP program for a number of years; both were recently removed from eligibility. Finally, the United States not only did not offer Burma and Iran any bilateral tariff preferences in 2014, they were not even granted the US's applied MFN tariff rate (despite Burma being a WTO member); the United States had an import ban from both countries in effect in 2014.

Before concluding our discussion of preferential tariffs, we make two additional points regarding US tariff preferences that we are not able to capture in the data utilized here.

First, our description of US tariff preferences has focused exclusively on the supply (offerings) side. Even our data on bilateral tariff offerings are incomplete as they exclude reference to the fact that the United States also imposes upper limits (quantitative restrictions) on how much can be imported under some of these unilateral preferences. The focus on bilateral tariff offerings also does not assess the equilibrium take-up of preferences, as it does not consider demand-side factors. For example, preference utilization rates describe the equilibrium outcome whereby exporters actually claim the preferential tariff rate on the customs declaration form, in lieu of simply continuing to pay the (potentially higher) applied MFN tariff.[as]

Finally, like other areas of trade policy, there is additional variation to US tariff preference offerings *over time* as well as across trading partners and products, especially associated with the preferences that arise under the discretionary unilateral programs. The list of products for which the US offers preferences can change from year to year; furthermore, as we have seen from Fig. 9, certain GSP-eligible exporting countries may have their particular export products *excluded* from GSP in a given year that are otherwise GSP eligible. Trading partners can also "graduate" from a given GSP scheme over time, especially after exceeding certain income-per-capita thresholds. For example, the US graduated Bulgaria and Romania from its GSP program in 2007 (upon their accession to the European Union) and Russia in 2014. Finally, countries can also be kicked out of GSP for political reasons. For example, the United States removed Argentina from its GSP program beginning in 2012 due to Argentina's failure to pay roughly $300 million in damages since 2005–06 that it owed US investors arising under a foreign direct investment dispute (USTR, 2012). Overall, there should appear to be much more trade policy uncertainty associated with a US tariff preference arising under GSP than a US tariff preference arising under one of its free trade agreements.

2.4 Other Import Tariffs Beyond MFN and Bilateral Tariff Preferences

Before moving on to other trade policy instruments, we conclude this section with three other examples of ad valorem tariffs that are not captured by the data on either applied MFN tariffs or the bilateral tariffs arising under preferential trading arrangements. We use the example of the United States' trade policy to explain how each example can and has arisen.

First, consider a trading partner that is both not a member of the WTO (so it is not guaranteed an MFN tariff) and is also not part of any preferential trading agreement. For such exporting countries, the United States has a special category in its tariff schedule

[as] Under the US GSP program, quantitative restrictions are referred to as competitive needs limits (CNLs), see Blanchard and Hakobyan (2015) for an analysis. Hakobyan (2015) provides a study of the utilization rates for preferences under the US GSP program. Keck and Lendle (2014) analyze preference utilization rates in a cross-country study involving the United States, EU, Canada and Australia.

referred to as "Column 2" tariffs. These applied tariffs are typically much higher than the MFN rates. In 2014, the US imposed these tariffs on imports from North Korea and also from Cuba (despite Cuba being a WTO member country).

Second, there are instances under both the WTO and some preferential trading arrangements in which countries can be authorized to legally impose (higher) retaliatory tariffs after the adjudication of a formal dispute if the defendant country refuses to comply with a ruling. In these instances, the complaining country in a dispute can be granted the right to raise its bilateral tariff (on imports arising from the defendant country) to some level that is higher than the MFN binding rate. Indeed, the United States has implemented WTO-authorized retaliatory tariffs of 100% on imports from the European Union in the wake of disputes involving bananas and hormone-treated beef; in some instances, retaliatory tariffs have remained in place for years. Mexico, the EU, and other countries have similarly been authorized to raise tariffs on imports from the United States after disputes.[at]

Third, in some instances the applied bilateral ad valorem import tariff is irrelevant because there is an imposed import ban in effect; ie, a quota, or a quantitative restriction sets imports equal to zero. For example, the United States had a ban on imports from Burma and from Iran in 2014.

Overall, while these examples focus on the United States, these sorts of additional considerations can affect any country's applied level of tariff protection, and they have the potential to introduce additional variation to measures of import protection—even beyond those already captured by the tariff policies described in the preceding sections—across sectors, trading partners, and time.

3. BORDER POLICIES BEYOND IMPORT TARIFFS

This section looks past import tariffs to introduce other commercial policies that affect imports at the border. These include the temporary trade barrier policies of antidumping, countervailing duties and safeguards; quantitative restrictions, quotas, and tariff-rate quotas; negotiated arrangements with exporters such as price undertakings and voluntary export restraints (VERs); the allocation of import licences, and the valuation of customs transactions. We briefly describe the contemporary landscape of each policy individually, though one theme that will emerge from our discussion of the empirical research on the determinants of these policies is the substitutability of these instruments with the applied import tariffs described in Section 2, as well as with each other.

[at] See, for example, the collection of research in Bown and Pauwelyn (2010) regarding the retaliation in WTO disputes arising between 1995 and 2008. For a broader introduction to WTO dispute settlement, see Mavroidis (2016).

For some of the policies, the existing data sources are comprehensive and rich; this allows us to address empirically some of our chapter's main questions. For the temporary trade barrier policies, we examine cross-country differences in the import coverage of these barriers. Within countries, we examine sectoral differences in import protection under these policies and compare sectors with temporary trade barriers to those with high applied tariffs. Furthermore, the levels of these barriers change considerably over time. Finally, they exhibit significant discrimination across trading partners.

Before turning to a description of the policies, we note that, collectively, these nontariff border policies have been the focus of seminal empirical studies of theories of trade policy determination. Indeed, the modern literature on endogenous import protection focused on these nontariff policies because the *negotiated* (MFN) import tariffs (described in Section 2) that the major GATT/WTO members applied were inappropriate for studies of optimal, unconstrained policymaking behavior. Many of the policy instruments described next (and perhaps some from Section 5) are important components of the measures of "trade policy"—frequently defined as sector-level coverage ratios—used in Trefler (1993), Goldberg and Maggi (1999), and Gawande and Bandyopadhyay (2000).[au]

3.1 Temporary Trade Barriers of Antidumping, Countervailing Duties, and Safeguards

The first set of trade policy instruments that we consider are antidumping, countervailing duties, and safeguards. These are collectively referred to as temporary trade barriers (TTBs) based on the common property that legally each has a temporary life span. Later we assess both their collective use—motivated by evidence of how they have been used as substitute policy instruments—and we also disentangle their individual use in order to show their relative importance, since the GATT/WTO does impose distinct legal conditions under which use of each can be permitted. While all three require evidence of injury to the domestic, import-competing industry, antidumping also requires evidence that this was caused by low-priced (dumped) imports, countervailing duties require evidence that this was caused by foreign-government subsidized imports, and safeguards require evidence that injury was caused by an unexpected import surge.[av] Overall, according to metrics such as frequency of use and import coverage, the most empirically important of the policies is antidumping. Nevertheless, safeguards use has been important for certain countries and especially during certain periods, and there is also some evidence that countervailing duty use may be increasing for some countries over time.

[au] More recent research has utilized these data for other purposes, including studies such as Broda et al. (2008) and Blanchard et al. (2016), so as to validate their primary results (that focus on determinants of applied tariffs) with empirical analysis of other border barriers.

[av] For a comprehensive survey of economics research on antidumping, see Blonigen and Prusa (2016); on countervailing duties and subsidies, see Lee (2016); and on safeguards, see Beshkar and Bond (2016).

The data on TTBs is sufficiently comprehensive—at least relative to the other border policies we examine in Section 3—that we are also able to present measures that illustrate policy variation and thus which can address some of our chapter's main questions.[aw]

Table 5 summarizes TTB use by our 31 economies over 1995–2013. It also includes information on when the economy implemented its antidumping law, and when it initiated its first antidumping investigation. We choose the 1995–2013 period for a number of reasons. First, it is a period that our data most accurately captures the "stock" of TTB policies in effect.[ax] Second, 1995 initiated common rules for TTB use for all WTO members.[ay] Third, by 1995 we observe a common external trade policy for customs union partners such as EU–Turkey and Argentina–Brazil and thus can more easily examine potential differences in TTB use between partners.

For interpretive purposes, consider the import coverage of the TTBs that the United States had in effect over 1995–2013. The first four columns of Table 5 reveal information on the cumulative share of imported products over which the United States imposed some sort of TTB policy during the period. The United States imposed some TTB policy on 10.6% of all HS06 imported products at some point during 1995–2013. Among the four different TTB policies in use by the United States during this period, antidumping has been most prevalently applied (covering 9.0% of all products), followed by countervailing duties (5.1%), the global safeguard (2.8%), and the China-specific transitional safeguard (less than 0.1%). The fact that individual TTB policies for the US aggregate to more than 10.6% of total imports reflects both the *substitutability* of these policy instruments—eg, the United States has applied different TTB policies to the same products at different points in time—as well as the *redundancy* of these policy instruments—eg, the United States frequently applies two different TTB policies, such as an antidumping duty and a countervailing duty, to the

[aw] The empirical analysis in this section updates and extends much of the information initially presented in Bown (2011b), which also provides more detail on the underlying methodology, using more recent data from the World Bank's Temporary Trade Barriers Database (Bown, 2014a). Additional detail on the database is provided in Data Appendix. Our analysis below is not comprehensive, however, and there are at least three other important aspects of TTB use that we mention briefly here. First, and as we describe elsewhere in this chapter, these policies are applied not only as ad valorem duties, but also frequently as specific duties, price undertakings, quotas, and tariff rate quotas. Second, our import coverage ratio measures do not address potentially significant variation in the restrictiveness of the policies; here we only note that even when these policies are imposed as ad valorem import duties, they are sometimes set at prohibitive levels of greater than 100%, 500%, or 800%. Third, while the "stock" measures introduced later are affected by the duration of the imposed policy—recall that WTO rules for each of them are that they are supposed to be "temporary" (ie, duration of less than 3–5 years)—there are numerous examples of duties covering some products that have been imposed for 20–30 years or longer. The data required to explore each of these points empirically is readily available in Bown (2014a).

[ax] For the United States and EU especially, the early 1990s featured antidumping duties still in effect from the 1980s and earlier but for which we do not have the HS codes because they were imposed under different product classification schemes.

[ay] Under the GATT, the rules for certain TTBs were different depending on whether a GATT member was a signatory to the plurilateral Antidumping Code and Subsidies Code.

Table 5 Import product coverage by temporary trade barriers over 1995–2013, by country and policy

		Cumulative coverage by TTB ever in effect during 1995–2013					Annual coverage by TTB in effect 1995–2013				Annual coverage by new TTB investigation 1995–2013			
	AD law/ initiation	All TTBs	AD only	CVD only	SG only	CSG only	Mean	St. Dev.	Min.	Max.	Mean	St. Dev.	Min.	Max.
G20 High income														
Australia	1906/na	2.5	2.5	0.5	0.0	0.0	0.8	0.2	0.4	1.2	0.2	0.1	0.1	0.4
Canada	1904/na	3.4	3.4	1.5	0.0	0.0	1.6	0.3	1.2	2.2	0.3	0.3	0.0	1.1
European Union	1968/1968–69	8.1	6.6	1.4	1.6	0.0	2.8	0.5	2.1	3.6	0.6	0.5	0.1	2.2
Japan	1920/1982	0.3	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.2	0.0	0.0	0.0	0.1
Korea	1963/1986	1.6	1.4	0.0	0.1	0.0	0.6	0.2	0.2	0.8	0.1	0.2	0.0	0.6
Saudi Arabia	na/na	na	na	na	na	na	na	na	na	na	na	na	na	na
United States	1916/1922	10.3	9.0	5.1	2.8	0.0	4.9	1.1	3.3	6.8	0.9	0.8	0.1	3.9
G20 Emerging														
Argentina	1972/na	4.8	4.6	0.1	0.5	0.0	2.2	0.6	1.2	3.2	0.5	0.4	0.0	1.3
Brazil	1987/1988	2.8	2.4	0.2	0.3	0.0	1.2	0.4	0.4	1.9	0.3	0.2	0.0	0.6
China	1997/1997	3.1	2.1	0.2	1.3	0.0	1.1	0.7	0.0	2.0	0.2	0.4	0.0	1.8
India	1985/1992	8.0	7.6	0.0	0.9	0.3	3.4	2.2	0.2	6.6	0.9	0.7	0.1	2.4
Indonesia	1995/1996	2.1	1.1	0.0	1.1	0.0	0.6	0.6	0.0	1.8	0.2	0.3	0.0	1.2
Mexico	1986/1987	22.9	22.8	0.6	0.0	0.0	17.5	10.0	1.0	23.7	0.2	0.1	0.0	0.4
Russia	na/na	na	na	na	na	na	na	na	na	na	na	na	na	na
South Africa	1914/1921	2.1	2.1	0.1	0.0	0.0	1.0	0.4	0.3	1.7	0.1	0.1	0.0	0.6
Turkey	1989/1989	4.2	2.5	0.0	1.6	0.1	2.9	2.0	0.6	5.9	0.4	0.5	0.0	1.8

Continued

Table 5 Import product coverage by temporary trade barriers over 1995–2013, by country and policy—cont'd

		Cumulative coverage by TTB ever in effect during 1995–2013					Annual coverage by TTB in effect 1995–2013				Annual coverage by new TTB investigation 1995–2013			
	AD law/ initiation	All TTBs	AD only	CVD only	SG only	CSG only	Mean	St. Dev.	Min.	Max.	Mean	St. Dev.	Min.	Max.
Developing, other														
Colombia	1990/1991	2.3	1.2	0.0	0.1	1.5	0.6	0.5	0.1	1.9	0.2	0.4	0.0	1.8
Egypt	na/na	na	na	na	3.6	na	na	na	na	na	na	na	na	na
Pakistan	1983/2002	0.4	0.4	0.0	0.0	0.0	0.2	0.1	0.0	0.3	0.1	0.1	0.0	0.3
Philippines	1994/1994	0.5	0.3	0.0	0.2	0.0	0.2	0.1	0.1	0.7	0.1	0.1	0.0	0.4
Thailand	1994/1994	0.6	0.6	0.0	0.1	0.0	0.3	0.2	0.0	0.7	0.4	0.5	0.0	1.0
Ukraine	na/na	na	na	na	0.1	na	na	na	na	na	na	na	na	na

Coverage indicates share of a country's HS06 import product lines, constructed by the authors with data from Bown, C.P., 2014a. Temporary trade barriers database. The World Bank. Available from: http://econ.worldbank.org/ttbd/ (accessed 25.07.14).

Notes: na indicates policy data not available, though the country is a known user of TTBs more generally. TTB, temporary trade barrier; AD, antidumping; CVD, countervailing duty; SG, global safeguard; CSG, China-specific transitional safeguard; and G20, Group of 20. AD law is year of implementation of the country's antidumping regime, and initiation refers to the year of initiation of the country's first antidumping investigation. Data for Bangladesh, Burma, DR of the Congo, Ethiopia, Iran, Kenya, Nigeria, Tanzania, and Vietnam omitted.

same product and trading partner at the same time. The last columns indicate that, on average over 1995–2013, the United States had 4.9% of imported products covered by an imposed TTB in any year, and the maximum coverage was at 6.8% in 2012. Finally, the mean share of imported products in a year that were subject to a new US TTB investigation—and that could potentially lead to new import restrictions—was 0.9%. The maximum share of imports subject to new TTB investigations was 3.9% of products in 2001, when the United States initiated a wide-ranging safeguard investigation over steel.

Is there a pattern to which countries tend to utilize TTBs as import protection? To summarize Table 5, while some countries certainly use TTBs more than others, the overall country-level pattern is not as clear as the import tariffs covered in Section 2.1. First, significant users of TTBs include a mix of high-income (US, EU) and emerging (Argentina, Brazil, China, India, Mexico, and Turkey) economies; many of the emerging economies only began using TTBs in the late 1980s or early 1990s. Second, not all WTO members use TTBs.[az] Most of the poorest developing countries in our sample do not use TTBs, and thus are not listed. While most of the high-income and emerging economies have become users of TTBs over time—albeit at different levels and frequencies—there are some high-income economies which only rarely apply them. For example, Japan is a rare user even though its antidumping law dates to 1920. Furthermore, there are some countries—eg, Australia, Canada, and even South Africa—who were major users of TTBs historically but whose use during 1995–2013 has declined relative to earlier decades. Finally, customs union partner pairs that share a common applied MFN tariff—eg, EU–Turkey, Argentina–Brazil—retain the legal authority to implement their TTB policies independently and clearly do so.

Before moving on to our next question of interest, we pause briefly to note that the composition of antidumping, safeguards and countervailing duties used by different countries is not systematic. While the United States has implemented each of the three major TTB policies with a significant share of import coverage during this period, most of the TTB users tend to rely primarily on antidumping, with a more limited use of safeguards.[ba] Countervailing duty laws, on the other hand, have only recently been adopted by a number

[az] The table lists the data for the users of the policies that are "known" users; users are known even if detailed data on their use is not available from Bown (2014a) due to the WTO's minimum reporting requirements. Countries are listed if they are known users of the policy even if the details of the data on their policy use are not available (na). For an exploratory analysis of why countries adopt antidumping laws, for example, see Vandenbussche and Zanardi (2008).

[ba] Significant users of safeguards in our sample of economies, for example, include Argentina, Brazil, Egypt, the EU, China, India, Indonesia, and Turkey—though for the United States, EU, and China, the significant safeguards use during this period was dominated by the almost simultaneous safeguards imposed over an overlapping set of steel products in 2001–03. For a discussion of the US safeguard on steel, and a comparison to the similarities on prior United States use of antidumping and countervailing duties products during the 1990–2003 period, see Bown (2013b). On the other hand, Blonigen et al. (2013) use the US steel industry to examine the nonequivalent market power effects of quotas and tariffs arising in the industry, some of which arose through TTB policies.

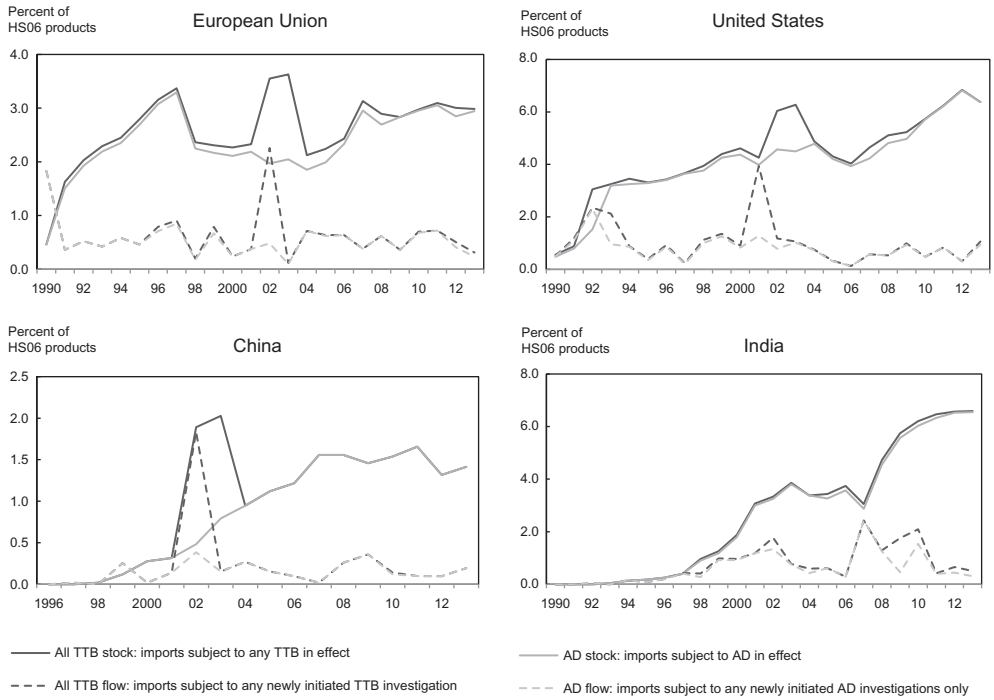

Fig. 10 Import products subject to newly initiated TTB investigations and imposed import restrictions for selected economies, 1990–2013.

Share of HS06 import protects subject to TTBs. Constructed by the authors from temporary trade barrier (TTB) data at the HS-06 level from Bown, C.P., 2014a. Temporary trade barriers database. The World Bank. Available from: http://econ.worldbank.org/ttbd/ (accessed 25.07.14); TTBs include antidumping, countervailing duties, global safeguards, and China-specific transitional safeguards.

of economies and are only starting to be implemented; as such, their import coverage has been fairly limited to high-income economies including the United States, EU and Canada. The China-specific transitional safeguard mechanism that was introduced as part of China's WTO Accession Protocol in 2001 has not been frequently utilized.[bb]

Next, do countries make significant changes to the levels of their TTB import protection over time? Fig. 10 presents a measure of the time path of TTB use for the EU, the United States, China and India over a slightly longer time period of 1990–2013. The figure plots four series of data—for all TTB policies (and antidumping only), a "flow" measure of the share of HS06 import products each year subject to a newly-initiated TTB investigation that could result in a new import restriction; and for all TTB policies

[bb] Notwithstanding the somewhat infamous use of this policy by the United States on imports of tires in 2009, the peak use was by Colombia, briefly, over a set of textile and apparel products in 2005. For a discussion of the United States safeguard on tires, see Charnovitz and Hoekman (2013). For the China safeguard more broadly, see Bown (2010) and Bown and Crowley (2010).

(and antidumping only), a "stock" measure of the share of HS06 import products each year subject to an imposed import restriction.

Fig. 10 illustrates interesting features on the use of these TTBs over time. First, there are spikes for the United States in 1992 and 2001 and for the EU in 2001; empirical evidence described in more detail later links significant increases in TTB use to recessionary periods (especially unemployment rate increases) as well as real exchange rate appreciations. Second, India began using TTBs in 1992 and China in 1997; import coverage levels for India exhibit a consistently upward trend. Third, for China, the EU, and the United States, the significant deviation in 2001–03 between the "all TTB" series and "antidumping only" series reflects the previously discussed global safeguards that each applied over steel products. Fourth, there is a slight increase for these economies in the "flow" of products subject to new TTB investigations during the Great Recession period of 2008–09, but it is not nearly as sizeable as in other periods of macroeconomic downturn.

