WTO Tariff Commitments and Temporary Protection: Complements or Substitutes?

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Abstract

There is a long-held notion in the trade policy literature that traditional tariff instruments and temporary protection (TP) measures are substitutes. Despite this prediction, there is only mixed empirical evidence for a link between tariff reductions and the usage pattern of antidumping, safeguard and countervailing duties. Based on recent theoretical advances, I argue in this paper that the relevant trade policy margin for implementing TP measures is instead tariff overhangs, the difference between WTO bound and applied tariffs. Lower tariff overhangs constrain countries to raise their MFN applied rates without legal repercussions, independent of past tariff changes. Using detailed sectoral data for a sample of 30 WTO member countries during the period 1996-2014, I find strong evidence for an inverse link between tariff overhangs and TP activity. This result implies that tariff overhangs and TP measures are substitutes, vindicating the importance of existing tariff commitments as a key determinant of alternative protection instruments.

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1 Introduction

WTO tariff reductions over the years are thought to have come hand in hand with the increased application of non-tariff barriers and temporary protection (TP) in many advanced and developing WTO member countries (e.g., Bown 2011, Limão and Tovar 2011, and Beverelli et al. 2014), reversing in turn some of the agreement's welfare gains.[1] TP measures in the form of antidumping (AD), safeguard (SG) and countervailing duties (CVD) are thought to serve in many cases as 'safety valves' to satisfy domestic demands for trade barriers in key industries (Hoekman and Kostecki 2009).[2]

Empirical studies find, however, only mixed evidence for an inverse link between tariff reductions and TP activity. In probing this question, the existing literature distinguishes between bound tariffs —the WTO-negotiated maximum rates that countries could levy— and the tariffs they actually apply. Feinberg and Reynolds (2007) identify a substitution effect between bound tariff cuts and AD activity, but only in developing economies. Focusing on applied tariff reductions, Moore and Zanardi (2011) find that substitution effects are restricted to the even smaller subset of emerging economies that are heavy AD users. Importantly, none of the cross-country evidence registers an increase in TP activity after tariff cuts in advanced economies, which include some of the most active users of these measures.[3]

In this paper, I argue that sectoral tariff overhangs, the difference between WTO bound and applied tariffs, are instead the relevant indicator for countries who weigh their trade policy options in response to domestic political pressure. When applied tariffs are set close to their respective bound rates, countries cannot accommodate demands for additional protection by unilaterally adjusting their tariffs. Their only legal remedy is then to invoke the WTO agreement's legally sanctioned TP provisions. Hence, omitting the tariff overhang channel from the empirical analysis could lead to biased estimates for many of the previously suggested determinants of temporary protection, in particular tariff reductions.

Theoretical backing for this argument is provided by the cap-and-escape model in Beshkar and Bond (2017) who point out that a separate focus on either applied or bound tariffs misses key features of the WTO agreement. In their framework, non-observable time-varying political pressure

[1] The IMF (2016) documents that the worldwide share of products subject to temporary protection increased from 0.5 percent in 1990 to 2.5 percent in 2015.

[2] In essence, all three measures allow countries to temporarily apply tariffs in excess of their WTO commitments. AD duties target underpriced products, SG actions protect domestic industries in case of serious injury due to imports, and CVDs offset foreign subsidies. Sections 3 and 4 discuss these instruments in more detail.

[3] Focusing on detailed product level data in individual countries, Bown and Tovar (2011) and Ketterer (2016) find that tariff reductions have a positive impact on subsequent TP activity in India and the EU, respectively.

makes governments prefer the negotiation of bound tariffs with the potential availability of tariff overhangs.[4] If state verification costs are low enough, the allocated tariff overhang will always be zero and trade policy flexibility is only provided through TP measures. At the same time, if state verification costs are high, countries will negotiate positive levels of tariff overhang with less need for TP measures. The mechanism in Beshkar and Bond (2017) therefore predicts a negative relationship between tariff overhang and the incidence of TP activity, independent of past tariff reductions.[5]

A first look at the data for WTO members provides evidence for Beshkar and Bond's theoretical prediction that tariff overhangs and temporary protection measures are substitutes. Panel a) in Figure 1 shows that 6-digit HS sectors with a zero tariff overhang are nearly five times more likely to witness the initiation of a TP investigation in the subsequent year compared to sectors with a tariff overhang of more than 40 percentage points. A qualitatively similar pattern arises when I divide countries into high-, medium- and low-frequency users of TP measures in panels b) through d). In all cases, the probability to initiate a TP investigation is larger (smaller) for sectors with below (above) 40 percent tariff overhangs.

To complicate matters, however, tariff overhangs and TP measures could well be complements as the latter can be applied in a much more targeted fashion than MFN tariffs. That is, TP measures permit discriminatory protection by design. Blonigen and Prusa (2016) also make the point that AD duties (or SGs and CVDs) allow governments to establish a higher cost threshold for firms and other interest groups to exert political pressure for protection, which might increase the appeal of TP measures over MFN tariffs. Hence, while the stylized facts in Figure 1 and the theoretical channels are suggestive, a formal empirical analysis is required to determine if tighter sectoral WTO tariff commitments are a significant decision margin for TP activity. The present paper conducts this exercise.

To formally test whether tariff overhangs function as substitutes or complements for TP actions, I assemble a comprehensive sample of 30 WTO member countries from 1996 to 2014. Using 6-digit sectoral data, I juxtapose at an unprecedented level of detail the impact of tariff overhang pressures and other previously suggested determinants on TP activity. The analysis considers the most common range of TP measures that are invoked as safety valves by WTO members: AD, SG and CVD investigations. This paper therefore makes two major contributions to the literature. First, it

[4] For earlier papers explaining the presence of tariff overhangs, see Horn et al. (2010) and Bagwell and Staiger (2005).

[5] Beshkar and Bond (2017) also show that under an optimal agreement tariff overhang and temporary protection will not coexist. That is, when temporary protection is allowed, an optimal trade agreement will only grant positive tariff overhangs in sectors where an importer's actions have relatively little impact on world prices.

constitutes the first empirical analysis of sectoral tariff commitments on general TP activity that considers the relevant trade policy flexibility margin, tariff overhangs. Second, the dataset employed in this study improves on the existing empirical cross-country literature on TP determinants, both in terms of sectoral detail and country coverage.

The empirical evidence confirms that lower tariff overhangs are indeed significantly linked to TP activity across countries and sectors. Tighter WTO tariff commitments induce the usage of TP measures as substitutes to satisfy domestic protectionist demands when applied MFN tariffs cannot be raised. This result is robust across alternative empirical methodologies, and the negative link between tariff overhangs and TP usage is also not driven by sample selection issues, i.e., the presence of low- and high-frequency users of TP instruments.

Importantly, the inverse relationship between tariff overhangs and TP activity continues to persist after controlling for a host of other potential determinants. An extensive body of research explores the causes and consequences of TP measures, mostly with a focus on antidumping investigations.[6] In addition to the tariff policy channel discussed above, the existing explanations from cross-country studies can be grouped into four categories: (i) retaliatory motives, (ii) macroeconomic factors, (iii) political economy considerations, and (iv) import competition and terms-of-trade motivations. Tariff overhangs and TP activity retain their significant link even when accounting for all these factors.

The present paper adds to a growing literature that has started to analyze the inter-linkages between tariff overhangs and TP proceedings. Focusing on evidence at the country-pair level, Bown and Crowley (2014) find for a sample of 13 major developing economies that a rise in the share of products subject to WTO tariff constraints is associated with an increase in the number of TP measures.[7] However, Bown and Crowley do not attempt to relate actual tariff overhangs to the incidence of TP measures at the sectoral level. Busch and Pelc (2014) examine instead when countries are more likely to rely on temporary protection as opposed to raising MFN tariffs, but they do not associate tariff overhangs with the prevalence of TP activity itself. More recently, Beshkar and Bond (2016) provide suggestive evidence that sectors with lower tariff overhangs feature a larger number of safeguard actions. However, none of these studies systematically examines the relationship between WTO members' tariff setting flexibility at the sectoral level, as indicated by

[6] Section 2 offers a detailed discussion of this literature and its findings.

[7] Bown and Crowley (2013b) find no evidence that the same measure is significant in a sample of five advanced economies.

product-specific tariff overhangs, and the use of TP measures.[8] The analysis in this paper fills this void by considering sectoral tariff overhangs as a key constraint for countries when demands for additional import protection arise.

Beyond shedding light on TP activity across sectors, the findings in this paper can also help to explain the asymmetric use of the WTO dispute settlement mechanism by different members. Bown (2005), Shaffer (2003) and Beshkar and Majbouri (2019) document that poorer and smaller WTO members participate much less frequently in WTO dispute proceedings than their richer and larger counterparts, which raises questions of accessibility. The empirical evidence in this paper indicates that the design of the WTO itself is at least partly responsible for this outcome. As poorer and smaller economies are usually granted more policy flexibility through greater tariff overhangs (see Table 1), they are less likely to feel the need to implement TP measures that could result in a costly trade skirmish.

This argument is also in line with the work of Kuenzel (2017) who develops a theoretical link between tariff overhangs and TP actions in the context of WTO disputes. In his framework, after being subject to exogenous shocks, WTO members have an increased incentive to apply temporary protection or non-tariff barriers when their applied tariff is close to or at the bound tariff. If trading partners perceive at least some of these measures as unjustified, an inverse link should emerge between tariff overhangs and the incidence of WTO disputes, a prediction which is borne out by the data. When domestic demands for protection arise (e.g., due to productivity shocks, import surges or business cycle downturns), poorer countries are more likely to respond by using their tariff overhang space instead of having to resort to AD, CVD or SG proceedings. Hence, the results in this paper can rationalize why advanced economies tend to use both TP measures and the WTO dispute settlement mechanism more frequently than other countries.

The next section offers a detailed discussion of the theory and empirical evidence for the different channels that have been suggested as alternative determinants of TP measures. Section 3 introduces the empirical model and discusses the data. Section 4 provides empirical evidence for the link between tariff overhangs and TP proceedings, and section 5 considers several extensions of the baseline framework. Section 6 concludes.

[8] Focusing on the business cycle and tariffs, Lake and Linask (2016) provide product-level evidence that applied tariffs are higher in years when TP measures are in place but they do not consider tariff overhangs.

2 Temporary Protection Determinants

An extensive literature has emerged on the determinants of temporary protection, which refers to tariff barriers that are imposed for a limited time on specific goods and/or countries in excess of WTO-negotiated duties on imports. More specifically, as noted by Bown and Crowley (2013b, p. 51), TP measures are "the relatively substitutable import restrictions under antidumping, countervailing duty, global safeguards, and the China-specific safeguard policies." I follow this notion below, and use the term 'temporary protection' to include all of these measures. While the nature of AD, SG and CVD investigations is not always identical, they serve a common purpose: legally-sanctioned additional protection for specific products and industries that originate from certain countries.[9] This section first discusses the theoretical linkages between MFN tariffs and TP actions, and then examines additional determinants of TP proceedings that will be key components of the empirical analysis below.