To what extent has research linked changes in TTB levels to macroeconomic shocks such as real exchange rate appreciations and increases in the unemployment rate? Furthermore, can this partially explain why applied MFN tariffs were not responsive to the massive aggregate-level fluctuations taking place during the Great Recession, as discussed in Section 2.1? Knetter and Prusa (2003) and Irwin (2005) provide evidence from data through the 1990s that exchange rate appreciation significantly impacts antidumping use for a number of high-income economies. More recently, Bown and Crowley (2014) and Limão (2006) confirm these results in the more comprehensive TTB data in cross-country samples of five high-income economies and 13 emerging economies, respectively, covering the period of 1988–10. They find for the EU and the United States, the flexibility of the real exchange rate, and in particular the sharp depreciations that subsequently took place (after initial sharp appreciations in 2009) likely contributed to the dampening pressure on demands for import protection during the Great Recession. Second, over time, the emerging economies' collective TTB responsiveness to macroeconomic shocks (including also changes in the unemployment rate and real GDP growth) has been increasing, and thus mimicking the TTB counter-cyclical responsiveness of high-income economies. Finally, there is some evidence from emerging economies that as the tariff binding overhang diminishes over time, countries substitute away from adjusting their MFN applied tariffs and toward implementing TTBs.

The next of our major questions is whether, when countries apply import protection via TTBs, they do so differentially across sectors. Fig. 11 illustrates the breakdown for the major TTB users and presents clear evidence of significant variation across industries.[bc]

[bc] In particular, we provide figures for countries for which 2.8% or more of their HS06 lines were subject to a TTB during this period. We also group countries somewhat differently so as to make more direct comparisons between certain pairings that might be expected to have common determinants of policy, including those arising for institutional reasons under an FTA or customs union.

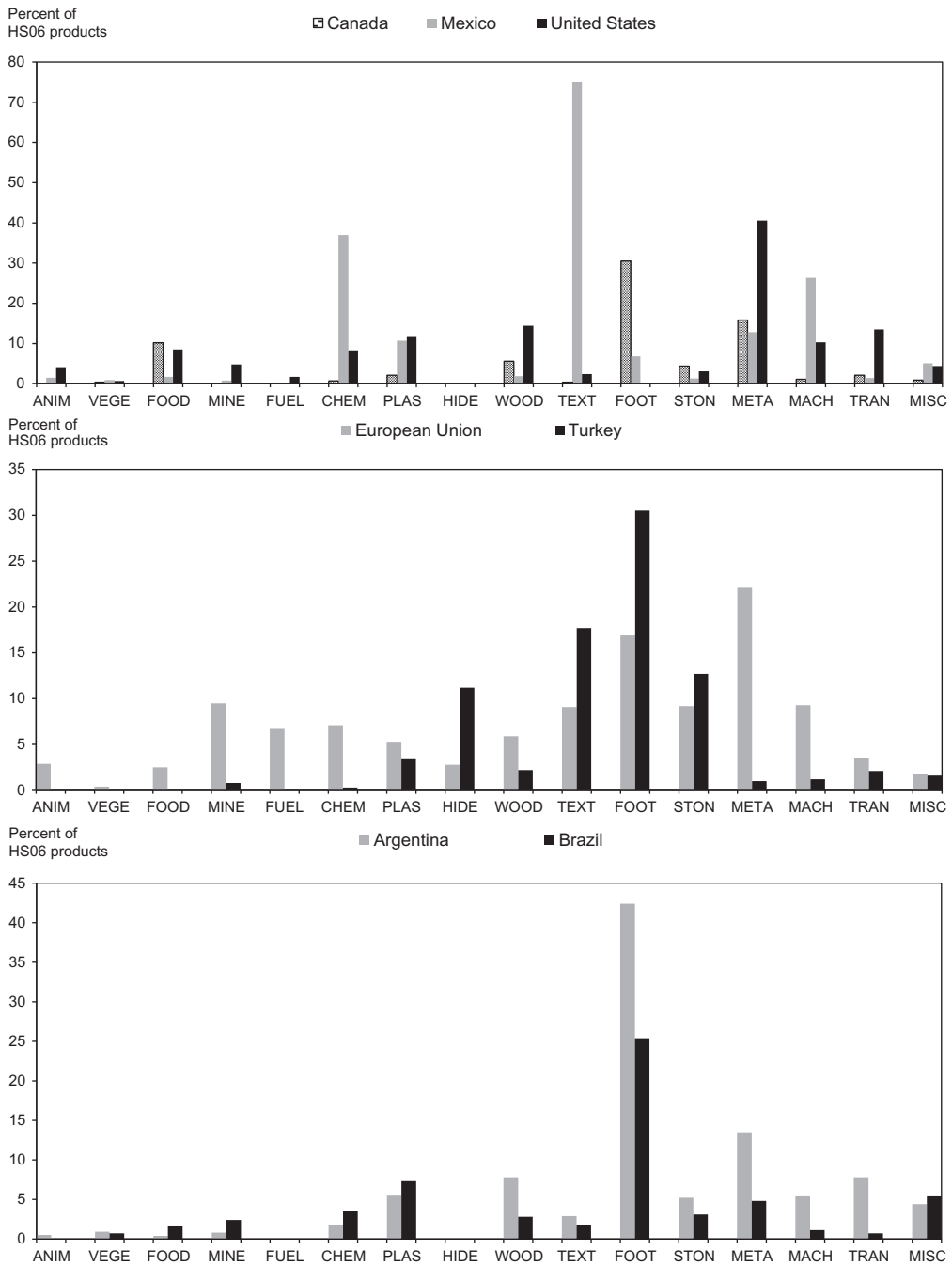

Fig. 11 Import products with an imposed temporary trade barrier in effect over 1995–2013, by policy-imposing economy and industry.

Constructed by the authors from temporary trade barrier (TTB) data at the HS-06 level from Bown, C.P., 2014a. Temporary trade barriers database. The World Bank. Available from: http://econ.worldbank.org/ttbd/ (accessed 25.07.14); TTBs include antidumping, countervailing duties, global safeguards, and China-specific transitional safeguards. Notes*: during this period Canada, Mexico, and the United States had a common FTA (NAFTA), European Union and Turkey had a customs union (common external applied MFN tariff), and Argentina and Brazil had a customs union (common external applied MFN tariff).*

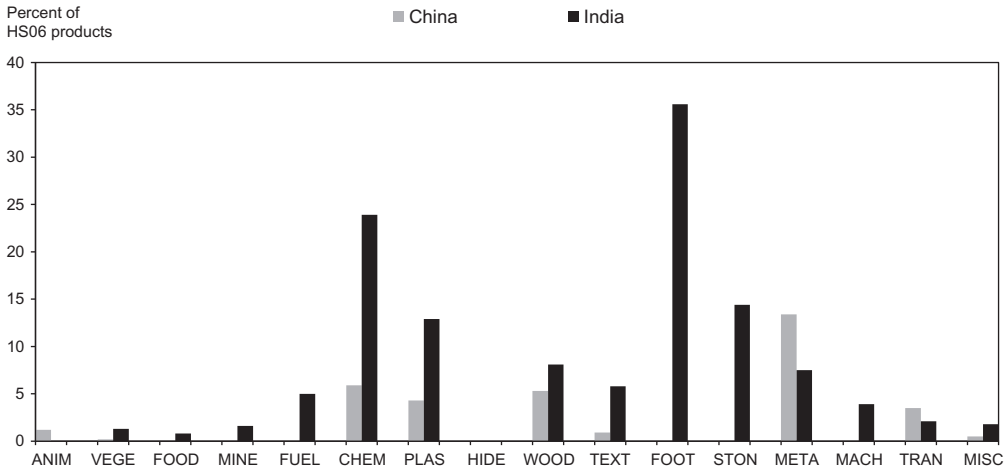

Fig. 11—Cont'd

Furthermore, do countries apply TTBs in the same sectors in which they have high tariffs? A comparison of Fig. 11 with Figs. 2, 3, and 7, suggests no clear pattern as to whether TTBs were more or less likely to arise in the sectors that were still subject to high average tariffs, high incidence of tariff peaks, or high frequency of specific duties. For example, agriculture during 1995–2013 was not a frequent target of TTBs across using countries. For other sectors, such as textiles and apparel and footwear, there is more variation across countries. The United States has relatively high MFN applied tariffs in those sectors and has not used TTBs. On the other hand, Argentina, Brazil, India, Mexico and Turkey had these sectors protected by relatively high MFN applied tariffs and a relatively high import coverage by TTBs. One rationale for these countries, as we describe next, is frequently to address increased import competition in these sectors from other emerging economies, especially China (Bown, 2013a). Finally, chemicals and metals are relatively low tariff sectors but high TTB sectors, especially in high-income economies. This is consistent with use in earlier decades as we further detail later in Section 4. Contributing explanations include that these are high fixed cost, concentrated industries; this may affect an industry's ability to organize politically and file petitions for TTB protection under these laws.

Here, we briefly point to two recent approaches that researchers have used to explain elements of the cross-sectional variation in TTB use within countries. First, Bown and Crowley (2013b) examine US TTB use at the industry-trading partner level over 1997–2006 in order to assess whether import protection responds to terms-of-trade

pressure, in the spirit of the repeated game model of Bagwell and Staiger (1990). Because US applied MFN tariffs are constrained due to WTO tariff bindings, the Bown–Crowley approach can be interpreted as providing evidence consistent with the terms-of-trade theory that levels of import protection increase in the face of trade volume surges, especially in sectors with import demand and export supply that are relatively inelastic. Second, Bown and Tovar (2011) examine India's applied TTBs and the Grossman and Helpman (1994) model of endogenous trade policy formulation. Their empirical results are consistent with the Grossman–Helpman theory when using India's applied MFN tariffs in 1990, inconsistent with the theory for applied MFN tariffs *only* in 2000–02, but consistent again with the theory when using India's TTBs *in addition to* the applied MFN tariffs in 2000–02. This evidence suggests that, over time, India unwound some of its applied tariff reductions by substituting toward antidumping and safeguard policies.

The last of our thematic questions is whether, when countries apply import protection through TTBs, their applied policies discriminate among different trading partners. While there are different ways to examine this issue, Table 6 presents two measures—the trade-weighted share of the exporting country's total exports to the G20 economies over which the G20 economy had a TTB imposed, and the estimated value of those TTB-impacted exports to the G20 economy.[bd] We compute these two measures both in 2013 for the G20 economies and then, for rough comparison purposes, also in 1995 for the "G4" economies of Australia, Canada, the EU and the United States— the major TTB users at the time.

To interpret Table 6, consider an exporter like China. In 2013, 7.1% of China's exports to the G20 economies were subject to a TTB, and this is estimated to cover roughly $100 billion of its exports to those economies. In 1995, only 2.9% of China's exports to the G4 economies were subject to a TTB, and this was estimated to cover only $3.3 billion (in constant 2013 dollars) of its exports to those four economies.

Table 6 thus clearly reveals that TTBs are not applied uniformly across exporters. First is the sheer scale with which the value of China's exports were subject to G20 TTBs in 2013 relative to all other exporting countries—in value terms, China has almost 10 times more TTB-affected exports than the second most-impacted exporter, Korea, which had roughly $14 billion of affected exports. The United States comes in third at $12.6

[bd] These data are derived from dynamic import coverage ratios following the methodology described and applied in Bown (2011b, 2013a). The main requirement is an assumption on counterfactual import growth for products from trading partners subject to an imposed TTB during the period that the TTB was in effect. The current data relies on the relatively conservative assumption that TTB-impacted products would have grown at the average rate of import growth for non-TTB impacted products.

Table 6 Exporting countries most exposed to foreign-imposed TTBs, 2013 and 1995

	Exporter	TTB-affected share of 2013 exports to G20 (%)		Exporter	TTB-affected value of 2013 exports to G20 (billions of 2013 dollars)		Exporter	TTB-affected share of 1995 exports to G4 (%)		Exporter	TTB-affected value of 1995 exports to G4 (billions of 2013 dollars)
1.	Latvia	17.7	1.	China	100.3	1.	Korea	7.6	1.	Japan	7.7
2.	China	7.1	2.	Korea	14.0	2.	Venezuela	6.2	2.	Korea	4.6
3.	Ukraine	5.7	3.	United States	12.6	3.	Ukraine	5.7	3.	China	3.3
4.	Kuwait	5.1	4.	Japan	4.4	4.	Lithuania	4.4	4.	United States	1.8
5.	Korea	3.9	5.	India	3.5	5.	China	2.9	5.	Thailand	0.9
6.	Argentina	3.8	6.	Thailand	3.5	6.	Thailand	2.8	6.	Brazil	0.7
7.	Moldova	3.7	7.	Indonesia	2.9	7.	Japan	2.6	7.	Malaysia	0.6
8.	Indonesia	3.1	8.	Russia	2.5	8.	Brazil	2.2	8.	Canada	0.6
9.	India	2.7	9.	Mexico	2.5	9.	Turkey	1.9	9.	Hong Kong	0.5
10.	Russia	2.3	10.	Germany	2.5	10.	Russia	1.8	10.	Germany	0.5
11.	Slovenia	2.3	11.	Argentina	1.9	11.	Egypt	1.6	11.	Russia	0.4
12.	Thailand	2.3	12.	Ukraine	1.7	12.	Hong Kong	1.5	12.	Turkey	0.4
13.	Macedonia	2.1	13.	Malaysia	1.6	13.	Malaysia	1.4	13.	Singapore	0.4
14.	Trin. and Tobago	2.1	14.	Vietnam	1.3	14.	Saudi Arabia	0.9	14.	Netherlands	0.2
15.	U.A.E.	1.6	15.	Brazil	0.8	15.	Poland	0.8	15.	United Kingdom	0.2
16.	Oman	1.6	16.	Italy	0.8	16.	Singapore	0.8	16.	Italy	0.2
17.	Poland	1.6	17.	Canada	0.6	17.	Australia	0.5	17.	Venezuela	0.2
18.	Kenya	1.5	18.	U.A.E.	0.6	18.	United States	0.5	18.	Poland	0.2
19.	Vietnam	1.3	19.	France	0.6	19.	Argentina	0.5	19.	France	0.2
20.	United States	1.3	20.	Singapore	0.5	20.	South Africa	0.5	20.	Ukraine	0.2

Trade-weighted shares of imports subject to foreign-imposed TTBs, constructed by the authors using HS-06 level data from Bown, C.P., 2014a. Temporary trade barriers database. The World Bank. Available from: http://econ.worldbank.org/ttbd/ (accessed 25.07.14) matched to UN Comtrade import data and using the methodological approach of Bown (2011b, 2013a). G20 = Group of 20 economies listed in Table 1. G4 = Australia, Canada, European Union, and United States only.

billion.[be] Furthermore, a number of other emerging, developing, and "transition" economies also have a substantial share of their exports affected by foreign-imposed TTBs. While not shown here, some of this can be tied to the fact that some of the major new users of TTB policies are other emerging economies, thus revealing TTBs as an instrument through which "South–South" protectionism is arising (Bown, 2013a). Third, China, Ukraine, Moldova, Russia and Macedonia are all former "nonmarket" economies (NMEs); there are special rules available for countries to impose antidumping in particular against NMEs during this period which may make it arguably easier legally to apply such import restrictions to them.

Can the main export targets of TTB use change over time? In 1995 the main TTB policy in use (antidumping) was primarily targeting the newly industrializing Asian economies of Japan and Korea. Indeed, Japan went from having $7.7 billion of exports to the G4 in 1995 being subject to TTBs (roughly 2.6% of its total exports to those economies), to only $4.4 billion in 2013, and it is now not even among the top 20 targeted countries as a share of the country's total exports. And while Korea was still the second largest exporter in 2013 when calculated in value terms, the share of its exports subject to TTBs in these two sets of important markets is only roughly half as large in 2013 as it was in 1995. This anecdotal evidence for Japan and Korea at least suggests that highly-impacted exporters—including China today—may be able to "graduate" from being targets of foreign TTB use over time.

3.2 Quantitative Restrictions, Import Quotas, and Tariff Rate Quotas

Import quotas—defined as a limit on the number of units of a product that may enter a country—are generally forbidden under the original GATT through Article XI. A long line of economic research has shown that the administration of a quota affects the allocation of welfare and the costs that the quota imposes on different societal groups. If a domestic government auctions off licenses to import the good, then the difference between the item's price under free trade and the domestic price of the good under the quota is a "quota rent" which is collected by the importing country's government. If the government gives away licenses to import under the quota, it transfers the value of this potential (auctioned license) revenue to whomever receives the licenses—a foreign government, a foreign export licensing board, or foreign producers. In this process, there is great scope for corruption; concern regarding corruption is one of the reasons why ad valorem tariff policies have long been encouraged as the "preferred" form of border

[be] While Latvia had a larger share of its exports subject to G20-imposed TTBs than China in 2013, because it is such a small exporting country, when measured in dollar terms it was not in the top 20 most affected exporters.

barrier.[bf] While the inherent assumption in the preceding examples was that the world market price was below the domestic price, so that the entire quota was filled, in practice, nonbinding quotas with unfilled allotments are not uncommon. In these cases, the quota fill rate, the ratio of actual imports to quota-allowed imports, can serve as a measure of the restrictiveness of the policy.

Countries today continue to apply quantitative restrictions on imports in a few different areas under the WTO system.

First, a number of countries continue to maintain quantitative restrictions in their agricultural sector. Some countries have articulated—as part of their legal commitment to the WTO—a minimum volume of imports of a product for which they offer one (lower) tariff rate; any additional imports arising beyond that minimum volume face a higher tariff rate. These are referred to as tariff rate quotas (TRQs). Take, for example, the United States, which continues to maintain a TRQ for sugar with an in-quota specific duty of 0.625 cents per pound and out-of-quota specific duty of over 20 times that—ie, of 15.36 (raw sugar) or 16.21 (refined sugar) cents per pound. Overall, in the United States in 2013, 4.5% of agricultural products remained subject to quantitative restrictions (through tariff rate quotas). TRQs are also prominent in agriculture in a number of other high-income economies: for the EU, 11.3% of agricultural products were still subject to TRQs, in Canada 9.5%, and in Japan 6.2% (WTO, 2014).

Second, quantitative restrictions remain an especially prevalent outcome in safeguard investigations, including many imposed by emerging and developing countries. Overall, 30% of the import restrictions that WTO members imposed under the Agreement on Safeguards between 1995 and 2014 involved quotas.

Do countries impose quotas so as to discriminate among trading partners? Indeed, the administration of quotas frequently allocates the import licenses under an historical market share rule; typically a firm or country's average market share over the prior 3 years.[bg] Bown and McCulloch (2003) examine the WTO safeguards imposed over 1995–2000

[bf] More generally, the empirical relevance of the distinction between tariffs and quotas depends on the production technology in an industry and its market structure. Since Bhagwati (1965), economists have understood the general equivalence of tariffs and quotas in perfectly competitive markets with a competitive allocation of quota rights. Interestingly, since its inception in 1947, the GATT/WTO system has pushed for members to adopt tariffs rather than quotas. Important theoretical differences between tariffs and quotas have focused on deviations from the assumption of perfect competition (Panagariya, 1981, 1982) or wasteful resources devoted to gaining import licenses (Krueger, 1974).

[bg] In particular, a quota might allocate a value-based measure of domestic market share to all foreign producers—eg, 50%—and then further divide the aggregate quota to historical exporters based on historical market shares. This system has the advantage of dramatically reducing competitive pressure on domestic producers, partially placating major foreign producers, while facing minimal resistance from the major losers, ie, disorganized consumers and potential new entrants from foreign countries. This system nominally satisfies nondiscrimination by providing market access to historical exporters, but prevents new market entrants that have the potential to put downward pressure on consumer prices.

and highlight the discriminatory nature of quota allocations. For example, quantitative restrictions which base within-quota shares on historical market presence discriminate against new entrants.

Finally, the most significant quota system of the last half-century, the multifiber arrangement (MFA)— that we address in Section 4—was dismantled in 2004. A number of studies have focused on different aspects of the MFA (Brambilla et al., 2010; Harrigan and Barrows, 2009; Dean, 1995; Khandelwal et al., 2013), and especially the implications of its expiration.

3.3 Price Undertakings and Voluntary Export Restraints

A second form of quantitative restriction is a voluntary agreement by exporters to raise their prices and/or restrain their export volumes. These policies are referred to as price undertakings or voluntary export restraints (VERs), and while they share many common economic features; they are currently treated in different ways under the WTO. For while VERs were supposedly banned in the Agreement on Safeguards established in 1995, price undertakings are encouraged as an outcome in the 1995 WTO Agreement on Antidumping.[bh]

Not surprisingly, given the high frequency of antidumping use across countries, price undertakings are also a relatively common outcome of the investigations. Consider, for example, the data on antidumping outcomes for the European Union. Overall, approximately 20% of EU antidumping investigations that found evidence of dumping by foreign exporters over 1989–2011 resulted in a negotiated price undertaking. These arrangements typically consist of a minimum import price and a market share allotment.[bi] Thus, the impact of an undertaking, like that of a quota, will depend on the competitive structure of the industry with considerable scope for losses to consumers if the market is imperfectly competitive.

Table 7 summarizes the EU's application of different *forms* of import barriers arising as the outcomes of antidumping investigations over 1989–2011. Each entry is the percent of total antidumping measures, by export origin, implemented in the form listed.[bj] The EU imposed almost two thirds of antidumping measures as ad valorem duties and roughly 10% as specific duties; as noted earlier, these specific duties can also discriminate between trading partners and in particular against those producing lower-priced varieties.

[bh] Bown (2002b) presents a discussion. As we further describe later in Section 4, one of the political motivations for the attempts to ban VERs was that they had become a common outcome to US safeguard and antidumping investigations in the 1970s through early 1990s, especially with respect to bilateral frictions that the United States had at the time with Japan (Bown and McCulloch, 2009).

[bi] However, these are nontransparent in that official EU publications do not report the negotiated prices or market shares. Rather, official *Decisions* and *Regulations* report the names of the lead foreign negotiating authority (for example, a foreign Chamber of Commerce or industry association) and all firms that are participating in the undertaking. This set-up leaves the Commission with flexibility to adjust minimum import prices and market shares as the situation warrants.

[bj] During this period, according to the Temporary Trade Barriers Database, the EU implemented a total of 492 antidumping measures. In roughly 5% of cases, the form of the final antidumping measure is unknown.

Table 7 European Union border barriers resulting from imposed antidumping, 1989–2011

	Export Origin			
	All countries	**G20 high income**	**G20 emerging**	**Developing**
Tariffs				
Ad valorem duty	65.0	75.3	68.2	56.5
Specific duty	9.6	9.6	12.0	6.2
Price undertakings				
Price undertaking	13.2	6.8	6.6	24.9
Price undertaking/Ad val. duty	4.9	2.7	2.5	9.6
Duty if min. price breached	2.2	4.1	2.5	1.1
Other (outcome unknown)	5.1	1.5	8.2	1.7

Constructed by the authors with data from Bown, C.P., 2014a. Temporary trade barriers database. The World Bank. Available from: http://econ.worldbank.org/ttbd/ (accessed 25.07.14). Entries are share of imposed border restrictions resulting in that type of imposed border barrier.

Next consider the breakdown of the form of antidumping measures by export origin. Broadly, the EU tends to favor ad valorem import tariffs to restrict imports from high-income and emerging economies. In contrast, the EU negotiates a price undertaking in roughly 35% of the instances in which it imposes an antidumping measure against a developing country. This result could be another means to discriminate between trading partners (against new entrants). On the other hand, price undertakings may actually be preferred by the exporters if the alternative is an EU antidumping import tariff because, with a price undertaking, at least the exporter receives any "quota rents" associated with the restriction.

Two final examples illustrate the continued economic relevance of these "voluntary" policies. Consider first the price undertaking that the EU negotiated with China regarding imports of solar panels. At the time, this was an important trade policy event from China's perspective as solar panels comprised 7% of *total* Chinese exports to the EU in 2012.[bk] Second, while VERs are not commonly in current use, they were used in a major industry as recently as 2008. Upon the expiration of the MFA in 2005, the United

[bk] Interestingly, the cumulative abnormal return of Chinese solar panel producers to the European Commission's decision to institute a price undertaking was, on average, negative (Crowley and Song, 2015). Although a quota could, in theory, improve profitability of exporters by facilitating collusive price increases, it seems that for Chinese solar panel producers, the loss of future sales growth in Europe more than offset any gains associated with the elimination of aggressive price competition insured by the undertaking's minimum import price. This is in sharp contrast to the investor response to the announcement of the 1981 US automobile voluntary export restraint. The announcement of that VER, which gave the right to issue export licenses to the United States to Japanese authorities, sent the stock prices of Japanese automobile producers up (Ries, 1993), a phenomenon that demonstrated how import quotas facilitate collusive behavior in an oligopolistic market (Harris, 1985; Krishna, 1989). By establishing the restriction as a count of units rather than as a market share, the US government also provided an incentive for Japanese exporters to improve quality and increase price-cost markups (Berry et al., 1999; Goldberg, 1995; Feenstra, 1988).

States and EU quickly negotiated a set of VERs for China's exports of textiles and apparel to their markets for the period covering 2005–08.[bl]

3.4 Import Licensing, Customs Valuation, and Trade Facilitation

The final two border "policies" that we introduce include additional ways that governments can manipulate administrative hurdles to impact trade. A government may impose additional requirements that traders have official import licences in order to sell goods in its market, and then impose barriers to the acquisition of such licences. Furthermore, while the GATT and WTO contain substantial legal provisions instructing authorities on how to evaluate merchandise for assessment of duties, governments may also deliberately distort customs valuation procedures to restrict trade.

While we are unaware of any comprehensive attempts to catalogue import licensing requirements or variation in customs valuation procedures, thus making it difficult to assess their more general impact, there are certainly case studies revealing instances in which each has likely had a significant impact on international trade. The WTO has an Agreement on Import Licensing Procedures, and a prominent recent concern has arisen over Argentina's institution of import licensing requirements for hundreds of products beginning in 2012. In particular, the EU, the United States and Japan have used the WTO's formal dispute settlement process to challenge Argentina's requirements for the declarations needed for import approval, the variety of licences required for the importation of certain goods, and the substantial delay in granting the approval to import. Overall, WTO (2015b) indicates that in at least 44 formal disputes initiated between 1995 and 2015, the complaining country alleged that the responding country violated some element of the WTO's Agreement on Import Licensing. In at least 17 formal WTO disputes during the period, the complaining country alleged that the respondent violated some element of the GATT/WTO provisions on customs valuation.

There is a small but growing empirical literature examining how these administrative channels affect trade; indeed, governments have recently put a priority on them through the WTO's newly negotiated Trade Facilitation Agreement. The World Bank's *Doing Business* reports are the best known source of comprehensive data about time delays and related problems associated with moving goods across a border. Djankov et al. (2010), for example, use these data to estimate a gravity model of trade and find that each additional day of delay before shipment reduces trade by more than 1%. Furthermore, Volpe et al. (2015) utilize detailed export transaction data from Uruguay to estimate the impact of customs delays on firm exports. Finally, research using data on customs

[bl] For a discussion, see Bown (2010, pp. 307–311). The leverage that the United States and EU arguably had with China was that they could have imposed the China-specific transitional safeguard—eg, an import tariff—to curtail China's export growth. By agreeing to the VERs, China was able to keep the quota rents associated with the (potentially inevitable) border restrictions.

valuation to examine bureaucratic corruption and tariff evasion includes Javorcik and Narciso (2008) for Eastern Europe and Mishra et al. (2008) for India.

4. THE HISTORICAL EVOLUTION OF BORDER BARRIERS UNDER THE GATT

Focussing thus far on trade barriers imposed at the border, we have characterized the contemporary landscape of trade policy as both having significant heterogeneity in applied tariffs, but also as being littered with numerous other border barriers. Collectively and cumulatively, the status quo is of trade policy marked by variation across countries, products, and trading partners. But how did the international trading system arrive at this point? With only a few exceptions, our discussion of history thus far has been limited to the evolution of trade policy since the 1995 inception of the WTO. Here, we briefly appeal to a longer view of the history of the multilateral trading system by focusing on major trade policy developments taking place over the period spanning 1947–94, covering the full GATT era.

We begin with the level of tariffs for the major economies at the outset of the GATT negotiations in 1947 that established the new multilateral trading system.[bm] After reporting on the subsequent evolution of applied tariffs, we introduce the major exceptions to the GATT rule that countries should limit the form of their import protection to their applied MFN tariffs and we assess recently released data from the GATT Archives on their use. One key observation is that protectionist forces have been pushing back against trade liberalization since the inception of the multilateral system. Amidst a general decline in tariffs, new trade restrictions emerged. Thus still open questions for researchers to pursue include quantifying the importance of this push-back and further clarifying how it relates to the policy substitution that we documented in Section 3 as having arisen today.

The GATT members introduced a number of contingency clauses regarding the use of trade restrictions when they drafted the agreement because they understood that changing economic conditions might force countries to face pressure to renege on their tariff commitments. We have already observed the current incarnation of a number of these provisions, such as antidumping and safeguards, as they have been part of the GATT since its origin. In other instances, the exceptions that we introduce later arose on an ad hoc basis and were not anticipated when the GATT was written. In a few others, their use waned and they have largely disappeared from the current policy landscape.

In keeping with our organizational structure, we use the lens of policy instruments to describe the major trade policy developments arising during the GATT era. We begin by

[bm] The historical context matters, as the GATT system arose and was shaped by a number of major geo-political events. These include the catastrophic economic policies of the 1930s Great Depression era, the devastation of Western Europe and Japan during World War II, and the rise of the Cold War between the United States and Soviet Union. See, for example, Irwin et al. (2008) for the negotiating origins of the GATT.

examining the procedures by which countries could increase their MFN tariffs through renegotiations, before we push beyond applied tariffs to other border barriers. We also introduce an emergency import restriction necessitated by the fixed exchange rate regime of the postwar era that countries could implement to address a macroeconomic (balance of payments) crisis.

We also highlight other exceptions and carve outs that arose during the GATT period, some of which cannot be tied to any singular policy instrument or exception. In particular, the GATT had to accommodate the contentious integration of major new members such as Japan into the system; it responded to demands from developing countries for special and differential treatment; it sought to retain relevance despite major economies brokering side deals that resulted in entire sectors (textiles and apparel, agriculture) being pulled out of certain elements of the system; it oversaw the rise of less transparent and less market-oriented "grey area" measures such as voluntary export restraints; and it witnessed the increased use of antidumping by high-income economies, a temporary trade barrier policy that has since exploded in use globally.

In a final section we draw a few implications from this era for contemporary research and policy. Some of the policies of importance were only temporary; others have arguably had effects that persist to this day. Along the way, we also highlight both our main themes and important venues for additional research, especially given the troves of historical data, digitization, and electronic archives increasingly being made publicly available to researchers.[bn]

4.1 Pre-GATT 1947 Tariff Levels and Tariff Trends Over the GATT Period

The GATT negotiations began in 1947 with 23 countries—referred to as "Contracting Parties"—ultimately signing the agreement. The initial activity consisted of a round of reciprocal tariff cutting negotiations between those countries, as well as the establishment of a set of principles, rules and exceptions, set out as distinct "Articles" in the agreement, that together launched the new multilateral trading system.[bo] The United States, Canada, Australia, the countries of Western Europe, and the other Contracting Parties then repeatedly convened under GATT negotiating rounds over the next five decades to bargain for additional tariff reductions and sometimes consider adoption of new rules.[bp] Eight different negotiating rounds were initiated and concluded between 1947 and 1994.

For a number of reasons, very little is known about the exact levels of import tariffs that countries applied in 1947, immediately prior to the first set of GATT tariff-cutting

[bn] Data Appendix includes a detailed introduction and discussion of the GATT archival data utilized in this Section.

[bo] For a description of the key GATT Articles—the rules and exceptions—that we have introduced and referenced throughout this chapter, see Table A.3.

[bp] Bagwell et al. (2015), for example, present a micro-level empirical bargaining investigation of the negotiations that took place during the GATT's (third) set of negotiations, referred to as the "Torquay Round" of 1950–51.

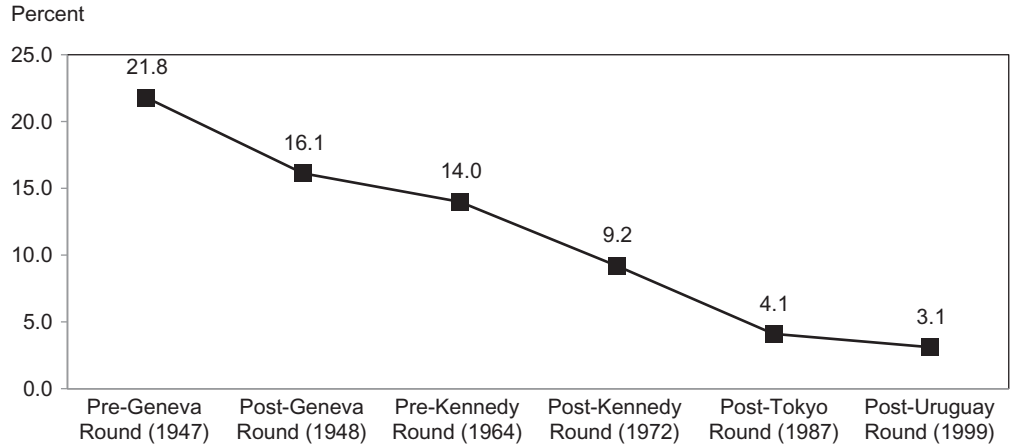

Fig. 12 Estimates of average tariffs for the United States, Western Europe, and Japan, 1947–99.
Bown, C.P., Irwin, D.A., 2015. The GATTs starting point: tariff levels circa 1947. NBER Working Paper No. 21782, fig. 1, based on backcast estimates for 1947 average tariffs, computed from data on simple average tariffs in effect at the beginning of the Kennedy Round (1964), and reports on the size of average tariff cuts arising during the initial GATT negotiating rounds.

negotiations. Bown and Irwin (2015) suggest that the average applied import tariff in 1947 was likely around 22% for the United States, Japan, and the major countries of Western Europe.[bq]

While the exact starting point for tariff negotiations may not be known, there is a consensus on the evolution of average applied imports tariffs for these major economies over the subsequent decades. Overall, Fig. 12 presents the path of average tariffs for these major countries between 1947, beginning at roughly 22%, and 1999, by which time most of the GATT's Uruguay Round tariff reduction commitments had been phased in, at roughly 3%.

[bq] A separate issue is the extent to which applied import tariffs were even the major policy constraint on trade flows at the time; eg, Curzon (1965, pp. 80–81) points out that quotas and foreign exchange controls were major impediments to trade for many countries during this era. Nevertheless, Bown and Irwin (2015) suggest a number of reasons why even calculating average tariffs for 1947 is difficult. First, there was a lack of transparency across countries about their applied tariff policies; ie, data unavailability. Second, even if data were available, there was no common tariff classification scheme across countries, making it potentially difficult to make meaningful cross-country comparisons of simple average tariffs. Third, alternative measures of trade-weighted average tariffs, while readily calculable from available data, suffer from potentially severe biases associated with high tariffs leading to low import volumes and thus under weighting. Fourth, the frequency of tariffs being applied as specific duties is known to have been a major measurement issue for United States tariffs during the period (eg, Irwin, 1998a,b; Crucini, 1994); and while the prevalence of specific tariff use for other countries during this period is unknown, it is expected to potentially also play a major complicating role. Note that Ossa (2014) adopts a distinct approach that relies on quantitative modeling techniques to construct counterfactual estimates for the size of Nash (noncooperative) tariffs in a model featuring seven regions (including the United States, EU, Japan, China, India, Brazil, and rest of the world). He computes the median tariff to be 58.1%, which is somewhat higher than estimates of the pre-GATT levels of average applied tariffs described earlier.

However, the remainder of this section showcases a number of ways by which this headline result, of a broad downward trend in average tariffs for the major economies, is nevertheless incomplete. First, this figure reveals nothing about the applied tariffs for countries other than the United States, Japan, and Western Europe, most of which have quite different end points (see again Table 1) as well as tariff liberalization experiences getting there.[br] Second, even for the major economies, the average tariff fails to capture what was happening with other border barriers during this period.

4.2 Changing Tariff Rates Under the GATT

Two distinct legal provisions in the original GATT permitted countries to increase their tariffs after negotiations with key trading partners. The first was for permanent changes to the tariff (Article XXVIII), and thus was a renegotiation of binding commitments. The other allowed a temporary increase to the tariff (Article XIX) in light of unforeseen, but temporary, events. One common feature of both is that tariff-changing countries were required to provide *compensation* to the affected trading partners. This compensation could take the form either of a mutually agreeable tariff reduction in some other sector or of the affected trading partner being permitted to raise its tariff in some other sector in response. A second common feature is that, unlike other GATT provisions introduced later, these changes to tariffs were meant to apply only to limited and well-defined *products*, and not entire sectors or bundles of imports.[bs]

Over the entire GATT period of 1947–94, countries invoked Article XIX on 150 different occasions to increase their tariffs temporarily and Article XXVIII on 275 occasions to increase their tariff bindings permanently (WTO, 1995). While there is little empirical research examining use of these provisions, access to some newly available archival data from the 1950s allows us to investigate patterns to some of the new import restrictions triggered right after the GATT's inception.[bt] For example, the early GATT

[br] The WTO (2007) provides an important survey of the first 60 years of the GATT/WTO system and includes additional, country-specific descriptions of tariff data over the decades for a number of countries not covered in depth here, such as Brazil, India, Senegal, Nigeria, Argentina and Korea (pp. 211–219).

[bs] For example, an Article XIX action typically involved a tariff line or group of products like "hatter's fur" (US, 1951), "strawberries" (Canada, 1957) or "hard coal" (West Germany, 1957) rather than a broad industrial classification like "chemicals" or "machinery."

[bt] Bown (2004) examines invocations of Article XIX and XXVIII over the 1973–94 period in one of the relatively few empirical studies seeking to explain why countries used these provisions to implement additional import protection. The evidence there is consistent with a theory that countries invoked these exceptions when they needed to make changes to their trade policies between negotiating rounds and wanted to do so in accordance with GATT rules so as to avoid a dispute and potentially more severe retaliation by affected trading partners. For a theoretical exploration of the different GATT rules on *compensation* under Article XIX and XXVIII vs under dispute settlement (GATT Article XXIII), see Bown (2002a). A case study of US import policy in the 20th century by Baldwin (1985) suggests that the United States' use of Article XIX cycled with changes in US trade law. The US law regarding safeguards varied in the stringency of qualifying criteria over decades with the result that safeguards were never used under the 1962 US Trade Act but were far more common after reforms to the law in 1974.

negotiations for tariff reductions could have significantly over-estimated the amount of tariff-cutting liberalization that government might be able to sustain, thus triggering the need to raise tariffs.

We begin with the permanent tariff increases triggered under Article XXVIII. Between 1950 and 1959, the GATT Contracting Parties invoked Article XXVIII only 70× (WTO, 1995). Thus it appears that formal actions to raise tariffs permanently under Article XXVIII were relatively rare, and when they arose, the requests were scattered across countries and sectors. The lack of major permanent tariff increases, at least for the major GATT members, is consistent with the downward trend in average applied tariffs for these countries over the GATT period (see again Fig. 12).

Next, consider the frequency with which countries resorted to *temporary* escape from their tariff commitments (Article XIX). A distinctive element of this channel is the mandate that, in order to justify use of Article XIX, governments were required to provide some evidence of unforeseen events having taking place, and that increased imports of the product were causing injury to the domestic, import-competing industry. Notably, the Article XIX provision has subsequently been transformed into the WTO's Agreement on Safeguards. We have presented cross-country data on safeguards use over 1995–2013 in substantial detail in Section 3.1.

Overall, countries triggered temporary tariff increases in only 19 instances under Article XIX over 1950–59; the United States requested slightly more than half.[bu] Fig. 13 displays Article XIX use over 1950–59 so as to make comparisons to safeguard use in more recent decades. The figure presents the share of all cases that high-income and developing countries triggered in the different periods by sector.[bv] There has been a dramatic change in the sectoral distribution of safeguard use over time. In the 1950s, high-income countries utilized safeguards in a wide variety of sectors, including footwear, minerals, transportation equipment, textiles, and plastics. More recently, they have used safeguards primarily to restrict trade in metals. The pattern of concentration across industries for developing countries is reversed; two thirds of safeguards in the 1950s were in one sector (machinery); more recently developing countries have implemented safeguards more diffusely across a number of industries, including chemicals, plastics, wood products, textiles, stone, metals, and machinery.

In summary, actions to raise tariffs in the first decade of the GATT appear to have been in disperse product categories across a wide variety of countries. Unlike other policy tools discussed later, Article XIX and XXVIII were not used to dramatically reduce imports at the aggregate level or to dramatically reduce trade in an entire sector of the economy.

[bu] Data on Article XIX investigations between 1950 and 1959 was collected from the GATT digital archive at Stanford University and each verbal description of a product was matched to the modern HS06 product classification.

[bv] The definition of core European countries is West Germany, France, the Netherlands, Belgium, the United Kingdom, and Italy.

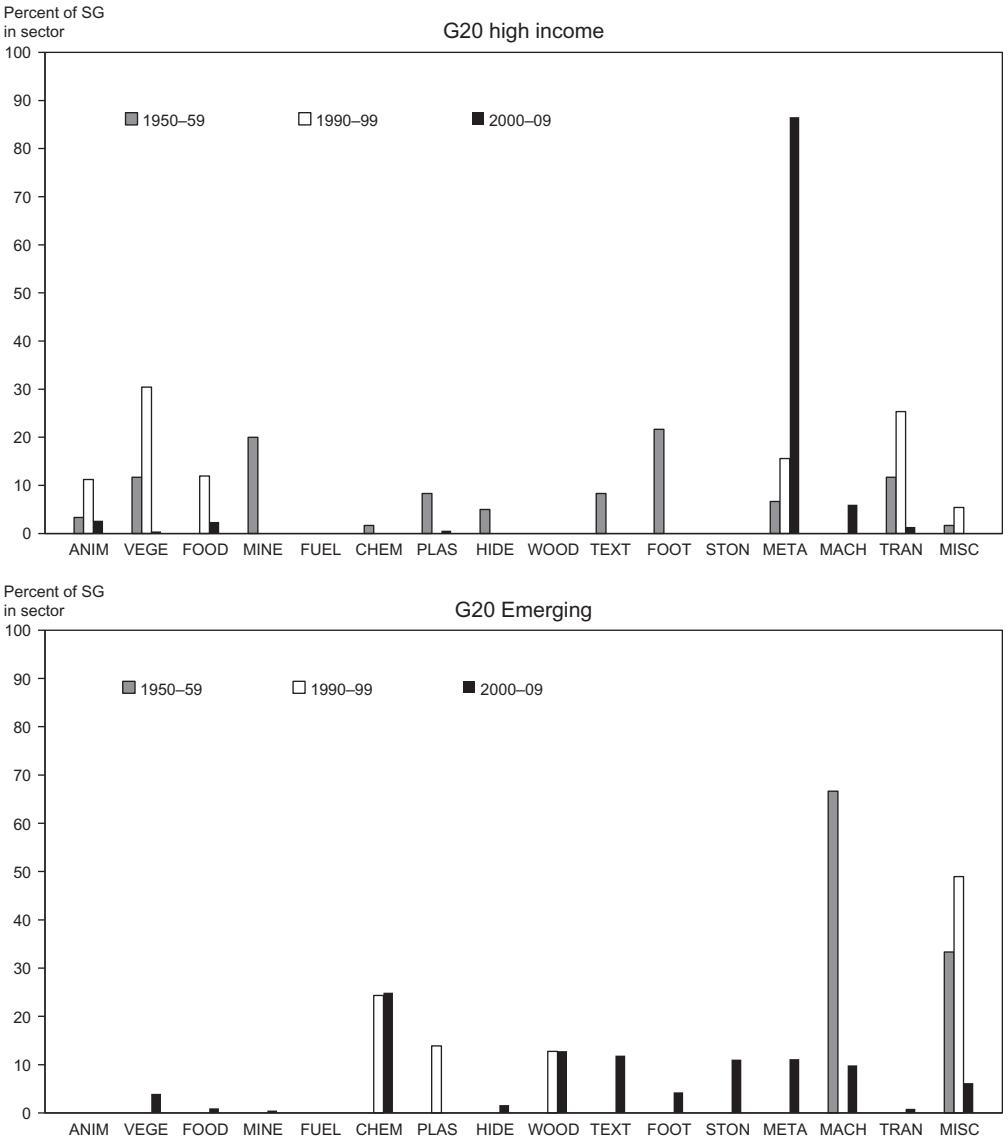

Fig. 13 Temporary import protection actions under Article XIX and WTO agreement on safeguards: Share of total investigations by sector by decade.