2.1 Trade Policy

There is a widely accepted notion that constraining tariffs through trade agreements incentivizes countries to instead seek protection through unfair trade rules provisions and non-tariff barriers (NTBs). In a survey of the early literature on non-tariff measures, Baldwin (1984) notes that the application of unfair trade practices in the form of quantitative restrictions, subsidies and dumping has risen as governments have successfully lowered their tariffs through multilateral negotiations. Several theoretical explanations have been put forward to make sense of this phenomenon. Copeland (1990) argues that this substitution towards less efficient NTBs will emerge if loopholes exist in trade agreements due to non-negotiable trade barriers. Incomplete agreements which culminate in NTBs could, for instance, arise in the presence of uncertainty and asymmetric information (Hungerford 1991). Moreover, governments might be particularly inclined to substitute NTBs for tariffs if they value contributions from special interest groups (Yu 2000). The importance of domestic lobbying pressures is also emphasized by Limão and Tovar (2011) who show that governments have an incentive to use less efficient NTBs when tariff constraints serve as a commitment device toward special interest groups.

[9] Nevertheless, the majority of the TP literature focuses on antidumping investigations as AD cases tend to be observed more frequently due to a stricter burden of proof in SG and CVD proceedings.

Anderson and Schmitt (2003) take instead a more general approach and derive how the choice of a country's preferred trade policy instrument (tariff, quota, AD duty) varies with trade costs and the government welfare function. Focusing on the GATT/WTO environment, Bagwell and Staiger (2001) argue that, at least in theory, the WTO is well equipped to function as a forum to negotiate different levels of market access through a combination of tariffs and domestic NTBs. In fact, it is consensus by now that allowing for TP measures in the GATT/WTO is the most efficient means for countries to ensure the viability of these multilateral agreements in the first place (Ederington 2001 and Beshkar and Bond 2017). However, as noted in the introduction, most existing empirical studies on the topic only find mixed evidence that tariffs and TP measures are indeed interchangeable policy instruments.[10]

2.2 Retaliation

A growing strand of the literature analyzes to what extent TP activity is due to retaliatory or strategic motives. Focusing on Europe and the US, Maur (1998) first demonstrated the substantial correlation in the industry selection of AD actions across countries. Taking a more structured approach, subsequent studies empirically confirmed this pattern. Examining more countries and longer time series, Prusa and Skeath (2002, 2005), Feinberg and Reynolds (2006, 2008) and Bao and Qiu (2011) all find that tit-for-tat retaliation is a significant determinant of AD proceedings. Moreover, countries also have a tendency to target the same exporters and products with AD duties, a phenomenon known as "echoing." In the most recent analysis of antidumping echoing, Tabakis and Zanardi (2017a) document the importance of sequential AD actions at a previously unmatched sectoral level of detail (HS 4-digit). It follows from this line of research that countries, at least in part, use AD investigations and tariffs as potential deterrent to make future TP measures against their own exporters more costly.

2.3 Macroeconomic Factors

Several studies also suggest that macroeconomic factors have an impact on TP activity. Focusing on Australia, Canada, the EU and the US, Knetter and Prusa (2003) show that lower GDP growth and real exchange rate appreciations lead to more filings of AD petitions over the period 1980-1998.[11]

[10] There is also not much evidence for a reverse channel. Moore and Zanardi (2009) find no evidence that AD actions themselves induce more trade liberalization in a sample of developing countries. According to Kuczik and Reinhardt (2008), however, the presence of AD laws alone could be associated with lower WTO bound rates.

[11] In earlier work, Feinberg (1989) finds that US Dollar depreciations lead to more US firm filings that allege dumping

Examining the same set of countries plus South Korea from 1988 to 2010, Bown and Crowley (2013b) confirm the inverse relationship between all types of TP measures (AD, SG, CVD) and the business cycle of the importing as well as exporting countries. Bown and Crowley also find that exchange rate appreciations lead to more TP investigations. In a follow-up study, Bown and Crowley (2014) present similar evidence for an inverse relationship between macroeconomic shocks and TP restrictions in thirteen major emerging economies. Earlier work by Bown (2008) likewise identifies a significant relationship with negative macroeconomic shocks when confining the analysis to AD activity and developing economies. Aside from cross-country studies, a number of papers also link macroeconomic conditions to TP usage rates in individual countries; see Niels and Francois (2006) for Mexico and Crowley (2011) for the US.

2.4 Political Economy Motives

Starting with Finger et al. (1982), there is a rich earlier literature that focuses on the political economy of temporary protection and in particular antidumping activities across industries, mostly in the US context. Industry size and structure, poor performance and greater political leverage frequently emerge as significant determinants from these studies. Hansen (1990), for instance, identifies firm employment, pressure groups and the location of industries in districts of powerful politicians as AD petition and decision determinants. Hoekman and Leidy (1992) argue that the availability of TP measures in downstream industries might induce upstream firms to seek additional protection out of indirect rent-seeking behavior. Feinberg and Kaplan (1993) provide empirical evidence for this cascading effect of temporary protection in the US metal and chemical industries. Focusing on antidumping filings by US firms, Blonigen (2006) also finds evidence that prior experience with the temporary protection process leads to greater subsequent filing activity and a higher likelihood of affirmative decisions for firm petitions.

2.5 Import Surges and Terms-of-trade Effects

The last strand of the literature links TP activity to sectoral imports and terms-of-trade motives based on the ‘managed trade’ theory by Bagwell and Staiger (1990). Bagwell and Staiger suggest that countries have an incentive to implement additional protection during periods of import surges. Moreover, increases in trade barriers after import surges should lead to greater terms-of-trade gains

and/or foreign subsidies. However, as pointed out by Knetter and Prusa (2003), the theoretical link between exchange rates and the incentive to implement temporary protection is actually ambiguous.

in sectors with lower import demand and export supply elasticities, implying fewer distortions in the domestic economy after a tariff hike. Bown and Crowley (2013a) test this prediction with a focus on US import policy during 1997-2006 and indeed confirm a positive relation between import growth and the probability that the US imposes an AD tariff. Bown (2008) also offers empirical evidence that developing countries which face substantial import competition and more rapidly declining industry output are more active AD users.

However, in light of the above discussion on the counter-cyclical impact of macroeconomic factors on TP actions, the relation between import growth and the incidence of TP measures is not necessarily clear-cut. As business cycle downturns are associated with overall decreases in imports, it is also possible that import growth and TP activity are inversely linked. Examining data on monthly US sectoral imports, Hillberry and McCalman (2016) confirm this notion as they find that negative import demand shocks tend to directly precede the filing of AD petitions. Hence, depending on whether macroeconomic factors or trade policy considerations dominate, the impact of import growth on TP investigations is ambiguous.

In addition to the trade policy channels, the empirical analysis below will account for all TP determinants laid out in this part. The next section presents the empirical framework that allows us to juxtapose the impact of tariff overhangs and other factors on TP activity across countries and sectors over time.

3 Empirical Approach

To test whether tariff overhangs and TP measures are substitutes or complements, I implement two empirical strategies. First, a fixed effects logit model is employed to estimate the impact of sectoral tariff overhangs on the probability of the initiation of a TP investigation. Second, I use a linear probability model to examine the robustness of the findings from the logit estimation. The latter is crucial as the presence of many fixed effects can potentially induce biased marginal effect estimates in non-linear panel models; see Greene (2002, 2008) for a discussion. However, simulation studies also indicate that the bias is limited if the length of the panel is not too short (Katz 2001, Greene 2004, and Coupé 2005).

3.1 Model

As the main variable of interest, MFN tariff overhangs, varies by importer, year and sector, the empirical analysis focuses on the same aggregation level. For both the logit and linear probability models, I estimate the following baseline specification:

$$TP_{ict} = \beta Overhang_{ic,t-1} + \gamma Z_{ic,t-1} + \eta_s + \omega_{ct} + \epsilon_{ict} \tag{1}$$

where TP_{ict} is a binary variable that takes the value one if temporary protection proceedings are initiated in the 6-digit sector i in country c in year t, and zero otherwise.[12] The definition of TP proceedings includes AD, SG and CVD investigations. In place of TP investigations, I also consider below as dependent variable the incidence of actually implemented TP tariffs. The results are similar in both cases, which probably is not too surprising as 73 percent of the observed TP investigations in the sample eventually result in additional import barriers. The main variable of interest in specification (1) is the sectoral tariff overhang:

$$Overhang_{ic,t-1} = Tariff^{Bound}_{ic,t-1} - Tariff^{Applied}_{ic,t-1} \quad , \tag{2}$$

which captures the difference between a country's MFN bound and applied tariff rates at the 6-digit level in a given year. When a lower tariff overhang in sector i raises the likelihood to initiate TP proceedings for this product, then we should expect $\beta < 0$. In that case, TP measures would substitute for a rise in the MFN applied tariff. On the other hand, if β is not significantly different from zero or even positive, TP measures and MFN tariff overhangs rather function as complements. I use a continuous measure of tariff overhang to capture not only the impact of the pure existence but also the magnitude of trade policy space on TP actions. Figure 1 offers suggestive evidence that products with smaller tariff overhangs are much more likely to witness TP actions than products with more trade policy space. Note that in order to control for information delays, I include one period lagged values of all independent variables in the empirical model in equation (1).[13]

The vector Z contains a number of control variables that either could exert a direct impact on

[12] In section 5.4, I also consider count data models which exploit more of the underlying variation in the data. More specifically, I replace the dependent dummy variable in equation (1) with counts of the types of TP measures applied, the variety of products affected, and the number of exporters targeted.

[13] The tariff overhang estimates are similar when replacing the lagged value with either the maximum tariff overhang for a given product during the sample period or the contemporaneous tariff overhang. The same holds when using tariff overhang bins as in Table A1 in Appendix A. Detailed estimates are available upon request.

the initiation of TP proceedings or which have been shown to be determinants of tariff overhangs themselves. First and foremost, to capture import penetration and market power considerations, I include a country's sectoral imports in a given year (in logs), log(Imports$_{ict}$), and its sectoral share in world imports (in logs), log(WorldImportShare$_{ict}$). Moreover, I account in all specifications for the sectoral share of imports from a country's preferential trade agreement partners, PTAImportShare$_{ict}$, as MFN tariffs could be a less important margin for TP demands when most imports of a given product enter a nation on more beneficial terms. Countries might also be less willing to grant multilateral tariff concessions in sectors with a high share of imports from PTA partners. An additional reason to include these controls in the model is provided by Beshkar et al. (2015) who show that the latter two variables are significant determinants of tariff overhangs themselves.

Panels b) through d) in Figure 1 illustrate that high-frequency users have the highest TP activity by share in each tariff overhang category. At the same time, the aggregate pattern in panel a) seems to be mostly driven by high- and medium-frequency user countries of TP measures. To capture country-specific deviations from the aggregate TP activity pattern, it is then crucial for the model to include throughout country-year fixed effects, ω_{ct}, in the regression analysis. The country-year fixed effects can also absorb the impact of political instability, which Beshkar et al. (2015) emphasize to be another driver of tariff overhangs. In addition, they control for potential macroeconomic determinants of TP investigations, such as exchange rates and economic growth, as well as political economy considerations and other determinants that vary at the country-year level. To account for industry-specific drivers of demand for import protection, the estimations below also include 2-digit HS sector fixed effects, η_s.[14] Additional controls, in particular the TP determinants surveyed in the previous section, are discussed and introduced in passing below. However, while the analysis below makes every effort to control for the various determinants of tariff overhangs and TP activity itself, the caveat still applies that the tariff overhang estimates cannot be necessarily interpreted as causal.