Constructed by the authors from Bown, C.P., 2014a. Temporary trade barriers database. The World Bank. Available from: http://econ.worldbank.org/ttbd/ (accessed 25.07.14) and L: series reports from 1950 to 1959 in the GATT digital archive. The share reported for each decade is the count of safeguards investigations by HS06 product and export origin within one of 16 industrial sectors divided by the count of safeguards investigations by HS06 and export origin summed over all industrial sectors.

4.3 GATT Exceptions and the Rise of Major Carve-Outs

In this section we briefly introduce a number of major exceptions to the general application of the GATT rules and procedures that resulted in important "carve outs" from liberal trade during 1947–94. These take on a number of different forms.[bw]

4.3.1 Emergency Import Restrictions to Address Balance of Payments Problems

From the end of World War II until 1971, the major economies participated in the Bretton Woods system of fixed exchange rates in which countries pegged their currencies to the US dollar.[bx] Understanding that macroeconomic forces could lead to an overvalued currency, and that this could lead to a balance of payments (BOP) deficit and the loss of foreign currency reserves, the GATT included Article XII, which explicitly permitted government use of import restrictions to defend a currency's peg and prevent a forced devaluation.[by] Balance of payments actions were rarely used by the major economies after the system of flexible exchange rates was introduced in 1971.[bz] However, when BOP actions were taken during the GATT's first 25 years to address a fundamental macroeconomic imbalance, they tended to be broad-based import restrictions of sizeable magnitudes. This is quite distinct from the product-specific (Article XIX, XXVIII, or antidumping) exceptions or even sector-specific exceptions introduced later regarding textiles and apparel, and agriculture.

To give one example, in January 1952, the government of the United Kingdom was forecasting a balance of payments deficit for 1952 of about £500 million. The Chancellor of the Exchequer circulated a top secret Cabinet memo which declared: "The gold and dollar reserves continue to fall at an alarming rate... unless we tackle this situation... by the middle of the year we shall not be able to hold the pound at $2.80... Unless we stem this tide, it will swallow us up, and we shall reach a point at which we can no longer buy the basic food and raw materials on which this island depends..." (Butler, 1952). By early March, the UK suspended or restricted imports on an enormous variety of foodstuffs and manufactured goods— including cheese, cloth, dishwashing machines, roof tiles, metal buckets, fish hooks, and umbrellas—with the objective of reducing imports in 1952 by "about 10 per cent of the value of imports in the year 1951." (UK, 1952)

[bw] This section deliberately omits reference to preferential trading arrangements; see again our earlier discussion in Section 2.3. The one major example of a successful and sustained PTA established early in the GATT era was the European Economic Community. Other major PTA examples such as CUSFTA/NAFTA, MERCOSUR, and ASEAN were all established at the tail end of the GATT period.

[bx] In 1971, the Bretton Woods system effectively collapsed when the United States abandoned the gold standard.

[by] Irwin (2012) describes how the mismanagement of currencies contributed to the disastrous trade policy environment of the 1930s and thus to the deepening and persistence of the Great Depression.

[bz] BOP consultations and import restrictions continued in the 1970s and 1980s for many small and low-income countries that pegged their currencies to a major currency after the collapse of Bretton Woods.

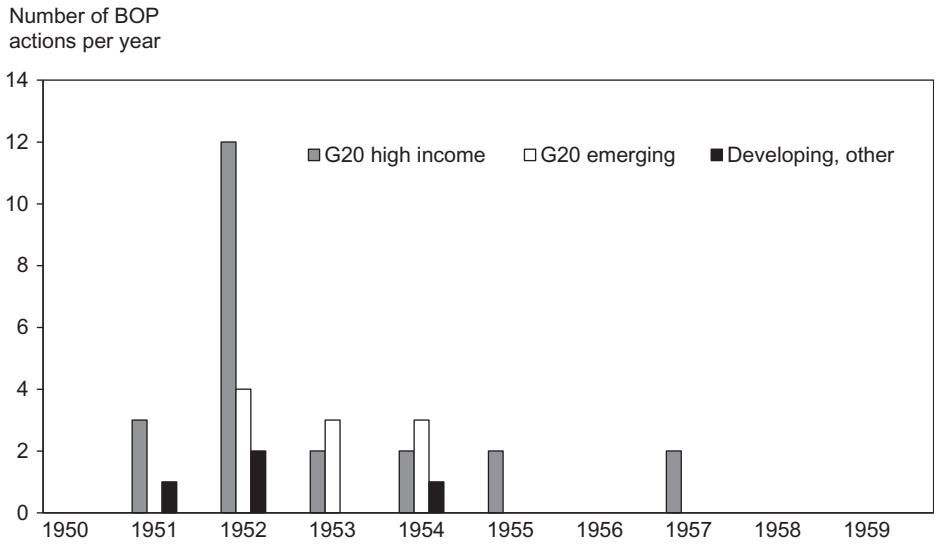

Fig. 14 Balance of payment import restrictions under Article XII, 1950–59.
Constructed by the authors from the L: reports from 1950 to 1959 in the GATT digital archive.

Fig. 14 presents data on the number of import restrictions necessitated by BOP problems between 1950 and 1959.[ca] While the absolute number may be small in any given year, the actions taken as a fraction of the total GATT membership at the time were sometimes substantial. For example, in 1952, *nearly half* of the initial 23 GATT Contracting Parties—Australia, Brazil, Chile, Finland, France, New Zealand, Pakistan, Rhodesia, Sweden, South Africa and the United kingdom—imposed import restrictions for balance of payments problems.

4.3.2 Japan's GATT Accession and the "Temporary" Article XXXV Exception

Two major economies were not included as part of the original 23 Contracting Parties that negotiated the launching of the GATT at the end of World War II—West Germany and Japan. Both were eventually allowed entry—West Germany acceded in 1951 and Japan acceded in 1955.[cb]

However, Japan's accession to the GATT, and its reindustrialization and export-led growth strategy, led to a major period of adjustment for many other GATT members.

[ca] These data on the number of reports to the GATT of import restrictions necessitated by BOP problems are collected from the GATT Digital Archive.

[cb] As we have already discussed, during the period in which West Germany was becoming a formal part of the GATT system, it was also involved in substantial efforts at Western European integration, including the ECSC in 1951 and the 1957 establishment of the European Economic Community and customs union. See again Section 2.3.

Indeed, upon Japan's GATT entry in 1955, more than 50 countries invoked the GATT's Article XXXV exception which allowed them to refuse to apply the Agreement's legal obligations to their trade with Japan. The implication was that most of the GATT membership set a higher tariff on imports from Japan, even after it joined the GATT, than the MFN tariff they applied to imports from all other members.[cc]

The length of this temporary nonapplication of the GATT varied substantially. Australia, Belgium, France, Netherlands, and the United Kingdom did not recognize Japan's full membership into the GATT for nearly a decade (until 1963 or 1964). Others did not revoke their Article XXXV exception, and thus reduce their tariff on imports from Japan to MFN levels, until the 1970s or later.

4.3.3 The Rise of Voluntary Export Restraints, Including the Multifiber Arrangement

Unlike much of the GATT membership, the United States championed Japan's accession to the GATT and offered Japanese exporters MFN tariff treatment in the US market. However, industries in the United States also faced acute pressure as they struggled to adjust to suddenly increasing imports from Japan. This led the US government to use a number of *other* policy instruments to slow down Japan's export growth; the most prolific of these were in the form of negotiated voluntary export restraints, the policy that we introduced conceptually in Section 3.3.

One major set of quotas and VERs arose in the face of increased imports of textiles and apparel from Japan; this led first to the Short Term arrangement covering cotton textiles (1961–62), followed by the Long Term arrangement covering cotton textiles (1962–74), and ultimately the multifiber arrangement (MFA) that remained in place between 1974 and 2004.

The textile and apparel sector turned out to be the tip of the iceberg for the VERs that the United States negotiated with Japan. For example, in the decade between 1975 and 1984, the United States had at least six different sectors in which its safeguard (Article XIX) investigations ultimately resulted in VERs with Japan, including autos, televisions, steel and footwear (Bown and McCulloch, 2009). Furthermore a set of US antidumping investigations begun in 1985 over DRAMS and other semiconductors also resulted in VERs with Japan.

To be clear, there was no GATT legal exception or provision that expressly authorized VERs—indeed, they were often referred to as "grey-area" measures, and as we described earlier, this outcome has been banned for safeguard investigations under the WTO's Agreement on Safeguards. Under the GATT, VERs arose on an ad hoc basis, and they were frequently the result of negotiations that had developed after the United

[cc] On the other hand, Japan did not invoke the Article XXXV exception and thus granted MFN tariff treatment to all GATT members, including the ones that invoked Article XXXV.

States had a domestic industry trigger one of the other potential GATT exceptions, such as a safeguard (Article XIX) or antidumping (Article VI) investigation.

4.3.4 Agriculture

From the GATT's inception, the agricultural sector was treated as unique and thus one for which the GATT rules and obligations would not comprehensively apply. Two of the primary proponents for such an approach were the United States and the countries of Western Europe. Indeed, the United States had requested and was granted a waiver (under Article XXV) in 1955 that even the basic GATT provisions on tariffs (Article II) and quantitative restrictions (Article XI) not be applied to its agricultural sector. Europe was also not in favor of applying basic GATT tenets to the agricultural sector; beginning in the late 1950s, the EEC was busy developing its Common Agricultural Policy (CAP) of integrating European agricultural markets; policies included high border barriers as well as establishing a complex system of subsidy programs.[cd]

Without understating the importance of the sector, we limit further discussion here to two additional points. First, although agriculture was seen as special during the period, a number of formal and contentious trade disputes concerning the sector arose under the GATT. In particular, the United States and EEC formally confronted each other on a number of different occasions.[ce] Second, while agriculture was formally brought back into the multilateral system through the WTO Agreement on Agriculture in 1995, it remains a sector marked by high levels of import protection. As we have already observed via Figs. 2, 3, and 7, contemporary tariffs (applied rates and bindings) in the sector remain high, with a high incidence of both tariff peak products and tariffs applied as specific duties, and some countries continue to implement quotas in the sector (Section 3.2). Furthermore, and as we will discover in Section 5, agriculture is a sector characterized by significant *domestic* policy interventions, such as subsidies, crop insurance, and other price (and income) support schemes, and is one in which special trade rules for health and safety (through the WTO Agreement on Sanitary and Phytosanitary Measures) frequently apply.

4.3.5 Special and Differential Treatment for Developing Countries

The GATT was a voluntary agreement. Countries individually decided how much tariff cutting they would attempt to extract from trading partners via the repeated rounds of multilateral negotiations and, in return, how much tariff-cutting they would agree to

[cd] For an introduction to agricultural issues in the GATT and WTO, see Hoekman and Kostecki (2009, pp. 270–303). For historical data dating back to 1955 on agricultural distortions in major markets, see Anderson and Nelgen (2013).

[ce] Disputes arose in a challenge to the CAP in 1962, and in bilateral skirmishes in products including dairy, processed fruits and vegetables, animal feed proteins, sugar, poultry, as well as the infamous "chicken war" (Hudec, 1993).

undertake at home. A number of major developing countries helped to found the GATT in 1947, including Brazil, Burma, India, Pakistan, South Africa, Sri Lanka, and Zimbabwe. In the 1950s and 1960s, the GATT membership expanded to include a number of developing countries after they gained independence from colonial rule. Nevertheless, during most of the GATT period, many developing countries did not pursue export-oriented trade and development strategies, but instead chose to pursue import-substitution regimes.

The original GATT 1947 introduced special and differential treatment (SDT) for developing countries via Article XVIII. In the 1960s, the GATT adopted its Part IV "Chapter on Trade and Development" which specified additional principles by which high-income countries were encouraged to reduce trade barriers in products of particular interest to developing countries. Finally, in the 1970s major economies like the European Economic Community and United States implemented lower-than-MFN tariffs on imports of many products from developing countries under the Generalized System of Preferences (GSP). This exception to MFN was brought into the GATT system legally with the adoption of the Enabling Clause in 1979.

Looking back at this historical episode, however, the consensus is that the GATT period was not a successful one for integrating developing countries into the multilateral trading system. One explanation offered by economists is that all of the exceptions associated with SDT combined to result in a strong *disincentive* for developing countries to engage the same "reciprocity" process that was the mechanism that arguably made the GATT such a success for the high-income countries. Because developing countries had been offered export market access (via unilateral preferences) "for free," developing countries did not have to simultaneously reform their import-competing sectors; this is what high-income countries had been required (by general equilibrium market forces) to do in exchange for the reciprocal market access that had been granted to their exporters.[cf]

Second, because developing countries did not offer any market access of their own in exchange for special tariff cuts, they could not influence either the products or the countries from which they would receive these tariff cuts. And, as we observed already via Figs. 9 and 8, countries typically did not offer unilateral tariff cuts for 100% of their imported products even to developing country exporters under PTAs. Furthermore, the comparative advantage of most developing countries had them involved in globally diffuse export sectors; the result was low-income countries had great difficulty in organizing negotiations among themselves to coordinate tariff liberalization "requests" being made of major importing countries (Ludema and Mayda, 2013).

[cf] McCulloch and Pinera (1976) offer an early skeptical view of the benefits of GSP, for example. Subramanian and Wei (2007) provide empirical evidence that the GATT had relatively little impact on developing country trade, potentially due to the asymmetries implied by such preferences. See also Staiger (2006), Bagwell and Staiger (2014), and Ornelas (2016).

Overall, developing countries were not successful at getting their true export interests reflected as part of negotiated bargains. As such, one legacy of the GATT period is that agriculture, textiles and apparel, and footwear—sectors of production and export interest for developing countries—were essentially excluded from much of the trade liberalization that took place.

4.3.6 Antidumping in Historical Perspective

The last trade policy exception from the GATT period that we introduce is antidumping.[cg] As described in Section 3.1, the GATT system permitted countries to impose antidumping import restrictions against products sold at low (dumped) prices if such imports caused injury to the domestic, import-competing industry. Today antidumping is in use by a wide range of high-income and emerging economies.

Prior to the 1990s, only four economies—Australia, Canada, the EEC and the United States—used antidumping import restrictions with any regularity.[ch] In the 1980s, for example, the United States began to use antidumping with increased frequency to address the import growth in a number of different sectors from Japan, as well as some of the other newly industrializing economies of East Asia, such as Korea and Taiwan.[ci]

Here, we take advantage of newly compiled data on historical use of antidumping by the GATT's high-income economies so as to compare their use of the policy during the 1970s with their more contemporary use. Fig. 15 depicts the share of antidumping investigations across industrial sectors for three different decades.[cj]

Interestingly, the figure reveals a number of similarities arising for antidumping use by both the United States and Europe. In the 2000s, the industry demands for new import restrictions were mostly concentrated into the metals (steel) sector. However, this was not always the case. In the 1970s, less than 25% of US antidumping investigations were in the metal sector. In both economies in the 1970s, antidumping use was much more evenly dispersed across sectors, including chemicals, machinery, plastics, stone, and transportation equipment.

[cg] Under the GATT 1947, both antidumping and countervailing duties were permitted under Article VI. Additional provisions for these policies were put forward through "plurilateral codes" as a result of the GATT's Tokyo Round of negotiations in 1979.

[ch] South Africa was also a major user of antidumping during the period between 1921 and the 1970s; for a discussion, see Edwards (2011).

[ci] See Irwin (2005) for a presentation of the historical use of antidumping by the United States. Blonigen and Prusa (2016) survey the literature on antidumping; most of the early empirical research in particular that had arisen in the 1980s and 1990s had focused on the United States and, to a lesser extent, the European Economic Community.

[cj] Data used to construct these figures for 1970–79 come from the GATT digital archive series COM.AD, and for 1990–2000 from the Temporary Trade Barriers Database. For the 1970s, we mapped the verbal descriptions of products involved into HS06 product categories.

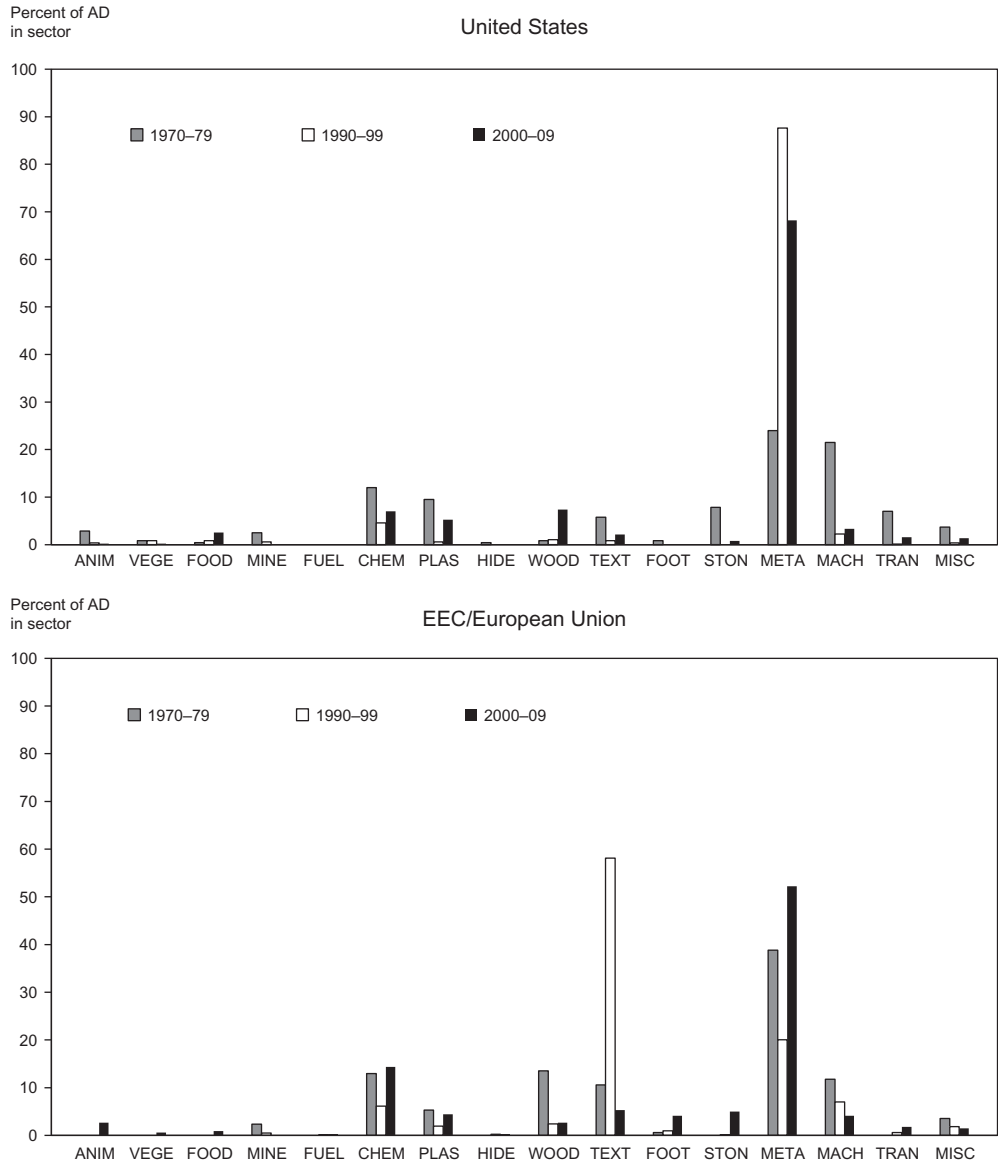

Fig. 15 Article VI and agreement on antidumping: Share of antidumping investigations by sector by decade.

Constructed by the authors from Bown, C.P., 2014a. Temporary trade barriers database. The World Bank. Available from: http://econ.worldbank.org/ttbd/ (accessed 25.07.14) and COM.AD reports from 1970 to 1979 in the GATT Digital Archive. The share reported for each decade is the count of antidumping investigations by HS06 product and export origin within one of 16 industrial sectors divided by the count of antidumping investigations by HS06 and export origin summed over all industrial sectors.

4.4 Implications for the Contemporary Landscape of Trade Policy

We summarize our brief history of the GATT period with four important observations that build upon our chapter's main themes.

First, for the GATT period, an empirical analysis focused exclusively on applied tariffs may result in a serious mischaracterization of the landscape of trade policy. Whether it was the implementation of quantitative restrictions to protect the balance of payments due to aggregate-level shocks in the 1950s, the imposition of Article XIX (safeguard) exceptions, the exemption of Japan from MFN tariff treatment for a decade (*after* its GATT accession), the rise of sector-wide voluntary export restraints (the MFA), the proliferation of VERs in other major sectors and markets (US steel, autos, footwear), or the inception of antidumping; from the GATT's earliest years, the full story of border barriers under the multilateral trading system requires much more than examining measures of applied tariff rates.

Second, there can be substantial shifts away from one border policy tool and toward another, even within countries and potentially within sectors, over the decades. For example, consider the United States, and the textiles and apparel industry. The United States used both temporary (Article XIX) and permanent (Article XXVIII) actions to restrict imports of textiles and apparel in the 1950s. However, with the subsequent establishment of the short- and long-term arrangements on cotton textiles and then the MFA, beginning in 1961, the next four decades featured a notable absence of US special import restrictions in these sectors under its antidumping and safeguard policies.

Third, while each of these policy instruments has had at least one episode of major use, sometimes particular policies fall out of favor. This can occur for a variety of different reasons. For VERs, the new rules developed under the WTO Agreement on Safeguards, which were negotiated by the same countries that utilized this policy in the 1980s, were explicitly written to discourage their use. In this case, it appears that governments were tying their own hands to reduce the use of a policy that they understood had undesirable costs. However, these same governments appear to have turned to something else (eg, antidumping and price undertakings) when new demands for protection arose. For the balance of payment exceptions, however, the demand was largely eliminated with the collapse of the Bretton Woods system of fixed exchange rates.