3.2 Data

To examine the link between TP proceedings and tariff overhangs, I draw on information from two sources. Data on TP investigations come from the World Bank's Temporary Trade Barriers Database (Bown 2016). The TTBD database provides detailed information on initiated antidumping,

[14] The tariff overhang estimates are nearly identical in the linear probability model when including 4- or 6-digit fixed effects; see Table A2 in Appendix A for details. The additional computational complexity prevents the addition of too many fixed effects in the logit model.

safeguard and countervailing duty investigations. Most importantly, it contains country-specific information on the timing and in which sectors TP demands arise. In the empirical analysis below, I use information on all countries that can be matched to MFN bound and applied tariff rates from the World Bank's TRAINS database. The most detailed available data in TRAINS that consistently collects both bound and applied rates across countries is in 6-digit HS terms. I therefore aggregate the information in the TTBD database up to that level if the cited HS sector is available at a more disaggregate code (e.g., 8 or 10 digits). To create the tariff overhang variable at the 6-digit HS level, I subtract the applied MFN tariff rate from the MFN bound rate. In order to minimize the effect of outliers, I remove one percent of observations with the largest tariff overhangs, which restricts the sample to 6-digit sectors with a tariff overhang of 100 percent or less. The average sectoral tariff overhang in the final sample is 14.02 percent.[15] There is also substantial variation in tariff overhangs as indicated by the standard deviation of 15.00 percent. Appendix B lays out in more detail the construction of the tariff overhang and temporary protection variables.

Table 1 provides an overview of the total number of 6-digit HS sectors for each country in the sample, the corresponding count of sectors with at least one initiated TP investigation (differentiated by AD, SG and CVD measures), and the country-specific distribution of tariff overhangs across sectors. The empirical analysis below focuses on the time period 1996-2014 which constitutes the intersection between both the TRAINS tariff data and the available information on temporary protection proceedings in the TTBD database. The final dataset includes data on MFN tariff overhangs and temporary protection proceedings in 30 countries. Note that the variation in the included observations by country is mainly determined by two factors: the sectoral availability of MFN tariff and import data. Regarding the latter, the presence of $\log(\text{Imports}_{ict})$ and $\log(\text{WorldImportShare}_{ict})$ prevents the inclusion of sectors with zero imports.

Table 1 shows that the use of TP measures in the dataset varies substantially between countries, both in terms of quantity and the usage pattern across the different measures (AD, SG or CVD). The EU, India, Peru and the US initiated the most TP investigations during the sample period, with more than 500 affected 6-digit sectors each.[16] Argentina follows closely in terms of frequency.

[15] Note that sectoral tariff overhangs do not necessarily have to be positive. Tariff overhangs at the 6-digit HS level can be negative for at least three reasons: 1. No bindings are set for certain sub-sectors (which can bias the 6-digit average bound rate), 2. after negotiating new bound rates, WTO members are usually granted phase-in periods during which applied tariffs can exceed the new tariff bindings, and 3. the presence of non-tariff barriers might bias the calculation of tariff overhangs due to the necessary conversion into ad valorem equivalents. To avoid the last issue, I do not consider non-tariff measures in the tariff overhang calculations. However, the estimates are not qualitatively affected by this choice. Results which include non-tariff measure equivalents are available on request.

[16] In contrast to the other countries, a large share of Peru's TP investigations is concentrated in relatively few industries

Jamaica, Japan, Paraguay and Trinidad and Tobago, on the other hand, are the least active countries in the sample in terms of TP frequency with fewer than 10 investigations each.[17] Overall, AD investigations are the most popular tool to implement TP measures with Chile, Ecuador, the Philippines and Venezuela being notable exceptions. In these countries, 6-digit sectors with SG investigations outweigh the number of AD probes.[18]

The right panel of Table 1 reports the tariff overhang distribution for each country using the same categories as in Figure 1. The data shows that there is substantial variation in MFN tariff setting flexibility across the WTO members in the sample. Four countries (China, EU, Japan, US) feature very tight tariff overhangs across the board as they have set their applied MFN tariffs at the respective bound rate in over 90 percent of import sectors. On the other hand, four countries are barely restricted by their bound tariff commitments: Costa Rica, Jamaica, Pakistan, and Trinidad and Tobago have tariff overhangs of more than 40 percent for over half of all products. The remaining 22 countries in the sample fall between these two extremes. For the latter group (except Canada), the vast majority of import sectors features tariff overhangs between 0 and 40 percent. To ensure that the results below are not driven by specific country groups, the empirical analysis will examine various subsamples of the data.

In addition to the temporary protection and tariff data, we require information on sectoral trade volumes and preferential trading relationships. Trade data at the 6-digit HS level is obtained from Comtrade, while information on bilateral PTAs over time comes from de Sousa (2012). Table 2 provides summary statistics, definitions and data sources for all variables used in the analysis.

4 Baseline Results

This section presents the baseline results of the empirical model outlined in equation (1). I first obtain estimates using a logit framework, and subsequently consider a linear probability model to examine the robustness of the findings. Table 3 shows the average marginal effect estimates from logit regressions of the binary TP indicator on the tariff overhang measure and additional control variables. Standard errors (clustered at the country/2-digit HS level) are reported in parentheses.

Column (1) in Table 3 considers the most parsimonious specification, which only includes the

and years (apparel, HS chapters 61 and 62, in 2004 and 2012). The results below are robust to excluding these cases.

[17] The estimates below are virtually identical when excluding these countries from the analysis. Detailed results are available upon request.

[18] The literature has not explicitly explored why the composition of TP measures varies across countries. While certainly of interest, this question is beyond the scope of this paper.

tariff overhang variable in addition to the country-year and 2-digit HS industry fixed effects. The tariff overhang coefficient is negative and statistically significant at the one percent level, indicating that a greater tariff overhang in a given sector is associated with a lower probability of initiating a future TP investigation. Based on this result, tariff overhangs and TP measures appear to be substitutes. The coefficient of -0.0134 implies that, on average, a decrease in the sectoral tariff overhang from 22 to 0 percentage points, which corresponds to a move from the 75th to the 25th percentile in the data, is associated with an increase in the probability for the initiation of TP proceedings of .29 percentage points ($= -.22 \times (-.0134) \times 100$). As the unconditional probability for a TP investigation in a given sector and year is .42 percent in the sample, the magnitude of the estimate implies a substantial economic impact of tariff overhangs on the number of newly implemented TP measures.

Column (2) introduces the three additional TP and tariff overhang determinants that were discussed in section 3: log(Imports), PTAImportShare and log(WorldImportShare). The tariff overhang estimate remains stable and highly statistically significant after including these variables. Two of the newly introduced control variables also show significant effects. First, the volume of sectoral imports, log(Imports), has a significant positive impact on the probability that a TP investigation is initiated. This result indicates that TP measures are more likely to benefit domestic producers in sectors with greater import competition. Second, we detect a significant effect of the share in sectoral world imports, log(WorldImportShare), which captures a country's market power to influence world prices with its trade policy actions. As is well known, the sectoral world import share is inversely related to the foreign export supply elasticity that a country faces (see, e.g., Beshkar et al. 2015). TP proceedings should be more appealing when countries have more market power to influence the terms of trade in their favor. However, the estimate in column (2) suggests that a greater world import share actually reduces the likelihood of TP measures. The reason for this surprising result lies in the fact that part of the market power effect is already captured by the import volumes term. When omitting the log(Imports) term in specification (3), the log(WorldImportShare) coefficient indeed turns positive and is also significant at the one percent level. Thus, greater sectoral market power indeed makes TP investigations more probable. Below I also consider sectoral import growth as well as the import demand and export supply elasticities as additional TP determinants to fully account for terms-of-trade motives. The estimated tariff overhang effects are not affected by the omission of these variables.

The sectoral import share from PTA partners in specifications (2) and (3) has no statistically significant impact on the likelihood of TP measures. Column (4) further investigates the relationship between import shares from PTA partners, tariff overhangs and TP activity. In particular, I introduce an interaction between the Overhang and the PTAImportShare terms to examine whether the tariff overhang channel is less pronounced for sectors in which countries import a greater share from PTA partners who are supposedly not subject to MFN tariffs. While the positive coefficient of the interaction points in that direction, the effect is not statistically significant. Note that column (4) reports the composite effects for both the Overhang and PTAImportShare variables, which take into account the interaction between both terms.[19] The tariff overhang coefficient in specification (4) is only slightly more negative than in column (2) and the composite PTAImportShare effect is nearly unchanged as well.[20] I also examined whether the tariff overhang coefficient is affected by the share of sectoral imports entering under unilateral GSP provisions. When including a GSP import share measure and its interaction with the tariff overhang variable, the estimate is nearly identical to column (4) – detailed results are available upon request. Thus, the empirical evidence indicates that the tariff overhang channel operates independently of preferential trading relationships. More generally, preferential trade deals also seem not to lower the frequency of TP investigations.[21]

Specifications (5) to (7) in Table 3 examine whether tariff overhang pressures have a differential impact on AD versus CVD and SG investigations. This question is of particular interest as most of the literature focuses squarely on the determinants of AD proceedings while neglecting other unfair trade protection measures. Column (5) considers on the left hand side an indicator variable that takes the value one if a country launches one or more antidumping investigations ($\text{AD}_{ict} = 1$) in a given sector and year, and zero otherwise ($\text{AD}_{ict} = 0$). In contrast, columns (6) and (7) replace the TP indicator with binary variables that take the value one if at least one CVD or SG investigation is initiated, respectively, and zero otherwise. Note that the sample size shrinks in all cases compared to specifications (1) to (4) as the logit regressions drop all observations which are perfectly predicted by the included fixed effects. That is, observations at the country-year and 2-digit sectoral level are omitted if they show no variation in the dependent variable, i.e., never initiated or always initiated TP investigations. More observations are dropped in columns (6) and (7) due to the fact that CVD

[19] In the logit model, the marginal composite Overhang effect that takes into account the interaction with PTAImportShare is given by $\partial Pr(TP_{ict} = 1|/\partial Overhang_{ic,t-1}) = \Lambda(\beta X)(1 - \Lambda(\beta X))(\beta_1 + \beta_2 PTAImportShare_{ic,t-1})$ where $\beta X = \beta_1 Overhang_{ic,t-1} + \beta_2 Overhang_{ic,t-1} \times PTAImportShare_{ic,t-1} + \gamma Z_{ic,t-1} + \eta_s + \omega_{ct}$. A similar expression applies to the marginal composite PTAImportShare effect.

[20] The tariff overhang coefficient also remains stable when excluding all TP investigations that target PTA partners and their respective trade volumes. Detailed results are available upon request.

[21] In recent work, Tabakis and Zanardi (2017b) find that the negotiation and implementation of PTAs lead to fewer AD measures against non-member countries, indicating a building block effect of preferential trade agreements.

and SG investigations are in general rarer than their AD counterparts (see Table 1 and Table 2).

Two interesting results emerge in columns (5) through (7). First, the tariff overhang coefficients are negative and significant at the one percent level in all cases, mirroring the baseline TP specification in column (2). Thus, even when differentiating between AD and other TP measures that have received less attention in the literature, the estimates reveal the same inverse relation with tariff overhangs. Less available flexibility in the setting of MFN tariffs is associated with the adoption of WTO-sanctioned TP measures as suitable policy substitutes. Second, in the case of safeguard investigations, the estimated average marginal effect of tariff overhangs is substantially larger than for antidumping and countervailing duties. One possible explanation for the latter result is that safeguards and MFN tariffs are the closest potential substitutes among the three types of TP measures. In general, safeguards are supposed to target much broader groups of exporters than AD or CVD investigations. However, it should be noted that it is also a common practice to exempt many countries from safeguard duties, making them less substitutable for MFN tariffs than one would suspect. These exemptions can be either due to WTO rules, such as the de minimis import volume exemption for developing economies, or based on other country-specific considerations.[22] In any case, the results show that greater tariff overhangs are associated with significantly easing the pressure on initiating any kind of TP measure.