Fourth, given the relative substitutability of many of these policy instruments, and perhaps due to the fact that many of the "problems" that trade policy is seen to solve remain the same (eg, competitive adjustment due to new market entrants, macroeconomic shocks, exchange rate misalignment for currencies that are not truly floating, etc.), it also turns out that history tends to repeat itself. Frequently the story-line stays the same, it is simply the countries, sectors, governments, or particular policy instruments that change.

We conclude this section by highlighting some of the parallels between what is perhaps the most significant trade policy "issue" of the most recent period—ie, the integration of China into the global trading system—with events that took place in the 1950s. First, the 2001 WTO accession of China mirrors certain aspects of the 1955 GATT accession of Japan. For example, while the GATT membership in the 1950s adjusted to Japan's entry by either raising tariffs (above otherwise mandated MFN levels) by invoking Article XXXV or negotiating VERs, the WTO membership in the 2000s adjusted to China's entry by imposing product-specific import restrictions like antidumping (see again Section 3.1 and Table 6).

Second, the 1950s and the 2000s also featured significant concerns over macroeconomic imbalances with implications for trade policy.[ck] In the 1950s, under the Bretton Woods system, many countries implemented import restrictions for balance of payment purposes. In the 2000s, under a system of flexible exchange rates for major currencies (dollar, euro, yen) and fixed or managed exchange rates for others (renminbi), interest has returned to using import policy to address macroeconomic imbalances, including those associated with China's current account surplus and its potentially "undervalued" currency. Economics has no universally-accepted definition of what constitutes an "undervalued" currency and, even if one were developed, it is unclear whether the WTO would have the institutional capacity to effectively monitor and enforce currency values. Nevertheless, an evocative academic debate arose during the 2000s regarding the appropriate role for including currency manipulation provisions into trade agreements.[cl]

5. BEHIND-THE-BORDER POLICIES

This section returns to *contemporary* economic policies and pushes beyond border barriers to introduce some of the domestic laws and regulations that can also significantly impact international commerce. "Behind-the-border" (BTB) policies start with straightforward domestic taxes and subsidies; these policies mostly become relevant when their *application* discriminates between domestic- and foreign-produced varieties of substitutable goods. However, concerns over BTB policies quickly move beyond taxes and subsidies and

[ck] To be clear, the 1950s were not the only episode during the GATT era in which macroeconomic shocks triggered major trade policy actions. See, for example, the Nixon-era US import surcharge in response to the Bretton Woods collapse in 1971 (Irwin, 2013), or the pressure on US trade policy in the 1980s due to the over-valued dollar prior to the Plaza Accord.

[cl] See Mattoo and Subramanian (2009) for arguments in favor of bringing the issue of currency undervaluation into the WTO; Staiger and Sykes (2010) describe a number of difficulties arising with such a proposal. The gradual appreciation of the Chinese renminbi against major currencies since 2005 served to decrease some of the intensity of the debate around the issue.

increasingly include competition policy, foreign investment regulations and local content requirements, labor and environmental regulations, other production process standards designed to protect animal or plant health, product standards to ensure consumer safety, and product labeling that is a response to consumer demands for information.

We bring BTB policies into our analysis for three reasons.

First, economic theory shows that the effects of an import tariff can be replicated through the appropriately chosen combination of a domestic consumption tax and a domestic production subsidy. Thus, if left unconstrained, we expect governments to implement such domestic policies, if only to simply replace dismantled import tariffs. Just like the various motives to impose tariffs in the first place, these taxes and subsidies may be due to government incentives to shift costs onto trading partners (eg, Bagwell and Staiger, 1999, 2001) or because of commitment problems with respect to their private sectors (Maggi and Rodriguez-Clare, 1998; Limão and Tovar, 2011).

Second, while our description later focuses on contemporary BTB policies, the trade restrictiveness concerns over BTB policies are not merely theoretical; governments have long confronted the possibility of policy substitution by addressing the issue through trade agreements. Even the original GATT 1947 did not ignore BTB policies; it included the nondiscrimination principle of national treatment (Article III) which states explicitly that, aside from the import tariff that a good must pay to cross the border, imports could not be subject to additional forms of regulatory or tax discrimination (Horn, 2006). However, the GATT also explicitly allowed governments to impose BTB policies (that might affect trade) through Article XX's "General Exceptions" for conservation of exhaustible natural resources, public (animal, plant, and human) health, public morals, etc. The establishment of the WTO in 1995 created further Agreements attempting to clarify some of the characteristics for permissible BTB policy interventions, including those concerning animal, plant, or human health (Sanitary and Phytosanitary—SPS—measures) and also product standards (technical barriers to trade—TBT—measures). Furthermore, the United States and EU especially have negotiated a number of PTAs since the early 1990s that go even further, often resulting in negotiations over BTB policies themselves.

Third, the trade restrictiveness of BTB policies ultimately ties back into our chapter's five main questions. Even though we have established that tariffs and other nontariff border barriers have not been eliminated for all countries and in all sectors, in some countries and in some sectors border barriers are low. In such cases, logical follow-up questions include, how "liberalized" is world trade with respect to BTB policies? Is there significant variation for levels of import protection arising from BTB policies across countries and industries? Furthermore, do countries use BTB policies to discriminate among trading partners, and do they change the trade restrictiveness of such policies much over time?

To establish expectations, the existing literature and data sources are not sufficiently developed so as answer any of these five questions. Unlike our approach in Sections 2 or 3,

we do not utilize formal data or any summary measures of BTB policies to shed light on these questions.[cm]

Instead, our specific approach is to characterize the contemporary landscape of BTB policies through a survey of case studies of particularly contentious domestic policies that have been the subject of formal WTO disputes.[cn] While the case studies are not comprehensive, they are arguably representative of the BTB policies most frequently challenged under the WTO. They cover roughly 50 formal WTO disputes over BTB policies, or 10% of the population of all WTO disputes arising between 1995 and 2015.[co] And for most of the case studies on BTB policies, we are able to explicitly direct the interested reader to additional research from a now established and growing literature whereby economists have been paired with legal scholars to provide a jointly-written, detailed analyses of the domestic policies, markets, and jurisprudence arising under the individual WTO dispute.[cp] Tables 8–11, in each of the four sections, provide explicit references to the published dispute-specific introductions to the policies and the more detailed analyses.

By introducing these conflicts over BTB policies, we demonstrate that the next major area for the world trading system involves confronting the balance of respecting local preferences, internalizing cross-border policy externalities that arise through trade, and yet integrating economic activity across borders so as to make the most productive use of global resources. And yet not surprisingly, our main result from this section is that much more theoretical, empirical, and quantitative research is needed before we can systematically characterize in any meaningful way the trade restrictiveness, or levels of import protection, associated with BTB policies. Our discussion tends to

[cm] Ederington and Ruta (2016) survey the limited data on BTBs that has been made available to researchers thus far; we do not repeat the exercise here due to space constraints. As of the time of writing, and unlike policies covered in Section 2 and some of Section 3, there are no comprehensive data sets on BTB policies. There have been a few piecemeal approaches that have served as first steps. One has been to survey firms and traders as to which nontariff barriers exporters feel most impede their ability to trade. Other and more comprehensive approaches at data collection are ongoing, including efforts by international organizations such as UNCTAD and the World Bank, that review domestic laws and regulations and categorize them according to an established template of well-defined categories of nontariff measures (NTMs). These NTMs are then also mapped to HS06 products based on the descriptions of the products mentioned in the laws and regulations. While such efforts at data collection and construction are surely a step in the right direction, other significant efforts will be required before these data can be used to address the main questions of this chapter.

[cn] See Bown and Pauwelyn (2010) for a survey of WTO disputes.

[co] For context, the temporary trade barriers (antidumping, countervailing, and safeguards) described in Section 3.1 were the most frequently disputed border policy during the period. Applied TTBs were the topic of more than 175 disputes—ie, more than 35% of all WTO disputes (Bown, 2014a).

[cp] Beginning in 2001, in a project initially sponsored by the American Law Institute, Henrik Horn and Petros Mavroidis initiated a program that annually convened a set of economists and legal scholars so as to provide reports assessing the new case law arising from the WTO's Appellate Body (and unappealed Panel Reports). These joint assessments have subsequently been published annually by Cambridge University Press, primarily through special issues of the *World Trade Review*. In 2011, one of the coauthors of this chapter (Bown) took over codirecting the project (from Horn) with Mavroidis. After more than 15 years, the result is a body of work covering more than 100 WTO legal decisions.

Table 8 Disputed behind-the-border policies predominantly affecting supply, 1995–2015

Behind the border policy	WTO dispute (complaining countries)	Legal-economic research
Subsidies/Taxes		
US and EU subsidies to Boeing and Airbus for large civil aircraft	US–Large Civil Aircraft (EU) EU–Large Civil Aircraft (US) US–Tax Incentives (EU)	Hahn and Mehta (2013) and Neven and Sykes (2014)
Brazil and Canada subsidies to Embraer and Bombardier for regional aircraft	Canada–Aircraft (Brazil) Brazil–Aircraft (Canada)	Howse and Neven (2005a)
China's value-added tax exemption for domestically produced aircraft	China–Tax Measures Concerning Certain Domestically Produced Aircraft (US)	
US cotton farming subsidies	US–Upland Cotton (Brazil)	Sapir and Trachtman (2008)
EU subsidy regime for sugar	EU–Export Subsidies on Sugar (Australia, Brazil, Thailand)	Hoekman and Howse (2008)
US tax exemptions for Foreign Sales Corporations (FSC) regarding their export-related foreign trade income	US–FSC (EU)	Howse and Neven (2005b)
Korea subsidies to semiconductor producers targeted by foreign countervailing measures	Japan–DRAMs (Korea)[a] EU–Countervailing Measures on DRAM Chips (Korea)[a] US–Countervailing Duty Investigation on DRAMs (Korea)[a]	Francois and Palmeter (2008), Prusa (2008), and Crowley and Palmeter (2009)
China subsidies to clean energy products targeted by US countervailing measures	US–Countervailing Measures (China)[a]	Brewster et al. (2016)

Constructed by the authors.
[a]Indicates dispute concerned the trading partner's countervailing duty trade policy response to the subsidy and not the underlying subsidy itself.

disproportionately feature BTB policies that high-income economies impose and that are potentially affecting trade in major sectors of interest to these economies, such as aircraft, semiconductors, clean energy, autos, agriculture, foodstuffs, and also cigarettes and alcohol.[cq] While these features may motivate BTB policies as worthy of additional research

[cq] In their survey of all border and BTB policies subject to WTO disputes over 1995–2011, Bown and Reynolds (2015) find that WTO disputes collectively investigated nearly $1 trillion in goods imports, an average of $55 billion per year, or roughly 0.5% of world imports in 2011.

Table 9 Other disputed behind-the-border policies predominantly affecting supply, 1995–2015

Behind the border policy	WTO dispute (complaining countries)	Legal-economic research
Services and distribution (competition policy)		
Canadian Wheat Board export regime and regulations on distribution of grain imports	Canada–Wheat Exports and Grain Imports (US)	Hoekman and Trachtman (2008)
China regulations on distribution of imported audio-visual, music, and reading products	China–Publications and Audiovisual Products (US)	Conconi and Pauwelyn (2011)
Japan regulations of distributors and retailers affecting the photographic film (Kodak/Fuji) market	Japan–Film (US)	
EU Third Energy Package Directives and Regulations unbundling vertically-integrated provision (production, supply, and transmission) of natural gas or electricity	EU–Certain Measures Relating to the Energy Sector (Russia)	
Animal health and product standards		
India import measures on US poultry products due to Avian Influenza	India–Agricultural Products (US)	Bown and Hillman (2016)
US import measures on Argentine beef after foot and mouth disease outbreak	US–Animals (Argentina)	
Russia import measures on EU pork products after African Swine Fever outbreak	Russia–Pigs (EU)	
Korea import measures on Canada beef after mad cow disease (BSE) outbreak	Korea–Bovine Meat (Canada)	
Other environmental regulations		
US import measures on shrimp caught without using sea turtle excluder devices	US–Shrimp (India, Malaysia, Pakistan, Philippines, Thailand)	Howse and Neven (2003)
EU import measures on seals and related products	EU–Seal Products (Canada, Norway)	Levy and Regan (2015) and Conconi and Voon (2016)
Brazil import measures on retreaded tires out of fear of spread of mosquito-transmitted diseases	Brazil–Retreaded Tyres (EU)	Bown and Trachtman (2009)

Continued

Table 9 Other disputed behind-the-border policies predominantly affecting supply, 1995–2015—cont'd

Behind the border policy	WTO dispute (complaining countries)	Legal-economic research
Japan import measures on apples over concerns about the risk of transmission of fire blight bacterium	Japan–Apples (US)	Neven and Weiler (2006)
China export quotas on certain rare earths and raw materials allegedly to conserve natural resources	China–Raw Materials (EU, US, Mexico) China–Rare Earths (EU, Japan, US)	Bronckers and Maskus (2014) and Bond and Trachtman (2016)
US Clean Air Act rule to differentially treat imported and domestic gasoline for air pollution prevention	US–Gasoline (Brazil, Venezuela)	
Russia older motor vehicle recycling fee promoting purchase of environmentally friendly autos	Russia–Motor Vehicles (EU, Japan)	
Labor regulations		
Guatemala failure to enforce its own labor laws related to the right of association, the right to organize and bargain collectively, and acceptable conditions of work	Guatemala–Issues Relating to the Obligations Under Article 16.2.1(a) of the CAFTA-DR (US)[a]	

[a]Not a WTO dispute, as the US dispute against Guatemala was adjudicated under the Central American Free Trade Agreement Dominican Republic (CAFTA-DR).
Constructed by the authors.

scrutiny, we must caveat that one should not conclude that import protection through BTB policies is thus more likely to arise in these particular countries and sectors. In a final section later, we return to these and other caveats regarding the interpretation of these results given sample selection bias due to the endogeneity of the dispute settlement process, as well as how the trade restrictiveness of BTB policies also interacts with levels of import protection through border barriers.

5.1 Behind-the-Border Policies Affecting Supply

This section introduces a number of domestic policies that primarily affect the supply side of the market— either by lowering domestic firms' costs or by raising a foreign rival's costs by potentially forcing them to undertake additional investment to meet a standard or regulation.

Table 10 Disputed behind-the-border policies predominantly affecting demand, 1995–2015

Behind the border policy	WTO dispute (complaining countries)	Legal-economic research
Subsidies/taxes		
Canada, Chile, Japan, Korea, and Philippines each with domestic tax regime discriminating in favor of locally-produced alcohol relative to foreign-produced varieties: • Canada (wine and beer) • Chile (pisco) • Japan (sochu) • Korea (soju) • Philippines (distilled spirits)	Canada–Tax Exemptions and Reductions for Wine and Beer (EC) Chile–Alcoholic Beverages (EC, US) Japan–Alcoholic Beverages II (Canada, EC, US) Korea–Alcoholic Beverages (EC, US) Philippines–Distilled Spirits (EC, US)	Neven and Trachtman (2013)
Foreign investment and local content requirements		
Brazil, Canada, China, India, Indonesia, and Philippines regulations in the auto sector with local content requirements	Brazil–Certain Automotive Investment Measures (EU, Japan, US) Indonesia–Autos (EU, Japan, US) Canada–Autos (Japan) India–Autos (EU, US) Philippines–Motor Vehicles (US) China–Auto Parts (Canada, EU, US)	Bagwell and Sykes (2005b) and Wauters and Vandenbussche (2010)
Canada regulations for renewable energy generation and local content requirements	Canada–Renewable Energy (Japan)	Charnovitz and Fischer (2015) and Rubini (2015)
EU regulations for renewable energy generation and local content requirements, subsidies for solar energy consumption	EU–Certain Measures Affecting the Renewable Energy Generation Sector (China)	
China Special Fund for Industrialization of Wind Power Equipment and contingencies for local content requirements	China–Measures concerning wind power equipment (US) US–Countervailing Measures (China)[a]	Brewster et al. (2016)
India Jawaharlal Nehru National Solar Mission for solar cells and solar modules and local content requirements	India–Solar Cells (US)	

[a]indicates dispute concerned the trading partner's countervailing duty trade policy response to the subsidy and not the underlying subsidy itself.
Constructed by the authors.

Table 11 Other disputed behind-the-border policies predominantly affecting demand, 1995–2015

Behind the border policy	WTO Dispute (Complaining Countries)	Legal-economic research
Public health, consumer safety, and product standards		
EU import measures on food and agricultural products containing genetically modified organisms (GMOs)	EU–Approval and Marketing of Biotech Products (US, Argentina, Canada)	Howse and Horn (2009)
US Family Smoking Prevention Tobacco Control Act of 2009 that bans most all flavored cigarettes (like cloves) but not menthol	US–Clove Cigarettes (Indonesia)	Howse and Levy (2013) and Broude and Levy (2014)
US regulations and federal laws banning cross-border internet gambling, such as the Wire Act, Travel Act, and the Illegal Gambling Business Act	US–Gambling (Antigua and Barbuda)	Irwin and Weiler (2008)
France import measures on asbestos	EU–Asbestos (Canada)	Horn and Weiler (2003)
US import measures on Mexico's commercial trucking services due to public health and safety concerns	US–Cross-Border Trucking Services (Mexico)[a]	
EU import measures on hormone-treated beef (precautionary principle)	EU–Hormones (Canada, US)	
Korea import measures and additional testing requirements on agricultural products from Japan after Fukushima nuclear event	Korea–Radionuclides (Japan)	
Consumer product labeling and intellectual property rights		
US dolphin-safe tuna labeling	US–Tuna II (Mexico)	Howse and Levy (2013) and Crowley and Howse (2014)
US country of origin labeling (COOL) requirement for the tracking of cows and pigs (and beef and pork) intended for the US market along the global supply chain	US–COOL (Canada, Mexico)	Howse and Levy (2013) and Mavroidis and Saggi (2014)
EU regulation related to the protection of geographical indications and designations of origin on agricultural products and foodstuffs	EU–Trademarks and Geographical Indications (Australia, US)	
Australia laws and regulations that impose restrictions on trademarks, geographical indications, and other plain packaging requirements on tobacco products	Australia–Tobacco Plain Packaging (Dominican Republic, Honduras, Indonesia, Ukraine)	

Constructed by the authors.
[a]not a WTO dispute, as Mexico dispute against the US adjudicated under NAFTA.

5.1.1 Domestic Subsidies: Aircraft, Agriculture, Semiconductors, and Clean Energy

We begin with examples of domestic subsidies impacting production. In some sectors, the subsidies could be motivated on efficiency grounds as designed to confront externalities, or imperfect markets; in others, the subsidies may only be motivated as a second-best form of income redistribution for a politically-motivated government with an incomplete set of policy instruments.

Domestic subsidies abound in the civil aircraft industry and date back to the GATT period and even arguably predate the eventual rivalry between US-based Boeing and Europe-based Airbus. Subsidies, tax exemptions, and other forms of policy intervention in this market have triggered attempts to design international rules since at least the 1970s.[cr]

Consider a production subsidy that a European government grants to Airbus. Such a subsidy increases domestic production in Europe and, all else equal, leads to a decrease in European imports of aircraft from Boeing. In 2004, the US government filed a WTO dispute over European subsidy policies. Table 8 indicates that the EU filed a similar (and almost simultaneous) dispute challenging US subsidies to Boeing. Admittedly, the policies under dispute are much more complex than simple production subsidies; they include tax exemptions offered at the subfederal level (eg, by Washington state to Boeing); EU "launch-aid" to help overcome the start-up costs of developing new models; the civil aircraft subsidy spillovers arising from US government military contracts to Boeing, given that military aircraft technology has "dual use" (for civil aircraft) applications; and export-credit and guarantee arrangements offered to (consumer) airlines.

Civil aircraft subsidies can have additional strategic effects given the unique nature of the global duopoly; ie, the two producers not only compete for sales in each others' market, but for sales in third country markets.[cs] Table 8 indicates a very similar set of disputes has played out between Canada and Brazil in a separate segment of the civil aircraft market; each country challenged the other for subsidizing smaller aircraft (regional jet) producers Embraer and Bombardier, respectively. Finally, and while admittedly more of a demand-side policy, the United States recently challenged China with providing a subsidy (value-added tax exemption) for its domestically-produced aircraft.

Agriculture is another sector in which domestic subsidies frequently arise, albeit in different forms.[ct] The EU's Common Agricultural Policy has a long history of BTB

[cr] The GATT's Tokyo Round of negotiations produced a plurilateral code in 1979 that applied to international trade in civil aircraft.

[cs] The Boeing-Airbus storyline helped motivate the substantial strategic trade policy literature that arose in the 1980s; for a survey, see Brander (1995). Irwin and Pavcnik (2004) provide an empirical study of the Boeing-Airbus rivalry and policies of the 1990s.

[ct] Agriculture is perhaps the one sector for which there exists more systematic provision of data for a number of BTB policies. For example, the OECD has routinely produced a cross-country database on "producer and consumer support estimates" for agricultural support payments. Furthermore, Kym Anderson has worked with the World Bank to produce a historical database of distortions to agricultural incentives covering the period of 1955–2011 (Anderson and Nelgen, 2013). For a survey of the political economy of agricultural policy, see Anderson et al. (2013).

policies sparking disputes; one example was its domestic price support system for sugar. Australia, Brazil, and Thailand—other major exporters of sugar—ultimately challenged EU subsidies that had transformed it from a net importer to a net exporter of sugar, with the excess supply dumped onto export markets. Similarly, US agricultural policy, and various iterations of the US Farm Bill legislation in particular, has also been subject to considerable international scrutiny. For example, in 2002 Brazil brought a formal WTO dispute against US cotton subsidies. In both the EU and US disputes, the complaining countries' concerns with the subsidy were less over their impact for lost sales to the policy-imposing country's own market, and instead for lost sales competing with EU sugar or US cotton exports in third country markets.

Two additional industries—semiconductors and clean energy products—further highlight the complexities of subsidies arising as part of national industrial policies.

Semiconductors have been subject to considerable government intervention since at least the 1980s; indeed, our discussion of border barriers in the last section illustrated the industry as one in which antidumping and VERs were prevalent between the United States and Japan.[cu] More recently a leading Korean producer, Hynix, which accounted for 4% of *total* Korean exports globally, became financially insolvent. In October 2001 and again in December 2002, Hynix's creditors organized financial bail-outs designed to save the company. The United States, EU and Japan, major importers and producers of semiconductors at the time, each asserted that the Korean government had subsidized the industry by orchestrating the bailouts, and they then each responded by imposing countervailing duties on Korean semiconductor exports to their markets.