Finally, specifications (8) and (9) in Table 3 consider the relationship between tariff overhangs and TP investigations at more aggregate levels. Instead of conducting the estimation at the 6-digit HS level, column (8) matches average tariff overhangs and binary TP indicators by 2-digit codes. The 2-digit level aggregates the 6-digit information from around 5,000 sectors to 97 industries.[23] Column (9) repeats a less stringent aggregation exercise to the 4-digit HS level, which conforms to around 1,200 sectors. In both the 2-digit and 4-digit level specifications, the tariff overhang coefficient is again negative and statistically significant at the ten and one percent level, respectively. Hence, even at more aggregate levels we observe that lower sectoral tariff overhangs are linked to more TP investigations. However, there are also two differences that emerge compared to the baseline results in column (2). First, in the 2-digit model in column (8), the signs for both log(Imports) and log(WorldImportShare) are reversed, indicating that with aggregate data the world import share variable is more successful in capturing both a country's market power and the level of benefits

[22] For instance, the US in its 2001 steel safeguard investigation exempted 102 countries and territories from the eventual safeguard duties, including all of its PTA partners at that time: Canada, Mexico, Israel and Jordan.

[23] The exact number of 6-digit HS sectors depends on the HS nomenclature in use which is frequently updated over the years.

accruing to domestic producers from TP measures. Second, the magnitude of the tariff overhang coefficient increases with the level of aggregation, which is line with expectations as the sectoral prevalence of TP investigations rises when conducting the analysis at the 2- and 4-digit levels.[24]

To further examine the robustness of the logit estimates, Table 4 presents results using instead a fixed effects linear probability model. Columns (10) to (18) in Table 4 replicate the earlier specifications from Table 3. The tariff overhang coefficients from the linear model closely match the signs and significance levels of the earlier results in Table 3. While the magnitude of the marginal effects is slightly lower than in the logit specifications, the linear probability model results confirm the earlier findings: Sectoral tariff overhangs and TP measures function as substitutes. With regard to the remaining control variables, a similar overlap in results emerges between Table 3 and Table 4. Sectoral imports, log(Imports), are still estimated to have a significant positive effect on the initiation of TP proceedings while a significant negative link is detected for the world import share, log(WorldImportShare). As in the logit case, the 2-digit HS estimates in column (17) are again an exception to this trend. In line with the previous results, the PTAImportShare coefficient is not statistically significant in most of the specifications, indicating again no systematic relationship between preferential trading concessions and the use of TP measures.[25]

Note that for ease of comparison, specifications (10) to (18) consider the exact same sample composition as in the logit setup in Table 3. However, as previously mentioned, the logit estimations drop all observations which lack sufficient variation in the dependent variable as these realizations are perfectly explained by the included fixed effects. To make sure that the tariff overhang estimate is not driven by sample selection issues, specification (19) in Table 4 reports results that also include all observations that were dropped by the logit model. The expanded sample exceeds the baseline specification in column (11) by 701,295 observations. The pattern of the coefficient estimates in the larger sample matches the earlier results. While the coefficient magnitude decreases, the tariff

[24] Table A1 in Appendix A illustrates that the significant effects in Table 3 are mostly driven by sectors with a relatively tight tariff overhang (less than 20 percent). Table A1 uses in place of the continuous tariff overhang measure two dummy variables: 'Overhang: <20%' takes the value one if the tariff overhang in a given sector is less than 20 percent while 'Overhang: 20%to40%' captures overhang observations between 20 and 40 percent.

[25] Table A2 in Appendix A re-estimates the linear baseline specification in column (11) with alternative fixed effects and clustering choices. The magnitude and statistical significance of the tariff overhang effect is remarkably stable when controlling for 4-digit or 6-digit HS fixed effects in columns (A10) and (A11). The same is true when interacting the country-year fixed effects with their 2-digit and 4-digit HS counterparts in specifications (A12) and (A13). Columns (A14) to (A17) use instead a more restrictive set of clustering choices compared to the country/2-digit HS level in the baseline: country/2-digit HS/year, country/4-digit HS/year, country/4-digit HS, and country/6-digit HS. In all cases, the tariff overhang coefficient remains significant at the one percent level. In fact, the standard error for the tariff overhang coefficient is larger in specification (11) in Table 4 compared to all alternatives in Table A2, indicating that the baseline represents the most conservative clustering choice.

overhang variable retains a highly significant negative link with the initiation of TP proceedings. Thus, specification (19) confirms that the earlier results are not driven by the sample selection of the fixed effects logit model.

The results in Table 3 and Table 4 indicate that tariff overhangs offer countries policy flexibility to address domestic protectionist demands if needed. However, the same level of tariff overhang can be associated with different applied tariff levels, e.g., an applied tariff of 5 percent or an applied tariff of 35 percent. One could argue that in the latter case a country is, in relative terms, using more of its policy space to respond to protectionists pressures than in the former example. Hence, applied and bound tariff levels might contain additional useful information beyond tariff overhangs to explain a country's decision to initiate a TP investigation in a given sector.

Table 5 therefore introduces the bound tariff rate as an additional determinant to account for this possibility. Specification (20) adds a country's 6-digit HS bound tariff rate to the baseline model in column (2) of Table 3. The bound tariff rate has a positive and significant (at the five percent level) effect on the probability to initiate TP proceedings. That is, countries with a higher bound tariff rate for a given product are indeed more inclined to seek additional protection, reflecting potentially greater domestic trade policy pressures. At the same time, the tariff overhang coefficient remains negative and significant at the one percent level. To test more directly whether the same level of tariff overhang implies a varying degree of policy space depending on the bound tariff level, column (21) also introduces the interaction of both variables. While the bound tariff on its own becomes statistically insignificant, the interaction with the tariff overhang measure is positive and significant at the one percent level. Hence, at any given tariff overhang, a country is more likely to initiate TP proceedings for a given product when it features a higher bound tariff. The results from the corresponding linear probability models in columns (22) and (23) are similar to the logit specifications, except that the bound tariff coefficient never shows a statistically significant impact on its own. Finally it should be noted that accounting for the bound tariff in Table 5 even increases the magnitude of the tariff overhang link with the initiation of TP proceedings compared to the baseline specifications (2) in Table 3 and (11) in Table 4.

5 Extensions

Having offered strong support for the hypothesis that MFN tariff overhangs and TP measures function as substitutes and not complements, this section implements five extensions of the baseline model. In particular, the analysis below (i) considers the robustness of the results when excluding potentially crucial subsamples, (ii) controls for additional determinants of TP activity suggested in the literature, (iii) examines the relationship of tariff overhangs and the incidence of actually implemented TP tariffs, (iv) exploits the information on the actual number of sectoral and country-specific TP investigations via count data models, and (v) dissects the tariff overhang impact by industries.

5.1 Subsample Results

Table 1 shows that the number of initiated TP proceedings varies substantially between countries. The frequency of TP investigations in the sample ranges from two affected 6-digit HS sectors for Paraguay to 858 for Peru. To ensure that the tariff overhang effects identified above are not driven by specific country groups, I exclude different subsamples from the empirical analysis in Table 6.

Let us first consider the possibility that the previous results could be affected by countries which initiate relatively few TP proceedings and thus pose an increased risk of introducing outliers into the analysis. Using the baseline logit model from column (2) in Table 3, specifications (24) to (26) in Table 6 report results when I successively remove countries that feature the lowest count of TP investigations (see Table 1). Column (24) discards all countries from the sample with 25 or fewer initiated TP proceedings. Columns (25) and (26) further restrict the sample by eliminating countries with fewer than 75 and 150 6-digit sectors that have been subject to new TP measures, respectively. Three results emerge from specifications (24) to (26). First, tariff overhangs remain a highly significant negative determinant of TP investigations even after excluding countries with a relatively low incidence of cases. Second, the average marginal effect of tariff overhangs rises with the successive exclusion of countries that feature a low count of sectors with TP proceedings, which we should expect as the share of sectors with TP measures in the sample increases. Third, the conclusions with regard to all other control variables remain unchanged. Columns (28) to (30) in Table 6 report the corresponding results when I employ instead a linear probability model framework. The magnitude and significance pattern for all estimates is again very similar to the logit results. Hence, independent of the estimation approach, tariff overhangs remain a highly significant negative predictor of TP proceedings even after excluding potential outliers in countries that are less inclined to use such measures.

It is, of course, an equally valid concern that the substitution effect between tariff overhangs and TP activity is driven by heavy users of such measures. In the baseline sample, four countries feature more than 500 TP investigations each: India, Peru, the European Union, and the United States.[26] At the same time, it is well-documented that both the US and the EU have, on average, low sectoral tariff overhangs while a robust inverse relationship between tariff cuts and TP usage has been reported for India.[27] Hence, to rule out that the above results are driven by very active TP users, column (27) in Table 6 provides logit estimates of the baseline specification when these four countries are excluded from the sample. While slightly decreasing in magnitude, the tariff overhang coefficient remains negative and significant at the one percent level. The inverse relationship between tariff overhangs and TP investigations is not driven by the heavy users of these measures.[28] This conclusion is also confirmed by the linear probability model estimates in column (31). As the linear probability model results show consistently the same pattern, the remainder of the paper only reports average marginal effects using the logit specifications. The results for the corresponding linear models are throughout qualitatively similar and available upon request.

5.2 Accounting for Additional TP Determinants

As discussed in Section 2, the theoretical and empirical literature suggests a number of alternative drivers of TP measures and in particular AD investigations. In this part, I focus on four major channels that are frequently considered in previous studies: (i) import surges and terms-of-trade motives, (ii) tariff rate changes, (iii) retaliation concerns, and (iv) sectoral political economy concerns.[29] The results below show that sectoral tariff overhangs retain their significant link with TP proceedings even after controlling for these factors.

Beginning with Bagwell and Staiger (1990), a 'managed trade' literature has emerged that links periods with unexpected import surges to additional protectionist demands during such times. To examine whether the tariff overhang estimates are sensitive to this channel, column (32) in Table 7 adds the 3-year change in log sectoral imports (at the 6-digit HS level) to the baseline logit specification, which captures both short- and medium-term trends in sectoral imports. The results

[26] Documentation on the frequent use of TP measures in these countries is also provided by, amongst others, Knetter and Prusa (2003), Feinberg and Reynolds (2007), Moore and Zanardi (2011), and Blonigen and Prusa (2016).

[27] See Beshkar et al. (2015), Kuenzel (2017) as well as Table 1 for the prevalence of low tariff overhangs in the US and the EU. Bown and Tovar (2011) link tariff reductions in India to subsequent surges in TP activity.

[28] The results are nearly identical when only the EU and the US are excluded. Tariff overhangs also retain their significant negative impact on the incidence of TP investigations when one distinguishes between advanced and developing economies. Detailed estimates are available upon request.

[29] Note that the presence of country-year and industry fixed effects prevents the separate inclusion of a number of potential macroeconomic and industry-specific determinants suggested in the literature, such as unemployment, the business cycle, or exchange rates. See Bown and Crowley (2013b) for a discussion.

are qualitatively similar with one-year changes (available on request). When accounting for sectoral import growth, the tariff overhang coefficient remains negative and significant at the one percent level. In fact, the magnitude of the estimated average marginal effect on TP investigations even increases. At the same time, import growth itself has no significant impact on the likelihood of TP proceedings. More generally, the estimates from specification (32) provide evidence that after controlling for sectoral import levels in the form of log(Imports) and log(WorldImportShare), there is little room for import growth as a separate determinant of TP proceedings. This result is in line with Prusa and Skeath (2005) who find that while big exporters are more likely to be subject to AD actions, import surges are not associated with more AD filings. One potential explanation for this finding is that import surges can be driven by both foreign supply or domestic demand shocks which renders an ambiguous effect on domestic protectionist demands. Most importantly, however, the substitution effect between tariff overhangs and TP measures is once more confirmed.