This kind of dispute introduces another channel through which BTB policies can be impacted by WTO legal decisions; this is due to a particular way that certain areas of the WTO Agreements are structured. While the primary "policy" triggering the friction between the United States, EU, Japan and Korea was Korea's (BTB) subsidy, the subject of the WTO dispute was the United States and Japanese countervailing duty policies in *response* to the Hynix bailout; not the bailout itself. In this kind of a dispute, for example, the WTO could not rule that Korea should reform its subsidy policy, it could, at most, direct the United States or Japan to reform how their countervailing duty policies addressed the Korean subsidy (Hynix bailout) policy. However, any adjustments to the rules for when it is permissible for a trading partner to implement countervailing duties would be expected to *indirectly* affect how a country like Korea implements its subsidy policies in the first place.

Finally, recent disputes over BTB policies have arisen in a number of interrelated markets for clean energy products. Here, we describe solar panels, though similar

[cu] Irwin and Klenow (1994) provide an empirical study of the semiconductor industry and learning-by-doing spillovers over the 1974–92 period.

BTB policies are affecting markets for wind towers and wind turbines.[cv] Solar panels are potentially distinct from a number of other sectors in that their *consumption*—ie, a shift toward clean energy production and away from more polluting fossil fuels—may be associated with positive externalities that may even be global in scope, considering climate change. Beginning in 1999, European governments implemented consumption subsidies to stimulate demand for solar energy resulting in an increase in solar generating capacity; for example, in Germany by 2014, installed solar capacity was larger than natural gas, hard coal, and brown coal (Burger, 2014).

Although the European consumption subsidy was partially intended to benefit the German firms instrumental in the technological development of solar panels, by 2012, China's solar panel exporters had captured 80% of the European market. This prompted new EU import restrictions of solar panels from China under its antidumping policy. In essence, the *nondiscriminatory* nature of the original European consumption subsidies helped trigger such an increase in imports that the EU government came under political pressure to apply new border barriers.

The effect of the European policies has spilled over into other countries' policies and into upstream (input) markets. First, the Chinese government responded to the decline in exports to the EU by implementing its own BTB policies, including by introducing a regulation to force industry consolidation in 2013 as well as a program of consumption subsidies. Second, China also adjusted its border policies by imposing antidumping duties on imports of solar grade polysilicon—a key input for solar panel production—from the United States, EU and Korea beginning in 2013. Third, the United States also adjusted its border policies in the solar panel market when a subsidiary of a German firm, Solar World AG, filed a series of TTB cases against imports from China and Taiwan (but not Germany) beginning in 2011; they have subsequently resulted in the United States imposing new antidumping and countervailing duties against these countries.[cw] Finally, there has also been a WTO dispute over solar panels, though it only indirectly concerns the underlying Chinese BTB policy. Similar to the semiconductors example, China filed a WTO dispute over the US applied countervailing duty that was the policy response to the Chinese subsidies.

These last examples in particular raise a host of questions for research on the design of international institutions to coordinate BTB policy actions that might address various types of market failures, as well as local and global, nonpecuniary externalities, including climate change.

[cv] This section draws from Crowley and Song (2015). Cosar et al. (2015) provide an empirical study of the European wind turbine industry.

[cw] India also initiated an antidumping investigation into imported solar cells from China, Taiwan, United States and Malaysia in 2012.

5.1.2 Other Supply-Side Policies: Competition, Production Standards, Environment and Labor

Next turn to Table 9, which provides examples of other supply-side policies subject to WTO dispute. The public policy motive behind these policies are frequently even more complex than subsidies; furthermore, the manner by which these BTB policies potentially discriminate between domestic and foreign-produced varieties can also be much more subtle.

First, a number of WTO disputes have arisen in the area of competition policy, perhaps partly because there is no agreement fully articulating the scope of international cooperation for antitrust authorities. The United States has used the WTO to file disputes against Canada, Japan, and China, for example, and in each case one of the key allegations was that US producers were unable to sell their products to foreign consumers because of bottlenecks in the distribution networks arising from excessive domestic market power. The United States alleged that the concentration of the domestic industry resulted in discrimination against US exports of wheat, photographic film (Kodak), and audio-visual products (Hollywood movies), respectively. On the other hand, Russia has challenged the EU's attempts at "unbundling" vertically integrated providers of natural gas and electricity that would expectedly change the market structure facing energy service providers and which might *increase* the level of competition.

Another increasingly contentious area of domestic policy involves production process standards. Consider, for example, India's set of import restrictions on US poultry products; the policy was motivated out of the concern that the existence of the avian influenza (AI) virus in the US would affect the US process of producing poultry and thus result (through trade) in the virus being transmitted to India's domestic poultry industry. The main US allegation was that India's import ban on US poultry products was being justified by the application of domestic standards that were "too restrictive" in light of *international* scientific standards.

As this example illustrates, a key aspect of the BTB policies over standards is the regulatory *justification*—ie, scientific evidence, public health concern, or even ethical or moral outrage— behind the policy *application*; ie, the policy application frequently takes the form of a blunt import ban (thus arising through a *border* policy). It is typical for foreign suppliers to allege that such standards are either too restrictive (in light of scientific evidence) or are applied in a way that discriminates against foreign relative to domestic production, potentially by forcing them to undertake additional costly investment to meet compliance requirements.[cx] Thus, any process by which to evaluate whether

[cx] Staiger and Sykes (2011) provide a model in order to show how a government may have an incentive to "over-regulate"—ie, impose standards that while nondiscriminatory are nevertheless "too high" from a global perspective—because it can shift some of the costs of those standards onto trading partners by reducing their terms of trade.

a domestic standard is too restrictive mandates a commonly accepted benchmark for purposes of comparison.

The WTO system has outsourced this benchmarking to scientists organized under international standards-setting agencies; for the case of food safety to Codex Alimentarius, for animal health (eg, the AI-example above) to the World Animal Health Organization (OIE), and for plant health to the International Plant Protection Convention (IPPC). Table 9 documents a number of disputes arising in these areas, including over animal health and safety standards; in addition to the Indian AI-policies on poultry, similar thematic disputes have taken place over US policies on beef (related to foot and mouth and disease in Argentina), Korean policies on beef (related to mad cow disease in Canada), and Russian policies on pork (related to African Swine Fever in the EU).

The WTO has considered challenges to a number of other environment-related policies that also affect production processes or standards. One example is the US mandate that wild-caught shrimp must use nets that protect endangered sea turtles from being caught inadvertently. The EU had its ban on imports of seal products challenged by Canada and Norway; one of the claims of the exporters was that the EU policy was applied in a discriminatory manner because it exempted certain EU-based producers (indigenous communities) of seal products. Finally, one of the very first disputes filed with the WTO involved Brazil and Venezuela challenging provisions of the US Clean Air Act as requiring different standards for imported vs domestically-produced gasoline.

Finally, the United States has also initiated a dispute over a trading partner's domestic labor market policies. The United States alleged that Guatemala was not enforcing its own labor laws regarding unionization, collective bargaining, and work conditions for workers in major export sectors, including shipping, apparel, steel and agriculture.[cy] To date, labor standards disputes remain relatively rare; indeed, this particular dispute was not initiated under the WTO, which does not include labor provisions, but under a free trade agreement that does contain such provisions.

5.2 BTB Policies Affecting Demand

We next turn to case studies of demand-side policies that can also have a trade-restricting effect, typically of negatively impacting imports.

5.2.1 Taxes, Foreign Investment Measures, and Local Content Requirements

The most straightforward example of a demand-side, behind-the-border policy is a domestic consumption tax that discriminates by incentivizing consumption of local varieties relative to consumption of imported varieties of substitute goods.

[cy] This is an example, however, in which the domestic policy is being challenged because it is lowering domestic firms' costs (in industries that export to the United States) and not raising foreign firms' costs (in US industries attempting to export to Guatemala).

A relatively common theme for a WTO dispute has involved alcohol, and the allegation that governments impose discriminatory consumption taxes on different varieties. The lower tax on the domestic variety stimulates demand facing the domestic industry relative to the taxed foreign variety; specific examples listed in Table 10 include beer and wine in Canada, pisco in Chile, sochu in Japan, soju in Korea, or distilled spirits in the Philippines. The government defense typically attempts to justify the tax differential by claiming that its locally-produced variety is not a "like product" or a "directly competitive or substitutable product" relative to the imported varieties.

A second and more subtle example of an indirect consumption tax commonly arises through regulations to foreign direct investment; governments frequently create tax incentives for such investment that are *conditional* on local content requirements being met. As Table 10 indicates, automobiles are a common sector in which countries attempt to encourage foreign investment but also mandate local content requirements. The policy is typically structured so that the government incentivizes (with subsidies or other general tax exemptions) foreign automakers to establish a local production facility, and the preferential tax treatment is applied conditional on the resulting local production of autos containing sufficient domestic content (eg, locally produced auto parts). Some of the effect of the foreign investment subsidy is then passed on—via the local content requirement—to indirectly subsidize consumption of locally-produced inputs relative to foreign-produced inputs (Bagwell and Sykes, 2005b). In the auto sector alone, the EU, Japan, and the United States have brought disputes against at least six other WTO members (Brazil, Canada, China, India, Indonesia, and Philippines) with foreign investment regimes alleged to contain local content requirements.

More recently, the renewable energy sector—eg, wind turbines and towers, solar panels—has also faced a number of WTO challenges to foreign direct investment regulations for their inclusion of local content requirements. The allegation is that such requirements artificially stimulate demand for locally-sourced inputs and upstream industries and thus discriminate against imported inputs. Examples from these sectors include regulations imposed by Canada, the EU, China, and India and disputes brought by Japan, China and the United States.[cz]

5.2.2 Other Demand Policies: Consumer Safety, Product Labeling, and IPRs

Table 11 presents our final examples of potentially trade-restricting demand-side policies, including product standards for consumer safety, consumer product labeling, trademarks, and other regulations related to intellectual property rights (IPRs) enforcement.

Consumer product safety standards are similar to the production standards described earlier, in that foreign exporters typically allege that the standard is either too restrictive,

[cz] Some of these disputes also concern the consumption subsidies and other BTB policies described earlier in the market for solar panels.

and not justified in light of scientific evidence and international standards, or it is being applied in a manner than discriminates against imports. Perhaps the highest-profile examples of such disputed policies are the EU's "Frankenstein food" regulations applied to hormone-treated beef and to food and agricultural products containing genetically modified organisms (GMOs). The United States and other countries appealed to the lack of scientific evidence supporting EU attempts to justify these policies through the "precautionary principle," or that the long-term effects of such product characteristics on human, animal, and plant health, as well as the environment, were unknown. As indicated earlier, the WTO relies on Codex Alimentarius as the international organization in charge of establishing scientific standards for food safety; as such, its standards play an important benchmarking role against which to compare any country's chosen level of domestic standards.

Table 11 indicates a number of other countries have also faced challenges to their public health policies on consumer safety standards. There have been WTO challenges to the US bans on clove cigarettes, Internet gambling, and Mexican commercial trucking services. Japan has also challenged Korea's restrictions on imported agricultural products after the Fukushima nuclear incident.

Foreign exporters are increasingly challenging consumer product labels by alleging that the label increases demand for the domestic variety at the expense of foreign varieties. The consumer labels sometimes arise from a domestic legal requirement regarding a consumer's "right to know," and often mandate that firms provide information about certain product attributes. Furthermore, the schemes can be mandatory or voluntary.

Failure to satisfy the mandatory labeling requirements means a product cannot be sold. Discrimination against foreign products could arise, for example, if it is more costly to label imported products. Table 11 documents how Mexico and Canada recently challenged a US country of origin labeling (COOL) scheme that required cows and pigs, as well as the resulting beef and pork products, be traceable to their source country. The allegation was that the US policy discriminated against imported inputs by imposing additional costs on US meatpackers that sourced cows and pigs (as inputs) from Mexico or Canada.

Under a voluntary scheme, a good can still be sold if it fails to satisfy a label's requirements, it is simply that demand may collapse if the label is informative about some minimum threshold for a product attribute. As an example, Mexico used the WTO to challenge a US law which enforced a voluntary labeling scheme for "dolphin safe" canned tuna by arguing that the label reduced demand for the Mexican variety and thus discriminated against Mexican exports.

Finally, some consumer labels have been challenged in disputes over IPRs, but the underlying issue is essentially the same—a label shifts demand for a foreign, imported product in a way that hurts its producer. Cases regarding "geographical indicators" are similar to mandatory and voluntary labeling; the alleged intent is to increase demand

for one variety of a good (eg, cheese from Parma, Italy) and reduce demand for other varieties (a similar-tasting cheese made in the United States). Australia and the US challenged EU efforts to establish geographical indicators or trademarks for a number of its agricultural products—parmesan cheese, feta cheese, kalamata olives, etc.—based on where the product originated. In another case, Australia attempted to reduce consumer demand for all varieties of cigarettes by requiring plain packaging on cigarette boxes. The exporters claimed that the Australian public health policy had reduced the value of their intellectual property; ie, the value of their trademark was reduced due to the regulation *limiting* the ability of cigarette makers to differentiate their product through labeling.

5.3 Final Caveats on BTB Policies

Our case studies highlight a number of the complexities that researchers inevitably face in bringing scrutiny to bear on BTB policies. These include attempts to disentangle which elements of BTB policies are potentially "legitimate"—from a global, efficiency-enhancing perspective in light of the relevant market failures—from "illegitimate" elements that result in mainly (uncompensated) cost-shifting or profit-shifting across countries. We conclude with a brief discussion of some of the limitations of our approach.

First, a discussion of hand-picked case studies is certain to be fraught with sample selection concerns.[da] For example, most of the disputes over BTB policies have arisen in large and disproportionately high-income economies with democratic political systems in which policies are developed (and applied) under conditions of relative transparency (Canada, EU, United States, Japan, etc.). Furthermore, these economies also have relatively low levels of tariffs (see again Section 2); this raises the question of whether the BTB policy under scrutiny was there all along, and only worth challenging once the border barriers had first been liberalized, or whether the BTB policy only arose after the border barrier was dismantled.[db]

Second, we have attempted in our analysis to refrain from passing judgment on any particular BTB policy; ie, our selection of BTB policies should not be construed as a commentary on their trade restrictiveness or on any particular WTO legal decision. Indeed, a close read of more than 20 years and 100 WTO legal decisions indicates a surefire tension that has arisen but which also speaks again to the complexities involved in research in this area. On one hand, the WTO's Dispute Settlement Body (DSB) almost never questions

[da] An example of research examining the specific trade concerns (STCs) that governments have brought to the WTO under the SPS or TBT committees is Fontagné et al. (2015). More generally, Bown (2009, chapters 3 and 4) surveys the early research on some determinants of which policies governments choose to challenge under the WTO, and also finds that high-income countries are mostly behind the challenges to BTB policies.

[db] Another limitation of our approach is that it does not attempt to provide even a cross-section of imposed BTB policies in existence at any moment in time—ie, some of the BTB policies highlighted here may no longer be in effect. See also the survey and compilation of policies provided in WTO (2012).

the legitimacy of the respondent country's underlying domestic policy under dispute; ie, the WTO approach seems to respect national sovereignty and its member governments' right to regulate to address market failures and externalities. On the other hand, in almost every dispute, the DSB also finds that the respondent country has done something fundamentally wrong via the manner though which it has *applied* its BTB policy.

6. CONCLUSION

We have presented a portrait of the complexity of international commercial policy as of 2013–14 and have provided answers to some of our chapter's fundamental questions regarding variation in the levels of import protection in place today—across countries, within countries across sectors, over time, and vis-à-vis different trading partners in a discriminatory manner. However, most of our main questions remain only partially answered. The inability of the current literature to completely assess these questions—especially with respect to the overall restrictiveness of policy, but also with respect to the trade restrictiveness of the "newest" policies of interest that are behind-the-border—provides an opportunity. Indeed, with increasing access to policy data, a long-term research agenda directed toward an improved understanding of trade policy is not only likely to bear fruit scientifically, but it is also likely to result in large societal payoffs.

Before concluding, we take the opportunity to suggest additional ways through which these newly available policy data sources may improve our understanding of other areas of the international economy.

Over the last decade, empirical research on firms engaged in international trade has exploded. This includes firms involved in multicountry production through foreign direct investment, and in cross-border production structures and global supply chains. Scholars have provided a sound understanding of many of the differences between manufacturing firms that operate domestically and those that engage globally.

However, while these firm-level studies are informed by a wealth of data on the destinations for their outputs, origin of inputs, prices, quantities, worker matching, revenues, debts, firm-to-firm relations, etc.—they most often treat the policy environment as an afterthought. The richness of changes in the trade policy barriers, which we have documented result in considerable heterogeneity over time, across destinations, and products, are typically swept up in these studies into an economy-wide trade cost or a product-specific fixed effect.

Furthermore, there have also been substantial developments in empirical research into firm-pricing behavior (domestically and internationally), the importance of the relationship between the parties in international trade transactions, and the extent to which exchange rates pass through into transaction-level prices. This literature has deepened our understanding of the substantial differences in the prices of tradeable goods across borders. However, very little research on product-specific trade policy changes—many

of which have magnitudes that dwarf the annual changes to exchange rates—has been undertaken in a way that would inform our understanding of the remaining pricing puzzles.

The fact that fewer than 20% of manufacturing firms in major economies export anything to anyone suggests that policy barriers to trade continue to matter. Similarly, increasingly disaggregated, high-frequency data on the prices of traded goods indicates that cross border price differences remain sizeable. Is there more that can be learned by incorporating similarly detailed trade policy data into microeconomic studies of firms and international pricing? Our hope is that this chapter sparks research ideas about how to take advantage of the rich variation in policy data to learn more about these other important questions facing the global economy.

To wrap up our analysis, we make a final, more practical, point regarding the increasing availability of trade policy data. Although a wealth of policy data is now almost continuously becoming available, because these data are still relatively new, in many instances, the data are not yet "clean." Thus working with such data will require researchers to make some human capital investment into the details of the policies themselves so that they can check and verify the accuracy of newer datasets. A basic knowledge of trade agreements and the relevant domestic institutions is extremely helpful to understand the structure of data reporting and the potential substitutability of policy tools. In our view, the opportunities provided by this newfound data availability far outweigh the costs of this one-time investment.

To assist economists embarking on research in trade policy, we include two additional resources. First, we provide a Data Appendix with an in-depth description of the underlying sources for the data that we utilize in our empirical exercises. Second, and as our discussion of the landscape of trade policy has revealed, a large amount of policy data is collected and referred to by distinct GATT legal provisions that are known as "Articles." For ease of reference, in Table A.3, we provide a summary which links each of the key GATT Articles that we have utilized in the chapter to the main economic policies, exceptions, or concepts that they address.

A. DATA APPENDIX

This section introduces the main sources of the underlying data sets for the various trade policy instruments that we have utilized in the empirical analysis.

A.1 Tariff Data

In Section 2 we first utilized data on product-level MFN tariffs. These data arise from a number of different sources, including the WTO's Integrated Database (IDB), WTO's Consolidated Tariff Schedules (CTS), UNCTAD's Trade Analysis Information System (TRAINS) database, as well as from the International Trade Centre (ITC)

in Geneva. In some instances, the ITC may be the first source of the raw data (even if it is ultimately attributed to UNCTAD/TRAINS), as one UN agency sends it to another for further cleaning and processing before making it available to the public. Data on WTO tariff binding commitments is made available through WTO's CTS; these bindings are essentially unchanged since the negotiation of the Uruguay Round in 1995, with the exception of new accession countries for whom binding rates were established at the date of their accession. Data from each of the other sources is on MFN *applied* rates.

In terms of the classification, it is important to note that the Harmonised System only began in 1988 and was slowly adopted by countries starting thereafter. As such, a common product-level classification scheme across countries—an important necessary condition for meaningful construction of clean measures for simple average tariffs, for example—is only potentially available beginning in 1988. Next, the "products" in these data series are only comparable across countries at the 6-digit Harmonised System (HS06) level, and there are roughly 5200 HS06 products in existence at any moment in time.[dc] These tariff data are also frequently available at the "tariff-line" level—eg, 8-digit, 10-digit, etc.—ie, under the national customs authority's own scheme for how it chooses to differentiate product varieties beyond the HS06 level, over which it has authority. To the extent that data are reported at the HS06 level, they have been averaged from the underlying level in some way, typically as a simple average.

The tariff data from the WTO, UNCTAD, and the ITC has been made freely available to the public over the last few years through a consortium arrangement that also includes the World Bank and the wing of the United Nations statistical division that collects and reports commodity-level trade data. In addition to financial support, the World Bank's substantive contribution to the arrangement has been to develop and provide technical support and an on-line software platform called World Integrated Trade Solution (WITS) for public dissemination of the data. To be clear, the World Bank's WITS is not the underlying source for any of the data—it is merely the platform by which the data has been made available from the WTO, UNCTAD or ITC to the general public.[dd] WITS makes available on its website a user's manual that provides details on

[dc] Revisions to the Harmonized System, affecting upwards of 200 products each time, were undertaken in 1996, 2002, 2007, and 2012.

[dd] One concern with the current, decentralized arrangement is whether it creates the right incentive structure to make and implement fixes of importance to scholars; eg, when users discover data problems in historical data. That is, typically the World Bank (WITS) is not in a position to fix the publicly provided data because it did not collect the data in the first place. Furthermore, because these UN agencies (and even the WTO) have both tight budget constraints (for data production) and whose mandate is more focused on contemporary policy rather than historical policy—even if by "history," we are referring to only 2 or 3 years in the past—they may not face the proper incentives to bear the costs of implementing major fixes to the historical data that may be incomplete or incorrect.

the underlying sources of data, the descriptions of the different types of policy data made available, as well as other useful information. Through the arrangement, WITS also provides HS06 level bilateral import and export data that is collected by UN Comtrade. Furthermore, in recent years, the WTO, UNCTAD and the ITC have made varying efforts to release the raw data directly to the public via their own websites as well.

The raw data from the WTO and ITC typically do not contain information on estimated ad valorem equivalents for all of the tariffs applied as specific duties that we analyze in Section 2.2. In the data sets made available through WITS, UNCTAD has undertaken efforts to construct ad valorem equivalent estimates for the tariffs imposed as specific duties. At least four different calculations for the AVEs are provided, each based on a different methodology. However, these data are not as comprehensively available as the raw data. In some years, for example, they are completely missing. Furthermore, their values will expectedly vary significantly over time, of course, due to changes in prices, even when the applied tariff policies themselves have not changed.

The Section 2 analysis relied on preferential tariff data that was also, for the most part, collected by the ITC and UNCTAD. That data is also typically made publicly available through WITS, and in many instances, UNCTAD will compute AVE estimates for the products with preferential tariffs applied as specific duties. However, it has been our experience that the raw preferential tariff data made available in WITS is much more problematic—in terms of comprehensiveness of coverage—than the applied MFN tariff data. For example, in certain years no preferential tariff data may be available for an entire country. In other years, some, but not all, of a country's preferential tariffs will be recorded. Clearly these data need to be cleaned by researchers and cross-validated against other external sources (at a minimum, which catalog the existence of preferential trade agreements, such as WTO, 2015c,a). Much of the preferential tariff data that we utilize in this chapter for the year 2014 was actually acquired directly from ITC.

We repeat here three important points made in the chapter regarding the MFN and preferential applied tariff data in particular. First, the applied tariffs are those that governments set, and our measure derive from either what a government reports (to the WTO, for applied MFN rates) or which these UN agencies collect and compile from official government sources, and typically these are reported on an annual basis. Furthermore, the applied tariff data does *not* include other border charges or taxes, including safeguards tariffs and antidumping duties. (To the extent that these are applied in a particular context, they would need to be added onto the existing level of the applied MFN or bilateral tariff.) Second, throughout the chapter and for consistency, the statistics that we report utilize simple averaging for the tariffs; the alternative of constructing trade-weighted average tariffs can lead to the well-known problem of downward bias due to products with high tariffs receiving low weights (because of small import

Table A.1 Industry classification used in the analysis

Acronym	Industry	Harmonized System 2-digit (HS02) Sections
ANIM	Animal products, live animals	01–05
VEGE	Vegetable products	06–15
FOOD	Prepared foodstuffs, beverages, spirits, vinegar, tobacco products, edible fats	16–24
MINE	Mineral products	25–26
FUEL	Mineral fuels	27
CHEM	Chemicals	28–38
PLAS	Plastics and rubber	39–40
HIDE	Hides, skins, leather, etc	41–43
WOOD	Wood and articles of wood, pulp and paper	44–49
TEXT	Textiles, fibers, apparel, etc.	50–63
FOOT	Footwear, headgear, umbrellas, feathers, etc	64–67
STON	Stone, cement, plaster, ceramics, glassware, pearls, etc	68–71
META	Base metals and articles of base metal	72–83
MACH	Machinery, mechanical appliances, electrical equipment	84–85
TRAN	Transportation: vehicles, aircraft, vessels	86–89
MISC	Miscellaneous	90–97

volumes). Third, sometimes the underlying data that we utilize to construct measures of average tariffs (eg, at the country or sector level) may utilize ad valorem equivalent estimates for products over which the import tariff that the country applies is a specific duty. In other instances it may not; as we indicated in the chapter, our decision of whether or not to include them depended on the context.

A.2 Temporary Trade Barriers (Antidumping, Safeguards, and Countervailing Duties) Data

The analysis of temporary trade barriers in Section 3.1 is based on the data collected annually and made publicly available through the World Bank's Temporary Trade Barriers Database (Bown, 2014a). The data was first made freely available to the public over the Internet in 2005; since 2009, it has been updated at least at the annual frequency.[de]

[de] Bown (2011a) provides a discussion of its use during the 2008–10 crisis, during 2009–10 it was updated and released on a quarterly basis. The project was conceived in the early 2000s because countries reported so little information about their temporary trade barriers use to the WTO, that it was insufficiently detailed for research purposes. Yet governments did report the information publicly, through official publications; this only required collating the information from national sources into a common format.

The Temporary Trade Barriers Database website also posts a complete users manual describing the data sources and all of the available variables utilized here and others made available (but not utilized here).

The raw data on antidumping and countervailing duties in the Temporary Trade Barriers Database are collected directly from official government sources; ie, it is important to note that these are not based on what countries report to the WTO. As such, the database includes much additional detail that the WTO has historically been unable to provide—because it relies on self-reporting by members—including product-level tariff codes for products subject to the policies, the dates of key aspects of the investigations (initiation, preliminary decisions, final decisions, policies imposed, and policies removed wherever possible), the trading partners investigated, the type of border barrier imposed (ad valorem duty, specific duty, price undertaking, etc) as well as its level. Finally, and where available, the database also includes information on the domestic firms, industry associations, or labor groups behind the petition initiating the investigation, and it also has firm-specific trade barriers for the foreign firms (and their names) when cases result in different levels of the new barriers applying to different firms within the same country.

Finally, the information on the use of safeguards compiled into the Temporary Trade Barriers Database is gathered from information on what government's report to the WTO Committee on Safeguards. Under this particular policy, governments have been mandated to report sufficiently detailed information on the HS codes associated with their product-level trade restrictions, as well as the other key pieces of information, including exemptions for trading partners excluded from application of the policy. The safeguards policy is distinct from the WTO's reporting requirements for antidumping and countervailing duties.

A.3 Historical Data from the GATT Archives

Data on the GATT-era (1947–94) use of safeguards (Article XIX), antidumping (Article VI), and import restrictions related to balance of payments difficulties (Article XII) were compiled from information in hundreds of documents housed in the Stanford GATT digital archive. The selection of years for the figures presented was driven by the availability of reports in the digital archive. Notably, documents for different policy instruments in several decades have yet to be uploaded to the archive.

The archive organizes documents according to the nomenclature that was used by the GATT. Thus, work of the Committee on Anti-Dumping Practices is reported in a series beginning COM.AD, work of the Committee on Government Procurement is reported in a series beginning GPR, etc. Somewhat confusingly, some document series

include reports on a wide array of issues. At the same time, some policies are reported in multiple document series and it appears that there is no overlap; ie, if a tariff increase is reported in one series, the same increase does not appear to be reported in other series.

The information on antidumping described in Section 4.3.6 was collected from a series of approximately 270 documents reported by the GATT's Committee on Anti-Dumping Practices between 1970 and 1979. During this period, the Committee issued 86 basic documents/reports, but with various addendum included. Periodic reports issued by this committee include lists of all countries that reported antidumping activity in the relevant period, the trading partners affected by the antidumping case, verbal descriptions of the products involved, and information about provisional and final antidumping measures imposed. In some cases, countries have reported the removal of duties, the termination of investigations that did not result in duties, and the outcomes of negotiated settlements like price undertakings. We then concorded these verbal product descriptions to modern HS product classifications. While the information is similar to what is reported to the WTO in the modern era, it appears to be less systematically reported. Moreover, it does not include information on values of trade, prices of goods, or magnitude of antidumping duties.

Information on safeguards (Article XIX) for 1950–59 utilized in Section 4.2 is reported in the L: General Series (Limited Distribution) and the GATT/CP series. In this period, there are almost 1500 individual documents in the L: series and over 900 individual documents in the GATT: series. Only a small fraction of these documents relate to Article XIX actions so significant effort must go into identifying the relevant documents for Article XIX and then extracting the information contained in the documents. As with antidumping, we recorded data on the country imposing the measure, the product(s) involved, that date the investigation began, and the final policy outcome.

Information on changes in import restrictions to address BOP problems used in Section 4.3.1 is also reported in the L: General Series. From these reports, we recorded the country imposing the measures and the date of implementation. These reports also include long lists of products whose importation has been banned or restricted in an effort to reduce the country's trade deficit.

Finally, we recorded data on permanent renegotiations of tariff rates under Article XXVIII that were reported in the L: General Series between 1950 and 1959. However, we do not report this information in the chapter because this series of reports seems to cover only a small subset of all Article XXVIII actions. In particular, *GATT Analytical Index* (WTO, 1995) provides summary information on actions taken by countries during the period 1947–94 and indicates that most Article XXVIII renegotiations were recorded in a series of documents classified as SECRET. The SECRET document series is not (currently) included in the GATT Digital Archive.

Table A.2 Country classification used in the analysis

Acronym	Country	Acronym	Country	Acronym	Country
ARG	Argentina	IDN	Indonesia	RUS	Russia
AUS	Australia	IND	India	SAU	Saudi Arabia
BGD	Bangladesh	IRN	Iran	THA	Thailand
BRA	Brazil	JPN	Japan	TUR	Turkey
CAN	Canada	KEN	Kenya	TZA	Tanzania
CHN	China	KOR	Korea	UKR	Ukraine
COD	DR Congo	MEX	Mexico	USA	United States
COL	Colombia	MMR	Burma	VNM	Vietnam
EGY	Egypt	NGA	Nigeria	ZAF	South Africa
ETH	Ethiopia	PAK	Pakistan		
EUN	European Union	PHL	Philippines		

Table A.3 Topics of major GATT articles and WTO agreements

GATT 1947 (article)	Topic	WTO agreements (in addition to GATT 1947)
Article I	Most-favored nation (MFN) treatment of nondiscrimination across trading partners	
Article II	Tariff binding commitment submissions (schedule of concessions)	
Article III	National treatment (nondiscrimination between domestic and foreign-produced goods in terms of domestic policies)	
Article XX	General exceptions (for domestic policies)	Agreement on Sanitary and Phytosanitary (SPS) Measures Agreement on Technical Barriers to Trade (TBT)
Article VI	Antidumping and Countervailing Duties	Agreement on Antidumping
Article XVI	Granting of Subsidies	Agreement on Subsidies and Countervailing Measures
Article XI	Elimination of Quantitative Restrictions	
Article XII	Exceptions to protect the Balance of Payments	
Article XVIII	Special and differential treatment for developing countries	
Article XIX	Temporary safeguards/escape clause (protection for particular products)	Agreement on Safeguards
Article XXII	Dispute settlement procedures	Dispute Settlement Understanding (DSU)
Article XXIII		
Article XXIV	MFN exception for customs unions and free-trade areas	
Article XXV	Other waivers of GATT provisions	
Article XXVIII	Permanent renegotiation of tariffs	
Article XXXV	Non-application of the entire agreement between particular countries	

Constructed by the authors.

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REFERENCES

Anderson, J.E., Neary, J., 1992. Trade reform with quotas, partial rent retention, and tariffs. Econometrica 60 (1), 57–76.

Anderson, J.E., Neary, J., 1996. A new approach to evaluating trade policy. Rev. Econ. Stud. 63 (1), 107–125.

Anderson, J.E., van Wincoop, E., 2004. Trade costs. J. Econ. Lit. 42 (3), 691–751.

Anderson, K., Nelgen, S., 2013. Updated national and global estimates of distortions to agricultural incentives, 1955 to 2011. The World Bank. Available from: http://www.worldbank.org/agdistortions.

Anderson, K., Rausser, G., Swinnen, J., 2013. Political economy of public policies: insights from distortions to agricultural and food markets. J. Econ. Lit. 51 (2), 423–477.

Bagwell, K., Staiger, R.W., 1990. A theory of managed trade. Am. Econ. Rev. 80 (4), 779–795.

Bagwell, K., Staiger, R.W., 1999. An economic theory of GATT. Am. Econ. Rev. 89 (1), 215–248.

Bagwell, K., Staiger, R.W., 2001. Domestic policies, national sovereignty and international economic institutions. Q. J. Econ. 116 (2), 519–562.

Bagwell, K., Staiger, R.W., 2003. Protection and the business cycle. Adv. Econ. Anal. Policy. 3 (1). Article 3.

Bagwell, K., Staiger, R.W., 2011. What do trade negotiators negotiate about? Empirical evidence from the World Trade Organization. Am. Econ. Rev. 101 (4), 1238–1273.

Bagwell, K., Staiger, R.W., 2014. Can the Doha round be a development round? Setting a place at the table. In: Feenstra, R.C., Taylor, A.M. (Eds.), Globalization in an Age of Crisis: Multilateral Economic Cooperation in the Twenty-First Century. University of Chicago Press for the NBER, Chicago, IL, pp. 91–124.

Bagwell, K., Sykes, A.O., 2005a. Chile–Price band system and safeguard measures relating to certain agricultural products. In: Horn, H., Mavroidis, P.C. (Eds.), The WTO Case Law of 2002. Cambridge University Press, Cambridge, UK.

Bagwell, K., Sykes, A.O., 2005b. India–Measures affecting the automotive sector. In: Horn, H., Mavroidis, P.C. (Eds.), The WTO Case Law of 2002. Cambridge University Press, Cambridge, UK.

Bagwell, K., Staiger, R.W., Yurukoglu, A., 2015. Multilateral trade bargaining: a first look at the GATT bargaining records. NBER Working Paper No. 21488.

Bagwell, K., Bown, C.P., Staiger, R.W., 2016. Is the WTO passé? J. Econ. Lit.

Baier, S.L., Bergstrand, J.H., 2004. Economic determinants of free trade agreements. J. Int. Econ. 64 (1), 29–63.

Baier, S.L., Bergstrand, J.H., Mariutto, R., 2014. Economic determinants of free trade agreements revisited: distinguishing sources of interdependence. Rev. Int. Econ. 22 (1), 31–58.

Baldwin, R., 1985. The Political Economy of US Import Policy. The MIT Press, Cambridge, MA, USA.

Baunsgaard, T., Keen, M., 2010. Tax revenue and (or?) trade liberalization. J. Public Econ. 94 (9-10), 563–577.

Bernard, A.B., Jensen, J., Redding, S.J., Schott, P.K., 2007. Firms in international trade. J. Econ. Perspect. 21 (3), 105–130.

Berry, S., Levinsohn, J., Pakes, A., 1999. Voluntary export restraints on automobiles: evaluating a trade policy. Am. Econ. Rev. 89 (3), 400–430.
Beshkar, M., Bond, E.W., 2016. The escape clause in trade agreements. In: Bagwell, K., Staiger, R.W. (Eds.), The Handbook of Commercial Policy, vol. 1B. Elsevier, Netherlands, pp. 69–106.
Beshkar, M., Bond, E.W., Rho, Y., 2015. Tariff binding and overhang: theory and evidence. J. Int. Econ. 97 (1), 1–13.
Bhagwati, J., 1965. On the equivalence of tariffs and quotas. In: Baldwin, R.E., Bhagwati, J., Caves, R.E., Johnson, H.G. (Eds.), In Trade, Growth and the Balance of Payments: Essays in Honor of G. Haberler. Rand McNally, Chicago.
Bhagwati, J., 1991. The World Trading System at Risk. Princeton University Press, Princeton.
Blanchard, E.J., Hakobyan, S., 2015. The US generalised system of preferences in principle and practice. World Econ. 38 (3), 399–424.
Blanchard, E.J., Matschke, X., 2015. U.S. multinationals and preferential market access. Rev. Econ. Stat. 97 (4), 839–854.
Blanchard, E.J., Bown, C.P., Johnson, R.C., 2016. Global supply chains and trade policy. NBER Working Paper No. 21883.
Blonigen, B.A., Prusa, T.J., 2016. Dumping and antidumping duties. In: Bagwell, K., Staiger, R.W. (Eds.), The Handbook of Commercial Policy, vol. 1B. Elsevier, Netherlands, pp. 107–159.
Blonigen, B.A., Liebman, B.H., Pierce, J.R., Wilson, W.W., 2013. Are all trade protection policies created equal? Empirical evidence for nonequivalent market power effects of tariffs and quotas. J. Int. Econ. 89 (2), 369–378.
Bohara, A.K., Kaempfer, W.H., 1991. A test of tariff endogeneity in the United States. Am. Econ. Rev. 81 (4), 952–960.
Bond, E.W., Trachtman, J.P., 2016. China-Rare earths: export restrictions and the limits of textual interpretation. World Trade Rev. 15 (2), 189–209.
Bown, C.P., 2002a. The economics of trade disputes, the GATT's Article XXIII and the WTO's Dispute Settlement Understanding. Econ. Polit. 14 (3), 283–323.
Bown, C.P., 2002b. Why are safeguards under the WTO so unpopular? World Trade Rev. 1 (1), 47–62.
Bown, C.P., 2004. Trade disputes and the implementation of protection under the GATT: an empirical assessment. J. Int. Econ. 62 (2), 263–294.
Bown, C.P., 2009. Self-Enforcing Trade: Developing Countries and WTO Dispute Settlement. Brookings Institution Press, Washington, DC.
Bown, C.P., 2010. China's WTO entry: antidumping, safeguards, and dispute settlement. In: Feenstra, R. C., Wei, S.J. (Eds.), China's Growing Role in World Trade. University of Chicago Press for the NBER, Chicago, IL, pp. 281–337.
Bown, C.P., 2011a. Introduction. In: Bown, C.P. (Ed.), The Great Recession and Import Protection: The Role of Temporary Trade Barriers. CEPR and World Bank, London, UK, pp. 1–51.
Bown, C.P., 2011b. Taking stock of antidumping, safeguards and countervailing duties, 1990-2009. World Econ. 34 (12), 1955–1998.
Bown, C.P., 2013a. Emerging economies and the emergence of south-south protectionism. J. World Trade 47 (1), 1–44.
Bown, C.P., 2013b. How different are safeguards from antidumping? Evidence from U.S. trade policies toward steel. Rev. Ind. Organ. 42 (4), 449–481.
Bown, C.P., 2014a. Temporary trade barriers database. The World Bank. Available from: http://econ.worldbank.org/ttbd/ (accessed 25.07.14).
Bown, C.P., 2014b. Trade policy flexibilities and Turkey: tariffs, antidumping, safeguards, and WTO dispute settlement. World Econ. 37 (2), 193–218.
Bown, C.P., 2015. What's left for the WTO? CEPR Discussion Paper No. 11003.
Bown, C.P., Crowley, M.A., 2010. China's export growth and the China safeguard: threats to the world trading system? Can. J. Econ. 43 (4), 1353–1388.
Bown, C.P., Crowley, M.A., 2013a. Import protection, business cycles, and exchange rates: evidence from the Great Recession. J. Int. Econ. 90 (1), 50–64.
Bown, C.P., Crowley, M.A., 2013b. Self-enforcing trade agreements: evidence from time-varying trade policy. Am. Econ. Rev. 103 (2), 1071–1090.

Bown, C.P., Crowley, M.A., 2014. Emerging economies, trade policy, and macroeconomic shocks. J. Dev. Econ. 111, 261–273.
Bown, C.P., Hillman, J.A., 2016. Bird flu, the OIE, and national regulation: a legal-economic assessment of India–Agricultural products. World Trade Rev. 15 (2), 235–257.
Bown, C.P., Irwin, D.A., 2015. The GATT's starting point: tariff levels circa 1947. NBER Working Paper No. 21782.
Bown, C.P., McCulloch, R., 2003. Nondiscrimination and the WTO Agreement on Safeguards. World Trade Rev. 2 (3), 327–348.
Bown, C.P., McCulloch, R., 2009. U.S.-Japan and U.S.-China trade conflict: export growth, reciprocity, and the international trading system. J. Asian Econ. 20 (6), 669–687.
Bown, C.P., Pauwelyn, J., (Eds.) 2010. The Law, Economics and Politics of Retaliation in WTO Dispute Settlement. Cambridge University Press, Cambridge, UK.
Bown, C.P., Reynolds, K.M., 2015. Trade flows and trade disputes. Rev. Int. Organ. 10 (2), 145–177.
Bown, C.P., Tovar, P., 2011. Trade liberalization, antidumping, and safeguards: evidence from India's tariff reform. J. Dev. Econ. 96 (1), 115–125.
Bown, C.P., Trachtman, J.P., 2009. Brazil–Measures affecting imports of retreaded tyres: a balancing act. World Trade Rev. 8 (1), 85–135.
Bown, C.P., Karacaovali, B., Tovar, P., 2015. What do we know about preferential trade agreements and temporary trade barriers? In: Dür, A., Elsig, M. (Eds.), Trade Cooperation: The Purpose, Design and Effects of Preferential Trade Agreements. Cambridge University Press, Cambridge, UK, pp. 433–462.
Brambilla, I., Khandelwal, A.K., Schott, P.K., 2010. China's experience under the multi-fiber arrangement (MFA) and the agreement on textiles and clothing (ATC). In: Feenstra, R.C., Wei, S.J. (Eds.), China's Growing Role in World Trade. University of Chicago Press for the NBER, Chicago, IL, pp. 345–387.
Brander, J., 1995. Strategic trade policy. In: Grossman, G.M., Rogoff, K. (Eds.), Handbook of International Economics. North Holland, Amsterdam.
Brandt, L., Morrow, P.M., 2015. Tariffs and the Organization of Trade in China. University of Toronto, Mimeogr.
Brewster, R., Brunel, C., Mayda, A.M., 2016. Trade in environmental goods: a review of the WTO appellate bodys ruling in US–Countervailing measures (China). World Trade Rev. 15 (2), 327–349.
Broda, C., Limão, N., Weinstein, D.E., 2008. Optimal tariffs and market power: the evidence. Am. Econ. Rev. 98 (5), 2032–2065.
Bronckers, M., Maskus, K.E., 2014. China–Raw materials: a controversial step towards evenhanded exploitation of natural resources. World Trade Rev. 13 (2), 393–408.
Broude, T., Levy, P.I., 2014. Do you mind if I don't smoke? Products, purpose and indeterminacy in US–Measures affecting the production and sale of clove cigarettes. World Trade Rev. 13 (2), 357–392.
Burger, B., 2014. Electricity production from solar and wind in Germany in 2014. Mimeogr.
Butler, R.A., 1952. The balance of payments situation. Chancellor of the exchequer, cabinet memo c(52) 10 (top secret), 19th January. Available from: http://www.nationalarchives.gov.uk.
Calvo-Pardo, H., Freund, C., Ornelas, E., 2011. The ASEAN free trade agreement: impact on trade flows and external trade barriers. In: Barro, R.J., Lee, J.W. (Eds.), Costs and Benefits of Economic Integration in Asia. Oxford University Press, Oxford, UK, pp. 157–186.
Cassing, J., McKeown, T.J., Ochs, J., 1986. The political economy of the tariff cycle. Am. Polit. Sci. Rev. 80 (3), 843–862.
Charnovitz, S., Fischer, C., 2015. Canada–Renewable energy: implications for WTO law on green and not-so-green subsidies. World Trade Rev. 14 (2), 177–210.
Charnovitz, S., Hoekman, B.M., 2013. US-Tyres: upholding a WTO accession contract–imposing pain for little gain. World Trade Rev. 12 (2), 273–296.
Conconi, P., Pauwelyn, J., 2011. Trading cultures: appellate body report on China–Audiovisuals (WT/DS363/AB/R, adopted 19 January 2010). World Trade Rev. 10 (1), 95–118.
Conconi, P., Voon, T., 2016. EC–Seal products: the tension between public morals and international trade agreements. World Trade Rev. 15 (2), 211–234.
Cosar, A.K., Grieco, P.L.E., Tintelnot, F., 2015. Borders, geography, and oligopoly: evidence from the wind turbine industry. Rev. Econ. Stat. 97 (3), 623–637.