Bown and Crowley (2013a) emphasize that terms-of-trade gains after implementing temporary trade barriers are greater in sectors with lower import demand and export supply elasticities. Column (33) therefore introduces as additional TP determinant the sectoral inverse of the sum of the import demand and export supply elasticities, 1/[IM + EX Elasticities]. Country-specific import demand and export supply elasticities at the 6-digit HS level are obtained from Nicita et al. (2018) and augmented with 4-digit elasticities from the same source if the former is not available. In addition, as the import growth and elasticity effects should reinforce each other, I follow Bown and Crowley (2013a) and include in specification (33) the interaction of $\Delta log(Imports)$ and 1/[IM + EX Elasticities]. Note that Table 7 does not report a separate marginal effect for this interaction but includes instead the eventual composite effects for both the import growth and elasticity terms which take into account the interaction.[30] The introduction of the elasticity measure in column (33) does not affect the inverse relationship between tariff overhangs and TP investigations. At the same time, the inverse sum of the import demand and export supply elasticities has no significant impact on TP activity. Thus, even after controlling for terms-of-trade motives and import growth, tariff overhangs and temporary protection measures remain substitutes.

As previously discussed, several papers in the literature have considered the question whether

[30] Similar to the earlier discussion in footnote 19, the marginal composite effect for log(Imports) that takes into account the interaction with the elasticity term is given by $\partial Pr(TP_{ict} = 1|/\partial \Delta log(Imports)_{ic,t-1}) = \Lambda(\beta X)(1 - \Lambda(\beta X))(\beta_2 + \beta_4 \times 1/[IM + EXElasticities]_{ic})$ where $\beta X = \beta_1 Overhang_{ic,t-1} + \beta_2 \Delta log(Imports)_{ic,t-1} + \beta_3 \times 1/[IM + EXElasticities]_{ic} + \beta_4 \Delta log(Imports)_{ic,t-1} \times 1/[IM + EXElasticities]_{ic} + \gamma Z_{ic,t-1} + \eta_s + \omega_{ct}$. A similar expression applies to the marginal composite effect of 1/[IM + EX Elasticities].

WTO members are more likely to implement non-tariff barriers and/or TP measures after larger tariff reductions (e.g., Feinberg and Reynolds, 2007, Moore and Zanardi, 2011, and Ketterer, 2016). The logit specification in column (34) of Table 7 therefore introduces as an additional control variable the 3-year change in the 6-digit HS sector's applied tariff rate, which again captures both short- and medium-term effects of tariff changes. The results with one-year tariff changes are similar (and available on request). Column (34) shows that tariff adjustments have, on average, no significant effect on the probability of subsequent TP proceedings. Although the sample size drops due to the inclusion of the change in the applied tariff rate, the estimated average marginal effects for the remaining variables, including the tariff overhang channel, are comparable to the baseline logit specification in column (2) of Table 3. Even after accounting for changes in sectoral tariff rates, tariff overhangs retain their highly significant negative link with TP investigations.[31]

Another channel that the literature has suggested to explain the observed pattern of TP investigations is retaliatory motives (e.g., Prusa and Skeath 2002, Feinberg and Reynolds 2006, and Bao and Qiu 2011). To further examine the robustness of the earlier results, columns (35) to (37) in Table 7 consider a number of different proxies for potential retaliatory motives when initiating TP measures. The literature defines a TP investigation as potentially retaliatory if a trade partner recently initiated similar proceedings targeting the same or a similar product. Column (35) defines retaliatory motives in a relatively broad fashion. The binary variable 'TP Retaliation, 2-digit' takes the value one if at least one exporting country initiated an investigation against the importer at hand in the same 2-digit sector in the previous year, and zero otherwise. Using the 2-digit definition, the estimation results indicate that retaliation concerns at a relatively broad level play no significant role for the initiation of TP proceedings. The estimates for the tariff overhang variable and the remaining regressors resemble almost one-to-one the results of the baseline specification in column (2) of Table 3.

However, the 2-digit measure might be too crude to identify retaliatory motives as countries specify targeted sectors most of the time at least at the 6-digit level. Column (36) therefore replaces the broad 2-digit with a more targeted 6-digit retaliation measure. Specifically, the 'TP Retaliation, 6-digit' dummy takes the value one if at least one exporting country initiated a TP investigation against the importer in the same 6-digit sector in the previous year, and zero otherwise. When using

[31] The same conclusion holds when considering changes in bound instead of applied tariff rates. The tariff overhang estimates remain also stable when excluding bound tariff transition periods after the Uruguay Round or subsequent to new member accessions. These results are available upon request.

this much more detailed measure, the retaliation coefficient increases substantially in magnitude and now exerts a significant effect (at the one percent level). Thus, consistent with the findings in the earlier literature, countries are more like to invoke TP measures in sectors in which domestic exporters have recently faced sanctions abroad. To further investigate this channel, column (37) distinguishes between retaliatory 6-digit level AD, CVD and SG investigations abroad. The results indicate that the significant retaliation effect in specification (36) is driven by AD and SG sanctions which domestic exporters face in other countries. Foreign CVD investigations invoke no significant response, although the estimate is still positive.

Focusing mostly on the US context, a number of studies examine industry-specific characteristics and their impact on the initiation of TP proceedings. Industries with better political connections and worse performance are thought to be more likely to seek temporary protection. As no consistent industry-specific information on output and political leverage is available for the sample of countries at hand, I rely on the incidence of past TP investigations as the next best proxy of an industry's sway on policy makers. Specifically, column (38) introduces the dummy 'Past TP, 3 years', which takes the value one if a TP investigation was initiated by the importer in the previous three years in the same 6-digit sector. Two results emerge. First, the initiation of TP proceedings in the recent past is indeed a significant positive predictor of TP investigations in the present. Second, while the magnitude of the coefficient slightly decreases, the tariff overhang variable retains its significant negative association with future TP procedures. Thus, even after controlling for past sectoral protectionist demands, which can proxy for political clout and performance issues, tariff overhangs and temporary protection measures remain substitutes.

Finally, to examine the robustness of the tariff overhang results, specification (39) includes all additional TP determinants simultaneously: import growth, the inverse of the sum of the import demand and export supply elasticities (plus its interaction with import growth), tariff adjustments, aggregate 6-digit retaliation concerns, and recent TP procedures. The results show that the negative and significant link of tariff overhangs with the probability of TP investigations is preserved. The magnitude of the average marginal effect is even slightly greater than in the baseline specification in column (2) of Table 3. Moreover, the estimates for all other variables are similar to the previous results in Table 7. Hence, the empirical evidence from the logit regressions in Table 7, which include a host of additional TP determinants, confirms the earlier findings. Tariff overhangs function as a substitute for TP measures. Of the additional control variables, retaliatory motives, past TP initiation patterns, the level of imports and the share in world imports also turn out to be consistent significant predictors of TP proceedings.

5.3 Temporary Protection Tariffs

The analysis so far considered as dependent variable the initiation of temporary protection investigations by importing countries. This measure is an appropriate indicator for sectoral protectionist pressures as long as governments only take up investigations that have a reasonable chance to result in the application of additional tariffs. The data supports this point as 4,505 out of 6,131 investigations in the sample, or 73 percent, eventually result in a temporary protection tariff. It could be argued, however, that the sectoral incidence of actually implemented TP tariffs is a more appropriate measure of protectionist tradeoffs that governments face. To examine this possibility, Table 8 employs as dependent variable a binary measure which takes the value one if country c initiates the application of a temporary protection tariff in sector i in year t (see Appendix B for details). Table 8 follows the same format as Table 7. Columns (40) to (46) separately consider the previously specified additional TP determinants, while specification (47) accounts for all variables simultaneously. One difference to Table 7 is that the past TP investigations dummy ('Past TP, 3 years') is now replaced with a binary variable ('Past TP Tariff, 3 years') that takes the value one if the country imposed a new TP tariff in the same sector in the previous three years, and zero otherwise.

Three interesting results emerge from the logit average marginal effect estimates in Table 8. First, as in Table 7, there is a highly significant negative association of tariff overhangs with the application of sectoral TP tariffs throughout, independent of the included controls. Second, both retaliatory motives and past sectoral TP activities retain their positive and significant effects on the incidence of temporary protection tariffs. The former result is again driven by AD and SG investigations abroad (see column (45)). Third, compared to Table 7, three additional variables are significant drivers of TP tariffs: 3-year import growth, the inverse of the sum of the import demand and export supply elasticities, and the 3-year change in the applied tariff rate. In particular, specifications (40), (41) and (47) show that import growth is negatively associated with the incidence of a TP tariff. This result might seem surprising as the 'managed trade' literature links import surges to temporary protection. However, as previously discussed, an increase in imports could also be induced by a positive domestic demand shock. In that case, a rise in imports decreases the likelihood of additional protectionist demands by domestic actors. The signs of the elasticity terms in columns (41) and (47) run counter to the results found by Bown and Crowley (2013a) for the US.

However, this outcome could be due to the fact that many smaller countries in the sample have only limited market power in most import sectors, implying that terms-of-trade motives might only play a secondary role in explaining the incidence of TP tariffs across countries and sectors.

At the same time, specifications (42) and (47) indicate that sectors which face protectionist pressure by domestic constituents, as reflected by recent applied MFN tariff increases, are more likely to eventually also feature a TP tariff. As applied tariffs can only be raised up to the bound rate, continuing demands for protection eventually result in a TP tariff in the presence of a small overhang. This result is further evidence for a substitution effect between tariff overhangs and TP measures, independent of the fact whether one focuses on the initiation of investigations or the application of actual additional tariffs as dependent variable.

5.4 Count Data Models

Focusing on a binary dependent variable when examining the determinants of TP proceedings could discard useful variation in the data. That is, if multiple TP investigations take place within a given 6-digit HS sector, a binary coding for the dependent variable might understate the true degree of protectionism. This part therefore employs count data models to examine whether the above results are sensitive to this choice. In particular, I will use a negative binomial regression framework, which is particularly attractive in the present context as it can account for the potential overdispersion in the number of TP actions in specific sectors. Note that Appendix B provides a detailed discussion, including definitions and examples, of the different count variables introduced in this part.

In a first step, specifications (48) and (49) in Table 9 differentiate between the number of distinct TP measures that are simultaneously applied in a given sector. Specifically, the dependent variable, 'TP Type Count', now ranges from zero to three, where the numerical value reflects how many different types of TP investigations are simultaneously initiated in a sector. A zero indicates no initiated TP action for a given 6-digit HS product while counts of one, two and three reflect how many distinct types of investigations have been triggered out of the three possible options: AD, CVD, SG. Column (48) presents average marginal effect estimates for the baseline specification which includes the tariff overhang measure, the log of sectoral imports, the PTA import share, and the world import share (in logs). As before, all specifications in Table 9 also account for country-year and 2-digit sector fixed effects. When applying the negative binomial model, the association between tariff overhangs and the likelihood of TP investigations is again negative and statistically significant at the one percent level. Moreover, the magnitude of the tariff overhang coefficient is comparable to the baseline logit specification in column (2) of Table 3. The results for the remaining control variables also closely resemble the prior findings. Column (49) introduces again all additional TP determinants from the previous section. As in Table 7, only the measures that account for retaliation concerns and past TP investigations have a persistent positive effect. More importantly, we can conclude that tariff overhangs are inversely linked to the number of distinct TP types that are invoked in a given 6-digit sector, even after controlling for a host of other factors.

However, many TP measures are applied below the 6-digit HS level and thus the count variable used above might still mask some of the existing heterogeneity across sectors. As previously discussed, the TTBD database frequently lists products under investigation at the 8- or even 10-digit HS level. Specifications (50) and (51) in Table 9 therefore disaggregate the number of initiated TP proceedings even further. The dependent variable now consists of the count of actual products within a given 6-digit HS sector that are subject to a newly initiated investigation ('TP Product Count'), counting all AD, CVD and SG measures below the 6-digit level. Three results emerge when considering the baseline negative binomial regression in column (50). First, the tariff overhang estimate remains negative and significant at the one percent level. Second, the positive impact of log(Imports) and the negative effect of log(WorldImportShare) mirror the earlier findings. Both estimates are significant at the one percent level. Interestingly, with the more detailed count measure, we now also detect a negative and significant effect (at the one percent level) for the PTAImportShare variable. That is, a greater share of imports that is accounted for by PTA partners lowers the number of initiated TP investigations at the 8- and 10-digit HS levels. Third, compared to the previous specifications, the magnitude of the average marginal effects increases for all variables, including tariff overhangs. This result is most likely due to the increase in the mean and range of the dependent variable, raising in turn the coefficient estimates compared to the specifications that considered the more conservative count measure in columns (48) and (49) or the binary indicator in the logit/LPM regressions. Introducing the previously suggested determinants of TP investigations in specification (51) does not change these conclusions. Both retaliatory motives and past TP investigations exert again positive and significant effects on the count of TP products under investigation. As in some of the previous specifications, the composite average marginal effect of the inverse elasticity term is negative and significant (at the five percent level). We also observe, for the first time, a negative and significant effect for the change in the applied tariff rate, indicating that past reductions in the applied MFN tariff increase the count of products targeted with a TP measure.

Another source of heterogeneity in the temporary protection context is the count of countries that are actually affected by a TP measure. This distinction is potentially important as, for instance, an antidumping investigation might target only one exporter while safeguard protections usually apply much more broadly. To distinguish between these cases, specifications (52) and (53) in Table 9 use as dependent variable the count of countries that is affected by a TP investigation in a given 6-digit HS sector. The negative significant estimates in both columns indicate that lower tariff overhangs result in TP measures that affect more exporters. That is, temporary protection is applied broadly in terms of country coverage if MFN tariff flexibility is more limited. With regard to the other TP determinants, the results in column (53) are qualitatively similar to the specification in (51). Only import growth shows no significant effect.

Overall, the estimates from the count data models in Table 9 show that tariff overhangs are not only associated with a lower probability of a future TP investigation. Higher sectoral tariff overhangs also decrease the range of distinct types of TP measures that importers apply, lower the count of affected products and limit the number of exporters that are targeted. Moreover, the consistency of the estimates across three empirical frameworks —logit, linear probability and count data models— offers strong support for the hypothesis that sectoral tariff overhangs and TP measures function as substitutes for WTO member countries.

5.5 Tariff Overhang Effects by Industry

The analysis so far has been silent on the potential heterogeneity of the tariff overhang channel across different industries. For instance, is the observed substitution effect driven by sectors that have witnessed substantial TP activity in the recent past, such as metal products and clothing? To address this question, I divide the import sectors in the sample into six broad industry categories (2-digit HS definition in parentheses): 1. agriculture (HS 1-24) , 2. chemicals (HS 26-40), 3. clothing (HS 41-43, 50-67), 4. manufactures (HS 84-97), 5. materials (HS 25-27, 44-49, 68-71), and 6. metals (HS 72-83). Out of the total number of 6,131 TP investigations in the sample, metals and clothing together account for nearly 60 percent, 1,897 and 1,723 cases, respectively. Chemicals are responsible for around 17 percent of TP measures (1,019 cases) while much lower numbers are observed for materials (609 cases), manufactures (586 cases) and agriculture (297 cases). To extract the industry-specific tariff overhang effects on TP measures, I modify the estimation equation in (1) by adding interactions of the Overhang variable with six industry dummies, D_k:

$$TP_{ict} = \sum_{k}^{K} \beta_k Overhang_{ic,t-1} \times D_k + \gamma Z_{ic,t-1} + \eta_s + \omega_{ct} + \epsilon_{ict} \quad (3)$$

where β_k captures the effect of tariff overhangs on TP activity in industry k out of the set K of industries specified above.

Table 10 reports the industry-specific average marginal effects of tariff overhangs from a logit regression of equation (3). As before, the specification also includes controls for log(Imports), PTAImportShare, and log(WorldImportShare) as well as country-year and 2-digit HS fixed effects. Two results emerge from the table. First, except for the clothing category, we observe a highly significant inverse relationship between tariff overhangs and TP measures in all industries. One potential reason for the absence of a substitution effect between tariff overhangs and TP activity in the clothing sector is the presence of substantial non-tariff barriers in the form of the Multifibre Arrangement for part of the sample period. Even in the presence of low tariff overhangs, additional protection could be achieved by WTO members through the application of quotas on clothing and textile imports from developing economies without having to resort to TP measures.

Second, the magnitude of the substitution effect between tariff overhangs and TP activity varies substantially across industries. While chemicals, manufactures and materials feature tariff overhang impacts of a similar magnitude compared to the whole sample (see column (2) in Table 3), the estimate for the metal sector is about twice as high. The latter result is in line with the argument that steel and related industries have repeatedly demanded additional protection beyond MFN tariff bindings due to worldwide over-capacities. The Bush steel safeguards in the early 2000s and the steel and aluminum tariffs imposed by the Trump administration in 2018 are cases in point. At the same time, although highly significant, the tariff overhang effect on TP measures in agriculture is only about half the size of the full sample estimate. This result could be again explained by the fact that several non-tariff alternatives are available to WTO members to protect agricultural products, such as sanitary and phytosanitary measures or other technical barriers to trade.

6 Concluding Remarks

The use of temporary protection measures in the form of antidumping, safeguard and countervailing duties has surged substantially among GATT/WTO members over the last three decades. The increased prevalence of targeted import protection raises concerns as some of the hard-wrought reductions in MFN tariffs of the past are in danger of being reversed. This paper addresses the question whether the negotiated MFN tariff structure itself is one of the crucial drivers for the initiation of TP proceedings. The idea that demands for protection and in particular changes in tariff rates are determinants of TP proceedings is not new. Much of the theoretical literature supports the notion that tariffs and TP measures are substitutes, but existing empirical studies only provide mixed evidence on the link between tariff cuts and the incidence of AD, SG and CVD investigations.

Guided by the predictions of the cap-and-escape model in Beshkar and Bond (2017), I take a new approach in this paper and examine a key trade policy measure that was previously neglected in the literature on TP determinants: sectoral tariff overhangs, the difference between WTO bound and applied tariff rates. Countries should only be inclined to implement sectoral TP measures when they cannot adjust their MFN applied rate without legal repercussions, i.e., in the case of a low tariff overhang, independent of past tariff reductions. I test this hypothesis using detailed sectoral data for 30 WTO member countries over the period 1996-2014. The empirical analysis provides strong evidence that tariff overhangs and TP measures are substitutes, while changes in tariffs have little or no effect. This result is robust to various estimation methods, subsample selection, and the inclusion of other previously suggested determinants in addition to country-year and industry fixed effects. This paper therefore confirms what the theoretical literature has long suggested. The regulation of traditional tariff instruments leads to substitution effects toward TP measures (and potentially other non-tariff barriers). Moreover, the tariff overhang channel emerges as the key variable to capture this margin and allows us to determine which countries and sectors are more likely to become subject to TP investigations.

This finding has also important implications for other policy issues surrounding the WTO. Most importantly, the greater availability of tariff overhang space for poorer and smaller members is a contributing factor to their limited participation in WTO disputes. More unilateral trade policy flexibility limits the usage of TP measures, which are a frequent culprit for the emergence of trade quarrels. Designing a more accessible dispute settlement mechanism would then not only require technical and financial assistance to developing countries but also their willingness to limit their own tariff overhang space. Hence, developing countries face a tradeoff between their more active involvement in the key WTO institution of dispute settlement and giving up trade policy options.

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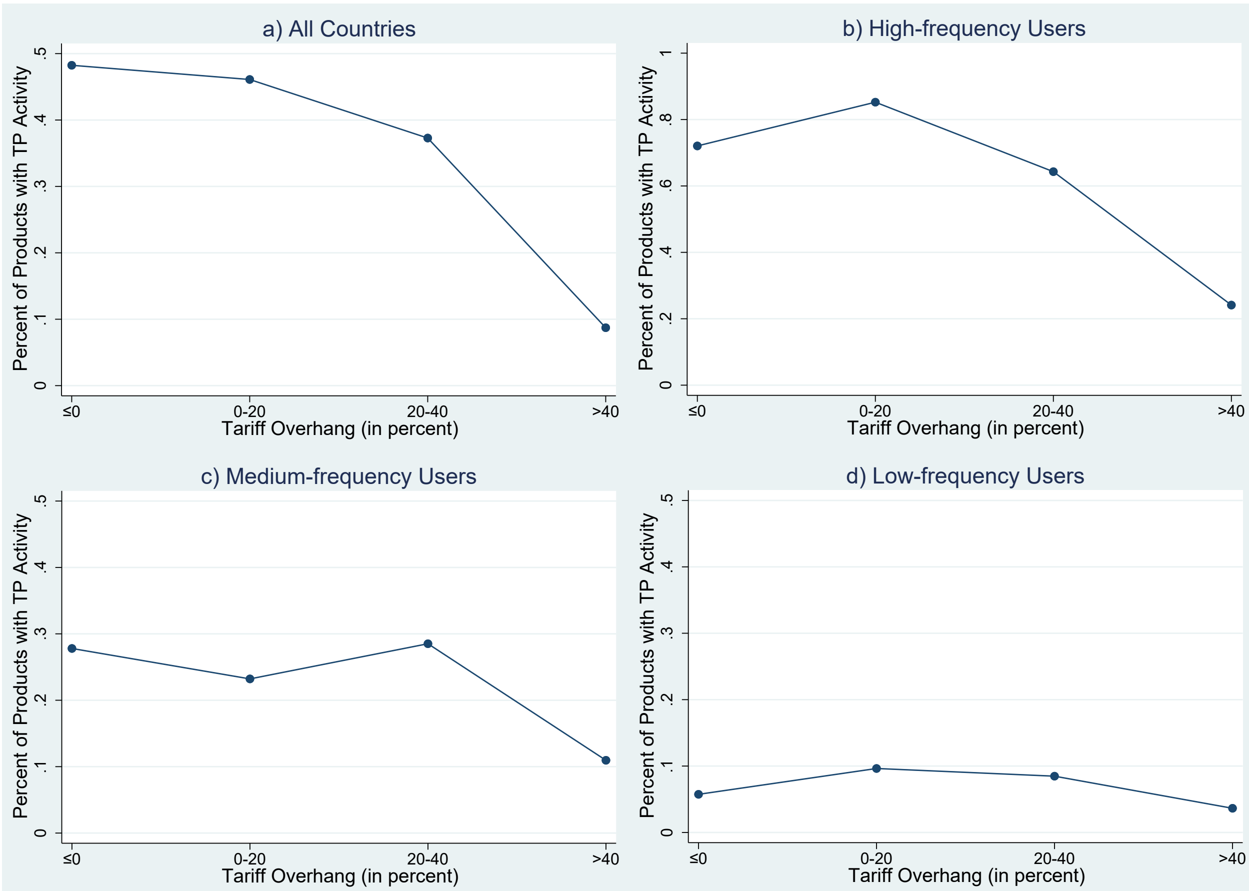
Figure 1: Share of 6-digit Sectors with TP Activity, by Tariff Overhang



Notes: Author's own calculations based on data for the baseline sample from the TTBD and TRAINS databases. Figure 1 shows the share (in percent) of 6-digit HS sectors that are subject to a new TP investigation in the subsequent year, sorted by tariff overhang categories. Panel a) reports results for the full sample, while panels b) through d) focus on high-frequency (total TP count: $\geq$200), medium-frequency (total TP count: >50 & $\leq$200) and low-frequency (total TP count: $\leq$50) user countries of TP measures, respectively. See Table 1 for TP counts by country.