Crowley, M.A., Howse, R., 2014. Tuna-Dolphin II: a legal and economic analysis of the Appellate Body report. World Trade Rev. 13 (2), 321–355.
Crowley, M.A., Palmeter, D., 2009. Japan–Countervailing duties on dynamic random access memories from Korea. World Trade Rev. 8 (1), 259–272.
Crowley, M.A., Song, H., 2015. Policy Shocks and Stock Market Returns: Evidence from Chinese Solar Panels. University of Cambridge, Mimeogr.
Crowley, M.A., Song, H., Meng, N., 2016. Tariff Scares: Trade Policy Information and the Extensive Margin of Chinese Exporting Firms. University of Cambridge, Mimeogr.
Crucini, M.J., 1994. Sources of variation in real tariff rates: the United States, 1900-1940. Am. Econ. Rev. 84 (3), 732–743.
Curzon, G., 1965. Multilateral Commercial Diplomacy: The General Agreement on Tariffs and Trade and Its Impact on National Commercial Policies and Techniques. Michael Joseph, London.
Dean, J., 1995. Market disruption and the incidence of VERs under the MFA. Rev. Econ. Stat. 77 (2), 383–388.
Delipalla, S., Keen, M., 1992. The comparison between ad valorem and specific taxation under imperfect competition. J. Public Econ. 49 (3), 351–367.
Djankov, S., Freund, C., Pham, C.S., 2010. Trading on time. Rev. Econ. Stat. 92 (1), 166–173.
Eaton, J., Kortum, S., Kramarz, F., 2011. An anatomy of international trade: evidence from French firms. Econometrica 79 (5), 1453–1498.
Ederington, J., Ruta, M., 2016. Nontariff measures and the world trading system. In: Bagwell, K., Staiger, R.W. (Eds.), The Handbook of Commercial Policy, vol. 1B. Elsevier, Netherlands, pp. 211–277.
Edmonds, E.V., Pavcnik, N., Topalova, P., 2010. Trade adjustment and human capital investments: evidence from Indian tariff reform. Am. Econ. J.: Appl. Econ. 2 (4), 42–75.
Edwards, L., 2011. South Africa: from proliferation to moderation. In: Bown, C.P. (Ed.), The Great Recession and Import Protection: The Role of Temporary Trade Barriers. CEPR and World Bank, London, UK, pp. 429–469.
Estevadordal, A., Freund, C., Ornelas, E., 2008. Does regionalism affect trade liberalization toward nonmembers? Q. J. Econ. 123 (4), 1531–1575.
Feenstra, R.C., 1988. Quality change under trade restraints in Japanese autos. Q. J. Econ. 103 (1), 131–146.
Feenstra, R.C., 1995. Estimating the effects of trade policy. In: Grossman, G.M., Rogoff, K. (Eds.), Handbook of International Economics, vol. 3. North Holland, Amterdam, pp. 1553–1595.
Foletti, L., Fugazza, M., Nicita, A., Olarreaga, M., 2011. Smoke in the (tariff) water. World Econ. 34 (2), 248–264.
Fontagné, L., Orefice, G., Piermartini, R., Rocha, N., 2015. Product standards and margins of trade: firm-level evidence. J. Int. Econ. 97 (1), 29–44.
Francois, J., Palmeter, D., 2008. US-countervailing duty investigation of DRAMS. World Trade Rev. 7 (1), 219–229.
Gawande, K., Bandyopadhyay, U., 2000. Is protection for sale? Evidence on the Grossman-Helpman theory of endogenous protection. Rev. Econ. Stat. 82 (1), 139–215.
Gawande, K., Krishna, P., Robbins, M.J., 2006. Foreign lobbies and U.S. trade policy. Rev. Econ. Stat. 88 (3), 563–571.
Gawande, K., Krishna, P., Olarreaga, M., 2009. What governments maximize and why: the view from trade. Int. Organ. 63 (3), 491–532.
Gawande, K., Hoekman, B.M., Cui, Y., 2015. Global supply chains and trade policy responses to the 2008 crisis. World Bank Econ. Rev. 29 (1), 102–128.
Goldberg, P.K., 1995. Product differentiation and oligopoly in international markets: the case of the U.S. automobile industry. Econometrica 63 (4), 891–951.
Goldberg, P.K., Maggi, G., 1999. Protection for sale: an empirical investigation. Am. Econ. Rev. 89 (5), 1135–1155.
Goldberg, P.K., Pavcnik, N., 2016. The effects of trade policy. In: Bagwell, K., Staiger, R.W. (Eds.), The Handbook of Commercial Policy, vol. 1A. Elsevier, Netherlands, pp. 161–206.
Goldberg, P.K., Khandelwal, A.K., Pavcnik, N., Topalova, P., 2010a. Imported intermediate inputs and domestic product growth: evidence from India. Q. J. Econ. 125 (4), 1727–1767.

Goldberg, P.K., Khandelwal, A.K., Pavcnik, N., Topalova, P., 2010b. Multiproduct firms and product turnover in the developing world: evidence from India. Rev. Econ. Stat. 92 (4), 1042–1049.
Grossman, G.M., Helpman, E., 1994. Protection for sale. Am. Econ. Rev. 84 (4), 833–850.
Hahn, M., Mehta, K., 2013. Its a bird, its a plane: some remarks on the Airbus Appellate Body Report (EC and Certain Member States–Large Civil Aircraft, WT/DS316/AB/R). World Trade Rev. 12 (2), 139–161.
Hakobyan, S., 2015. Accounting for underutilization of trade preference programs: the US Generalized System of Preferences. Can. J. Econ. 48 (2), 408–436.
Handley, K., 2014. Exporting under trade policy uncertainty: theory and evidence. J. Int. Econ. 94 (1), 50–66.
Handley, K., Limão, N., 2014. Policy Uncertainty, Trade and Welfare: Theory and Evidence for China and the U.S. University of Maryland, Mimeogr.
Handley, K., Limão, N., 2015. Trade and investment under policy uncertainty: theory and firm evidence. Am. Econ. J.: Econ. Policy 7 (4), 189–222.
Harrigan, J., Barrows, G., 2009. Testing the theory of trade policy: evidence from the abrupt end of the multifiber arrangement. Rev. Econ. Stat. 91 (2), 282–294.
Harris, R., 1985. Why voluntary export restraints are 'voluntary'. Can. J. Econ. 18 (4), 799–809.
Hoekman, B., Howse, R., 2008. EC–Sugar. World Trade Rev. 7 (1), 149–178.
Hoekman, B., Trachtman, J.P., 2008. Canada–Wheat: discrimination, non-commercial considerations, and the right to regulate through state trading enterprises. World Trade Rev. 7 (1), 45–66.
Hoekman, B.M., Kostecki, M.M., 2009. The Political Economy of the World Trading System: The WTO and Beyond. Oxford University Press, Oxford, UK.
Hoekman, B., Ng, F., Olarreaga, M., 2002. Eliminating excessive tariffs on exports of least developed countries. World Bank Econ. Rev. 16 (1), 1–21.
Hoekman, B., Ng, F., Olarreaga, M., 2004. Agricultural tariffs or subsidies: which are more important for developing economies? World Bank Econ. Rev. 18 (2), 175–204.
Horn, H., 2006. National treatment in the GATT. Am. Econ. Rev. 96 (1), 394–404.
Horn, H., Weiler, J.H.H., 2003. EC–Asbestos: European communities measures affecting asbestos and asbestos-containing products. In: Horn, H., Mavroidis, P.C. (Eds.), The WTO Case Law of 2001. Cambridge University Press, Cambridge, UK.
Howse, R., Levy, P.I., 2013. The TBT panels: US–Cloves, US–Tuna, US–COOL. World Trade Rev. 12 (2), 327–375.
Howse, R., Neven, D.J., 2003. US–Shrimp: United States–import prohibition of certain shrimp and shrimp products, recourse to article 21.5 of the DSU by Malaysia. In: Horn, H., Mavroidis, P.C. (Eds.), The WTO Case Law of 2001. Cambridge University Press, Cambridge, UK.
Howse, R., Neven, D.J., 2005a. Canada–Export credits and loan guarantees for regional aircraft (WT/DS222/R): a comment. In: Horn, H., Mavroidis, P.C. (Eds.), The WTO Case Law of 2002. Cambridge University Press, Cambridge, UK.
Howse, R., Neven, D.J., 2005b. United States–Tax treatment for 'Foreign Sales Corporations' recourse to arbitration by the United States under article 22.6 of the DSU and article 4.11 of the SCM agreement (WT/DS106/ARB): a comment. In: Horn, H., Mavroidis, P.C. (Eds.), The WTO Case Law of 2002. Cambridge University Press, Cambridge, UK.
Howse, R.L., Horn, H., 2009. European Communities—Measures affecting the approval and marketing of biotech products. World Trade Rev. 8 (1), 49–83.
Hudec, R.E., 1993. Enforcing International Trade Law: The Evolution of the Modern GATT Legal System. Butterworth Legal Publishers, New Hampshire.
Hummels, D., 2007. Transportation costs and international trade in the second era of globalization. J. Econ. Perspect. 21 (3), 131–154.
Irwin, D.A., 1998a. Change in U.S. tariffs: the role of import prices and commercial policies. Am. Econ. Rev. 88 (4), 1015–1026.
Irwin, D.A., 1998b. The Smoot-Hawley tariff: a quantitative assessment. Rev. Econ. Stat. 80 (2), 326–334.
Irwin, D.A., 2005. The rise of US anti-dumping activity in historical perspective. World Econ. 28 (5), 651–668.

Irwin, D.A., 2011. Peddling Protectionsim: Smoot-Hawley and the Great Depression. Princeton University Press, Princeton and Oxford.
Irwin, D.A., 2012. Trade Policy Disaster: Lessons from the 1930s. The MIT Press, Cambridge, MA.
Irwin, D.A., 2013. The Nixon Shock after 40 years: the import surcharge revisited. World Trade Rev. 12 (1), 29–66.
Irwin, D.A., Klenow, P.J., 1994. Learning-by-doing spillovers in the semiconductor industry. J. Polit. Econ. 102 (6), 1200–1227.
Irwin, D.A., Pavcnik, N., 2004. Airbus versus Boeing revisited: international competition in the aircraft market. J. Int. Econ. 64 (2), 223–245.
Irwin, D.A., Weiler, J., 2008. Measures affecting the cross-border supply of gambling and betting services (DS 285). World Trade Rev. 7 (1), 71–113.
Irwin, D.A., Mavroidis, P.C., Sykes, A.O., 2008. The Genesis of the GATT. Cambridge University Press, Cambridge, UK.
ITC, 2009. Export Promotion and the WTO: A Brief Guide. International Trade Centre, Geneva.
Javorcik, B., Narciso, G., 2008. Differentiated products and evasion of import tariffs. J. Int. Econ. 76 (2), 208–222.
Karacaovali, B., Limão, N., 2008. The clash of liberalizations: preferential vs. multilateral trade liberalization in the European Union. J. Int. Econ. 74 (2), 299–327.
Keck, A., Lendle, A., 2014. New Evidence on Preference Utilization. WTO, Mimeogr.
Kee, H.L., Neagu, C., Nicita, A., 2013. Is protectionism on the rise? Assessing national trade policies during the crisis of 2008. Rev. Econ. Stat. 95 (1), 342–346.
Kee, H.L., Nicita, A., Olarreaga, M., 2009. Estimating trade restrictiveness indices. Econ. J. 119 (534), 172–199.
Keen, M., 1998. The balance between specific and ad valorem taxation. Fisc. Stud. 19 (1), 1–37.
Keen, M., 2008. Vat, tariffs, and withholding: border taxes and informality in developing countries. J. Public Econ. 92 (2), 1892–1906.
Khandelwal, A.K., Schott, P.K., Wei, S.J., 2013. Trade liberalization and embedded institutional reform: evidence from Chinese exporters. Am. Econ. Rev. 103 (6), 2169–2195.
Knetter, M.M., Prusa, T.J., 2003. Macroeconomic factors and antidumping filings: evidence from four countries. J. Int. Econ. 61 (1), 1–17.
Krishna, K., 1989. Trade restrictions as facilitating practices. J. Int. Econ. 26 (3-4), 251–270.
Krishna, P., Mitra, D., 1998. Trade liberalization, market discipline and productivity growth: new evidence from India. J. Dev. Econ. 56 (2), 447–462.
Krueger, A.O., 1974. The political economy of the rent-seeking society. Am. Econ. Rev. 64 (3), 291–303.
Lee, G.M., 2016. Subsidies and countervailing duties. In: Bagwell, K., Staiger, R.W. (Eds.), The Handbook of Commercial Policy, vol. 1B. Elsevier, Netherlands, pp. 161–210.
Levy, P.I., Regan, D.H., 2015. EC–Seal products: seals and sensibilities (TBT aspects of the panel and appellate body reports). World Trade Rev. 14 (2), 337–339.
Limão, N., 2006. Preferential trade agreements as stumbling blocks for multilateral trade liberalization: evidence for the U.S. Am. Econ. Rev. 96 (3), 896–914.
Limão, N., 2007. Are preferential trade agreements with non-trade objectives a stumbling block for multilateral liberalization? Rev. Econ. Stud. 74 (3), 821–855.
Limão, N., 2016. Preferential trade agreements. In: Bagwell, K., Staiger, R.W. (Eds.), The Handbook of Commercial Policy, vol. 1B. Elsevier, Netherlands, pp. 279–367.
Limão, N., Tovar, P., 2011. Policy choice: theory and evidence from commitment via international trade agreements. J. Int. Econ. 85 (2), 186–205.
Ludema, R.D., Mayda, A.M., 2013. Do terms-of trade effects matter for trade agreements? Theory and evidence from WTO countries. Q. J. Econ. 128 (4), 1837–1893.
Madani, D., 1999. A review of the role and impact of export processing zones. World Bank Policy Research Working Paper No. 2238.
Maggi, G., 2014. International trade agreements. In: Gopinath, G., Helpman, E., Rogoff, K. (Eds.), Handbook of International Economics, vol. 4. Elevier, Amsterdam, NL, pp. 317–390.

Maggi, G., Rodriguez-Clare, A., 1998. The value of trade agreements in the presence of political pressures. J. Polit. Econ. 106 (3), 574–601.
Mattoo, A., Subramanian, A., 2009. From Doha to the next Bretton Woods: a new multilateral trade agenda. Foreign Aff. 88 (1), 15–26.
Mavroidis, P.C., 2016. Dispute settlement in the WTO: mind over matter. In: Bagwell, K., Staiger, R.W. (Eds.), Handbook of Commercial Policy, vol. 1A. Elsevier, Netherlands, pp. 333–377.
Mavroidis, P.C., Saggi, K., 2014. What is not so cool about US-COOL regulations? A critical analysis of the Appellate Body's ruling on US-COOL. World Trade Rev. 13 (2), 299–320.
McCulloch, R., Pinera, J., 1976. Trade as aid: the political economy of tariff preferences. Am. Econ. Rev. 67 (5), 959–967.
McLaren, J., 2016. The political economy of commercial policy. In: Bagwell, K., Staiger, R.W. (Eds.), The Handbook of Commercial Policy, vol. 1A. Elsevier, Netherlands, pp. 109–159.
Mishra, P., Subramanian, A., Topalova, P., 2008. Tariffs, enforcement, and customs evasion: evidence from India. J. Public Econ. 92 (10-11), 1907–1925.
Mitra, D., Thomakos, D.D., Ulubasoglu, M.A., 2002. 'Protection for sale' in a developing country: democracy vs. dictatorship. Rev. Econ. Stat. 84 (3), 497–508.
Neven, D., Sykes, A.O., 2014. United States–Measures affecting trade in large civil aircraft (second complaint): some comments. World Trade Rev. 13 (2), 281–298.
Neven, D., Trachtman, J.P., 2013. Philippines–Taxes on distilled spirits: like products and market definition. World Trade Rev. 12 (2), 297–326.
Neven, D., Weiler, J.H.H., 2006. Japan–Measures affecting the importation of apples (AB-2003-4): one bad apple? In: Horn, H., Mavroidis, P.C. (Eds.), The WTO Case Law of 2003. Cambridge University Press, Cambridge, UK.
Nicita, A., Olarreaga, M., Silva, P., 2014. Cooperation in WTO's Tariff Waters. University of Geneva, Mimeogr.
Ornelas, E., 2016. Special and differential treatment for developing countries. In: Bagwell, K., Staiger, R.W. (Eds.), The Handbook of Commercial Policy, vol. 1B. Elsevier, Netherlands, pp. 369–432.
Ossa, R., 2014. Trade wars and trade talks with data. Am. Econ. Rev. 104 (12), 4104–4146.
Palgrave Macmillan, 2013. International Historical Statistics. Available from: http://www.palgraveconnect.com/pc/doifinder/10.1057/9781137305688.0216 (accessed 17.09.15).
Panagariya, A., 1981. Quantitative restrictions in international trade under monopoly. J. Int. Econ. 11 (1), 15–31.
Panagariya, A., 1982. Tariff policy under monopoly in general equilibrium. Int. Econ. Rev. 23 (1), 143–156.
Prusa, T.J., 2008. Comment: US–Countervailing duty investigation of DRAMS. World Trade Rev. 7 (1), 231–234.
Ries, J.C., 1993. Windfall profits and vertical relationships: who gained in the Japanese auto industry from VERs? J. Ind. Econ. 41 (3), 259–276.
Rodrik, D., 1995. Political economy of trade policy. In: Grossman, G.M., Rogoff, K. (Eds.), Handbook of International Economics, vol. 3. North Holland, Amterdam, pp. 1457–1494.
Rose, A.K., 2013. The March of an economic idea? Protectionism isn't counter-cyclic (anymore). Econ. Policy 28 (76), 569–612.
Rubini, L., 2015. 'The wide and the narrow gate': benchmarking in the SCM agreement after the Canada–Renewable energy/FIT ruling. World Trade Rev. 14 (2), 211–237.
Saggi, K., Mark, W., 2016. Understanding agricultural price range systems as trade restraints: Peru–Agricultural products. World Trade Rev. 15 (2), 259–286.
Sapir, A., Trachtman, J.P., 2008. Subsidization, price suppression, and expertise: causation and precision in Upland Cotton. World Trade Rev. 7 (1), 183–209.
Schott, P.K., 2004. Across-product versus within-product specialization in international trade. Q. J. Econ. 119 (2), 646–677.
Staiger, R.W., 1995. International rules and institutions for trade policy. In: Grossman, G.M., Rogoff, K. (Eds.), Handbook of International Economics, vol. 3. North Holland, Amterdam, pp. 1495–1551.
Staiger, R.W., 2006. What can developing countries achieve in the WTO? J. Econ. Lit. 44 (2), 779–795.

Staiger, R.W., Sykes, A.O., 2010. 'Currency manipulation' and world trade. World Trade Rev. 9 (4), 583–627.
Staiger, R.W., Sykes, A.O., 2011. International trade, national treatment, and domestic regulation. J. Legal Stud. 40 (1), 149–203.
Subramanian, A., Wei, S.J., 2007. The WTO promotes trade, strongly but unevenly. J. Int. Econ. 72 (1), 151–175.
Topalova, P., Khandelwal, A., 2011. Trade liberalization and firm productivity: the case of India. Rev. Econ. Stat. 93 (3), 995–1009.
Tovar, P., 2012. Preferential trade agreements and unilateral liberalization: evidence from CAFTA. World Trade Rev. 11 (4), 591–619.
Trefler, D., 1993. Trade liberalization and the theory of endogenous protection: an econometric study of U.S. import policy. J. Polit. Econ. 101 (1), 138–160.
UK, 1952. Further (March 1952) reductions in United Kingdom external expenditure: memorandum by the government of the United Kingdom. GATT Digital Archive, L/2 20 March 1952.
USTR, 2012. U.S. Trade Representative Ron Kirk comments on presidential actions related to the Generalized System of Preferences. Available from: http://www.ustr.gov/about-us/press-office/press-releases/2012/march/us-trade-representative-ron-kirk-comments-presidenti (accessed 25.09.14).
Vandenbussche, H., Zanardi, M., 2008. What explains the proliferation of antidumping laws? Econ. Policy 23 (1), 93–138.
Viner, J., 1950. The Customs Union Issue. Carnegie Endowment for International Peace, New York.
Volpe, C.M., Carballo, J., Graziano, A., 2015. Customs. J. Int. Econ. 96 (1), 119–137.
Wauters, J.M., Vandenbussche, H., 2010. China-Measures affecting imports of automobile parts. World Trade Rev. 9 (1), 201–238.
WTO, 1995. Analytical Index: Guide to GATT Law and Practice, vols. 1 and 2. WTO, Geneva.
WTO, 2007. World Trade Report 2007: Six Decades of Multilateral Trade Cooperation: What Have We Learnt? WTO, Geneva.
WTO, 2011. World Trade Report 2011: The WTO and Preferential Trade Agreements: From Co-Existence to Coherence. WTO, Geneva.
WTO, 2012. World Trade Report 2012: Trade and Public Policies: A Closer Look at Non-Tariff Measures in the 21st Century. WTO, Geneva.
WTO, 2014. World Tariff Profiles 2014. Geneva, WTO, UNCTAD, and ITC.
WTO, 2015a. Database on preferential trade arrangements. Available from: http://ptadb.wto.org/default.aspx (accessed 30 December).
WTO, 2015b. Disputes by agreement. Available from: https://www.wto.org/english/tratop_e/dispu_e/dispu_agreements_index_e.htm (accessed 30 December).
WTO, 2015c. Regional trade agreements information system. Available from: http://rtais.wto.org/UI/PublicMaintainRTAHome.aspx (accessed 30 December).
Yu, M., 2015. Processing trade, tariff reductions and firm productivity: evidence from Chinese firms. Econ. J. 125, 943–988, 585.