Table 1: Temporary Protection Activity and Tariff Overhang Distribution by Country, 6-digit HS level, 1996–2014

Country	Observations	Total TP	AD	SG	CVD	Share of Sectors by Tariff Overhang			
						$\leq 0\%$	$0-20\%$	$20-40\%$	$> 40\%$
Argentina	80,437	432	374	55	3	0.027	0.568	0.404	0.000
Australia	77,289	190	179	9	36	0.251	0.691	0.051	0.006
Brazil	82,797	266	240	17	27	0.034	0.632	0.324	0.010
Canada	86,737	279	226	53	87	0.534	0.466	0.000	0.000
Chile	55,649	127	22	103	7	0.000	0.988	0.012	0.001
China	48,660	183	107	84	10	0.922	0.078	0.001	0.000
Colombia	70,947	222	114	108	0	0.019	0.159	0.739	0.082
Costa Rica	39,937	13	7	4	2	0.025	0.054	0.411	0.510
Ecuador	31,437	260	5	255	0	0.117	0.808	0.074	0.001
European Union	86,233	564	448	97	115	0.941	0.059	0.000	0.000
India	45,469	781	654	140	2	0.157	0.381	0.395	0.067
Indonesia	77,542	185	99	86	0	0.032	0.127	0.709	0.132
Israel	22,639	41	41	0	0	0.228	0.644	0.080	0.049
Jamaica	12,579	5	5	1	0	0.007	0.139	0.288	0.566
Japan	22,315	9	4	3	2	0.960	0.040	0.000	0.000
Malaysia	35,931	22	21	1	0	0.243	0.628	0.125	0.003
Mexico	85,630	169	156	10	5	0.051	0.279	0.661	0.009
New Zealand	50,150	41	41	0	0	0.403	0.524	0.073	0.000
Pakistan	35,524	65	63	2	8	0.115	0.051	0.060	0.774
Paraguay	6,752	2	2	0	0	0.021	0.450	0.528	0.000
Peru	65,428	858	437	411	11	0.018	0.597	0.383	0.003
Philippines	13,238	13	5	8	0	0.040	0.655	0.273	0.033
South Africa	64,833	86	83	3	9	0.228	0.646	0.098	0.027
South Korea	68,638	121	121	0	0	0.413	0.518	0.064	0.005
Thailand	22,121	67	58	9	0	0.259	0.348	0.389	0.004
Trinidad and Tobago	4,979	8	8	0	0	0.013	0.026	0.208	0.753
Turkey	35,318	133	89	44	1	0.145	0.611	0.209	0.035
USA	83,129	805	644	191	388	0.982	0.018	0.000	0.000
Uruguay	11,480	11	11	0	0	0.007	0.624	0.367	0.003
Venezuela	25,535	173	55	118	1	0.006	0.341	0.630	0.023

Notes: The sum of AD, SG and CVD does not equal the total TP measure count if different kinds of TP measures are simultaneously applied in the same 6-digit HS sector.

Table 2: Summary Statistics

Variable	Mean	Std. Dev.	Obs.	Definition	Source
AD	0.0032	0.0563	1,357,528	AD investigation (Yes: 1, No: 0)	TTBD database
AD Retaliation, 6-digit	0.0032	0.0562	1,449,353	Country under AD investigation in same 6-digit sector (Yes: 1, No: 0)	TTBD database
ΔAppliedTariff, 3 years	-0.0105	0.0419	1,066,620	3-year change in sectoral applied tariff (in ad valorem terms)	WITS database
BoundTariff	0.2432	0.1942	1,449,353	MFN bound tariff (in ad valorem terms)	WITS database
CVD	0.0022	0.0469	323,354	CVD investigation (Yes: 1, No: 0)	TTBD database
CVD Retaliation, 6-digit	0.0005	0.0224	1,449,353	Country under CVD investigation in same 6-digit sector (Yes: 1, No: 0)	TTBD database
1/[IM + EX Elasticities]	0.2214	0.3313	1,194,790	Sectoral inverse of sum of import demand and export supply elasticities	Nicita et al. (2018)
log(Imports)	7.3608	2.9875	1,449,353	log of sectoral imports (in $1,000s)	UN Comtrade
Δlog(Imports), 3 years	0.2140	1.2217	1,325,131	3-year change in log(Imports)	UN Comtrade
log(WorldImportShare)	-5.2491	2.4348	1,449,353	log of sectoral world import share	UN Comtrade
Overhang	0.1402	0.1500	1,449,353	MFN bound tariff – MFN applied tariff (in ad valorem terms)	WITS database
Past TP, 3 years	0.011	0.1042	1,449,353	TP investigation in same 6-digit sector in last 3 years (Yes: 1, No: 0)	TTBD database
PTAImportShare	0.3053	0.3603	1,449,353	Share of sectoral imports from PTA partners	UN Comtrade & de Sousa (2012)
SG	0.0056	0.0744	325,275	SG investigation (Yes: 1, No: 0)	TTBD database
SG Retaliation, 6-digit	0.0153	0.1226	1,449,353	Country under SG investigation in same 6-digit sector (Yes: 1, No: 0)	TTBD database
TP	0.0042	0.0649	1,449,353	TP investigation (Yes: 1, No: 0)	TTBD database
TP Affected Country Count	0.0133	0.2976	1,449,353	Number of countries under TP investigation in 6-digit sector	TTBD database
TP Product Count	0.0181	0.9856	1,449,353	Number of products under TP investigation in 6-digit sector	TTBD database
TP Retaliation, 2-digit	0.2627	0.4401	1,449,353	Country under TP investigation in same 2-digit sector (Yes: 1, No: 0)	TTBD database
TP Retaliation, 6-digit	0.0181	0.1333	1,449,353	Country under TP investigation in same 6-digit sector (Yes: 1, No: 0)	TTBD database
TP Type Count	0.0047	0.0757	1,449,353	TP investigation type count in 6-digit sector (AD+CVD+SG)	TTBD database

Table 3: Temporary Protection Measures and Tariff Overhangs – Logit Model Results (Average Marginal Effects)

Dependent Variable: Temporary Protection Measure (1: Yes, 0: No)	6-digit (1) TP	6-digit (2) TP	6-digit (3) TP	6-digit (4) TP	6-digit (5) AD	6-digit (6) CVD	6-digit (7) SG	2-digit (8) TP	4-digit (9) TP
Overhang_{t-1}	-0.0134***	-0.0145***	-0.0152***	-0.0146***	-0.0096***	-0.0186***	-0.0351***	-0.0396*	-0.0170***
	(0.0036)	(0.0037)	(0.0038)	(0.0037)	(0.0024)	(0.0061)	(0.0131)	(0.0207)	(0.0042)
$\log(\text{Imports})_{t-1}$		0.0014***		0.0014***	0.0013***	0.0010***	0.0010***	-0.0014	0.0042***
		(0.0001)		(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0104)	(0.0003)
$\text{PTAImportShare}_{t-1}$		0.0001	0.0005	0.0001	-0.0001	-0.0016***	0.0010	-0.0108	-0.0001
		(0.0005)	(0.0005)	(0.0005)	(0.0006)	(0.0005)	(0.0008)	(0.0123)	(0.0011)
$\log(\text{WorldImportShare})_{t-1}$		-0.0004***	0.0010***	-0.0004***	-0.0003***	-0.0003**	-0.0000	0.0209**	-0.0012***
		(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0105)	(0.0003)
$\text{Overhang}_{t-1} \times \text{PTAImportShare}_{t-1}$				0.0053					
				(0.0038)					
Observations	1,449,353	1,449,353	1,449,353	1,449,353	1,357,528	323,354	325,275	22,150	363,687
Pseudo R2	0.210	0.239	0.221	0.239	0.196	0.231	0.388	0.287	0.210
Country-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2-digit HS FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The table presents average marginal effects from logit model regressions. Clustered standard errors at the country/2-digit HS level are in parentheses. ***, ** and * indicate 1 percent, 5 percent and 10 percent significance levels, respectively. Specification (4) reports the respective composite effects for Overhang_{t-1} and $\text{PTAImportShare}_{t-1}$, taking into account the interaction between both variables.

Table 4: Temporary Protection Measures and Tariff Overhangs – Linear Probability Model Results

Dependent Variable: Temporary Protection Measure (1: Yes, 0: No)	6-digit (10) TP	6-digit (11) TP	6-digit (12) TP	6-digit (13) TP	6-digit (14) AD	6-digit (15) CVD	6-digit (16) SG	2-digit (17) TP	4-digit (18) TP	6-digit (19) TP
Overhang_{t-1}	-0.0077***	-0.0078***	-0.0083***	-0.0077***	-0.0052***	-0.0084**	-0.0131**	-0.0394***	-0.0112***	-0.0047***
	(0.0024)	(0.0023)	(0.0023)	(0.0023)	(0.0015)	(0.0037)	(0.0057)	(0.0146)	(0.0025)	(0.0014)
$\log(\text{Imports})_{t-1}$		0.0013***		0.0013***	0.0011***	0.0008***	0.0010***	-0.0008	0.0032***	0.0009***
		(0.0001)		(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0081)	(0.0002)	(0.0001)
$\text{PTAImportShare}_{t-1}$		0.0004	0.0007	0.0004	-0.0001	-0.0014**	0.0020**	-0.0074	-0.0003	0.0001
		(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0006)	(0.0010)	(0.0082)	(0.0009)	(0.0004)
$\log(\text{WorldImportShare})_{t-1}$		-0.0005***	0.0008***	-0.0005***	-0.0005***	-0.0004***	-0.0000	0.0102	-0.0015***	-0.0004***
		(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0080)	(0.0002)	(0.0001)
$\text{Overhang}_{t-1} \times \text{PTAImportShare}_{t-1}$				0.0044*						
				(0.0026)						
Observations	1,449,353	1,449,353	1,449,353	1,449,353	1,357,528	323,354	325,275	22,150	363,687	2,150,648
R2	0.0202	0.0216	0.0207	0.0216	0.0127	0.0103	0.0446	0.1535	0.0224	0.0197
Country-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2-digit HS FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The table presents linear probability model regression results. Clustered standard errors at the country/2-digit HS level are in parentheses. ***, ** and * indicate 1 percent, 5 percent and 10 percent significance levels, respectively. Specification (13) reports the respective composite effects for Overhang_{t-1} and $\text{PTAImportShare}_{t-1}$, taking into account the interaction between both variables.

Table 5: Temporary Protection Measures and Tariff Overhangs – Accounting for Bound Tariffs

	Logit Model		Linear Probability Model	
Dependent Variable:	6-digit	6-digit	6-digit	6-digit
Temporary Protection Measure	(20)	(21)	(22)	(23)
(1: Yes, 0: No)	TP	TP	TP	TP
Overhang_{t-1}	-0.0159***	-0.0189***	-0.0090***	-0.0127***
	(0.0036)	(0.0040)	(0.0023)	(0.0040)
BoundTariff_{t-1}	0.0018**	0.0018	0.0014	0.0018
	(0.0009)	(0.0018)	(0.0014)	(0.0013)
Overhang_{t-1}		0.0128***		0.0107*
$\times\text{BoundTariff}_{t-1}$		(0.0049)		(0.0062)
$\log(\text{Imports})_{t-1}$	0.0014***	0.0014***	0.0013***	0.0013***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
$\text{PTAImportShare}_{t-1}$	0.0001	0.0001	0.0004	0.0004
	(0.0005)	(0.0005)	(0.0006)	(0.0006)
$\log(\text{WorldImportShare})_{t-1}$	-0.0004***	-0.0004***	-0.0005***	-0.0005***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Observations	1,449,353	1,449,353	1,449,353	1,449,353
R2 (Pseudo R2)	0.239	0.240	0.0216	0.0216
Country-year FE	Yes	Yes	Yes	Yes
2-digit HS FE	Yes	Yes	Yes	Yes

Notes: Columns (20) and (21) in the table present average marginal effects from logit model regressions and columns (22) and (23) show linear probability model regression results. Clustered standard errors at the country/2-digit HS level are in parentheses. ***, ** and * indicate 1 percent, 5 percent and 10 percent significance levels, respectively. Specifications (21) and (23) report the respective composite effects for Overhang_{t-1} and BoundTariff_{t-1}, taking into account the interaction between both variables.

Table 6: Temporary Protection Measures and Tariff Overhangs – Subsample Results

	Logit Model				Linear Probability Model			
Sample Restriction	TP>25	TP>75	TP>150	TP<500	TP>25	TP>75	TP>150	TP<500
Dependent Variable:	6-digit	6-digit	6-digit	6-digit	6-digit	6-digit	6-digit	6-digit
Temporary Protection Measure	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)
(1: Yes, 0: No)	TP	TP	TP	TP	TP	TP	TP	TP
Overhang_{t-1}	-0.0163***	-0.0214***	-0.0297***	-0.0057***	-0.0088***	-0.0127***	-0.0167***	-0.0039***
	(0.0042)	(0.0055)	(0.0068)	(0.0017)	(0.0028)	(0.0038)	(0.0046)	(0.0014)
$\log(\text{Imports})_{t-1}$	0.0015***	0.0016***	0.0018***	0.0011***	0.0014***	0.0015***	0.0017***	0.0010***
	(0.0001)	(0.0001)	(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
$\text{PTAImportShare}_{t-1}$	0.0001	0.0001	0.0002	-0.0004	0.0006	0.0007	0.0008	0.0001
	(0.0006)	(0.0007)	(0.0008)	(0.0004)	(0.0007)	(0.0008)	(0.0010)	(0.0004)
$\log(\text{WorldImportShare})_{t-1}$	-0.0004***	-0.0005***	-0.0005***	-0.0002**	-0.0005***	-0.0005***	-0.0006***	-0.0003***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Observations	1,300,055	1,169,794	945,788	1,135,990	1,300,055	1,169,794	945,788	1,135,990
R2 (Pseudo R2)	0.234	0.232	0.238	0.217	0.022	0.023	0.025	0.013
Country-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2-digit HS FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Columns (24)–(27) in the table present average marginal effects from logit model regressions and columns (28)–(31) show linear probability model regression results. Clustered standard errors at the country/2-digit HS level are in parentheses. ***, ** and * indicate 1 percent, 5 percent and 10 percent significance levels, respectively.

Table 7: Temporary Protection Measures and Tariff Overhangs – Additional Determinants (Logit Model Results)

Dependent Variable: Temporary Protection Measure (1: Yes, 0: No)	6-digit (32) TP	6-digit (33) TP	6-digit (34) TP	6-digit (35) TP	6-digit (36) TP	6-digit (37) TP	6-digit (38) TP	6-digit (39) TP
Overhang_{t-1}	-0.0148***	-0.0184***	-0.0123***	-0.0146***	-0.0140***	-0.0139***	-0.0125***	-0.0148***
	(0.0038)	(0.0046)	(0.0034)	(0.0037)	(0.0037)	(0.0037)	(0.0032)	(0.0039)
$\Delta\log(\text{Imports})_{t-1}$, 3 years	-0.0001	0.0000						0.0000
	(0.0001)	(0.0001)						(0.0001)
1/[IM + EX Elasticities]		-0.0005						-0.0005
		(0.0004)						(0.0003)
$\Delta\text{AppliedTariff}_{t-1}$, 3 years			-0.0012					-0.0052
			(0.0044)					(0.0044)
TP Retaliation_{t-1}, 2-digit				0.0007				
				(0.0005)				
TP Retaliation_{t-1}, 6-digit					0.0042***			0.0036***
					(0.0007)			(0.0009)
AD Retaliation_{t-1}, 6-digit						0.0037***		
						(0.0009)		
CVD Retaliation_{t-1}, 6-digit						0.0004		
						(0.0012)		
SG Retaliation_{t-1}, 6-digit						0.0040***		
						(0.0008)		
Past TP_{t-1}, 3 years							0.0072***	0.0076***
							(0.0005)	(0.0007)
$\log(\text{Imports})_{t-1}$	0.0014***	0.0015***	0.0014***	0.0014***	0.0014***	0.0014***	0.0012***	0.0013***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
$\text{PTAImportShare}_{t-1}$	0.0002	0.0002	0.0001	0.0002	0.0001	0.0001	0.0001	0.0002
	(0.0006)	(0.0007)	(0.0006)	(0.0005)	(0.0005)	(0.0005)	(0.0005)	(0.0007)
$\log(\text{WorldImportShare})_{t-1}$	-0.0004***	-0.0004***	-0.0003***	-0.0004***	-0.0003***	-0.0003***	-0.0003***	-0.0002**
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Observations	1,325,131	1,194,790	1,066,620	1,449,353	1,449,353	1,449,353	1,449,353	924,525
Pseudo R2	0.236	0.228	0.245	0.239	0.244	0.244	0.259	0.262
Country-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2-digit HS FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The table presents average marginal effects from logit model regressions. Clustered standard errors at the country/2-digit HS level are in parentheses. ***, ** and * indicate 1 percent, 5 percent and 10 percent significance levels, respectively. Specifications (33) and (39) report the respective composite effects for $\Delta\log(\text{Imports})_{t-1}$, 3 years and 1/[IM + EX Elasticities], taking into account the interaction between both variables.

Table 8: Temporary Protection Tariffs and Tariff Overhangs (Logit Model Results)

Dependent Variable: Temporary Protection Tariff (1: Yes, 0: No)	6-digit (40) TP	6-digit (41) TP	6-digit (42) TP	6-digit (43) TP	6-digit (44) TP	6-digit (45) TP	6-digit (46) TP	6-digit (47) TP
Overhang_{t-1}	-0.0139***	-0.0150***	-0.0089***	-0.0136***	-0.0131***	-0.0131***	-0.0113***	-0.0088***
	(0.0039)	(0.0044)	(0.0028)	(0.0038)	(0.0038)	(0.0038)	(0.0030)	(0.0028)
$\Delta\log(\text{Imports})_{t-1}$, 3 years	-0.0004***	-0.0004**						-0.0002*
	(0.0002)	(0.0002)						(0.0001)
1/[IM + EX Elasticities]		-0.0007*						-0.0008**
		(0.0004)						(0.0004)
$\Delta\text{AppliedTariff}_{t-1}$, 3 years			0.0085***					0.0072**
			(0.0028)					(0.0031)
TP Retaliation_{t-1}, 2-digit				0.0009*				
				(0.0005)				
TP Retaliation_{t-1}, 6-digit					0.0033***			0.0034***
					(0.0007)			(0.0008)
AD Retaliation_{t-1}, 6-digit						0.0020**		
						(0.0009)		
CVD Retaliation_{t-1}, 6-digit						-0.0007		
						(0.0023)		
SG Retaliation_{t-1}, 6-digit						0.0036***		
						(0.0007)		
Past TP Tariff_{t-1}, 3 years							0.0067***	0.0069***
							(0.0005)	(0.0006)
$\log(\text{Imports})_{t-1}$	0.0013***	0.0014***	0.0012***	0.0013***	0.0012***	0.0012***	0.0011***	0.0011***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
$\text{PTAImportShare}_{t-1}$	-0.0001	-0.0001	-0.0002	-0.0002	-0.0003	-0.0003	-0.0003	-0.0005
	(0.0005)	(0.0005)	(0.0005)	(0.0004)	(0.0004)	(0.0004)	(0.0004)	(0.0005)
$\log(\text{WorldImportShare})_{t-1}$	-0.0003***	-0.0004***	-0.0003***	-0.0004***	-0.0003***	-0.0003***	-0.0003***	-0.0002*
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Observations	1,139,459	1,030,086	921,019	1,237,035	1,237,035	1,237,035	1,237,035	809,210
Pseudo R2	0.230	0.226	0.229	0.232	0.235	0.236	0.255	0.256
Country-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2-digit HS FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The table presents average marginal effects from logit model regressions. Clustered standard errors at the country/2-digit HS level are in parentheses. ***, ** and * indicate 1 percent, 5 percent and 10 percent significance levels, respectively. Specifications (41) and (47) report the respective composite effects for $\Delta\log(\text{Imports})_{t-1}$, 3 years and 1/[IM + EX Elasticities], taking into account the interaction between both variables.

Table 9: Temporary Protection and Tariff Overhangs – Negative Binomial Model Results

Dependent Variable: Temporary Protection Measure Count	TP Type Count (48)	TP Type Count (49)	TP Product Count (50)	TP Product Count (51)	TP Affected Country Count (52)	TP Affected Country Count (53)
Overhang_{t-1}	-0.0167***	-0.0169***	-0.0599***	-0.0644***	-0.0472***	-0.0788***
	(0.0039)	(0.0043)	(0.0136)	(0.0166)	(0.0107)	(0.0211)
$\Delta\log(\text{Imports})_{t-1}$, 3 years		0.0000		-0.0008		-0.0011
		(0.0001)		(0.0006)		(0.0007)
1/[IM + EX Elasticities]		-0.0005		-0.0028*		-0.0052**
		(0.0004)		(0.0017)		(0.0025)
$\Delta\text{AppliedTariff}_{t-1}$		-0.0068		-0.0510**		-0.0817**
		(0.0048)		(0.0232)		(0.0338)
$\text{TP Retaliation}_{t-1}$, 6-digit		0.0041***		0.0187***		0.0274***
		(0.0008)		(0.0037)		(0.0061)
Past TP_{t-1}, 3 years		0.0081***		0.0490***		0.0664***
		(0.0008)		(0.0096)		(0.0142)
$\log(\text{Imports})_{t-1}$	0.0018***	0.0015***	0.0113***	0.0112***	0.0090***	0.0136***
	(0.0002)	(0.0002)	(0.0017)	(0.0019)	(0.0014)	(0.0027)
$\text{PTAImportShare}_{t-1}$	-0.0003	0.0001	-0.0075***	-0.0057*	-0.0048**	-0.0066*
	(0.0006)	(0.0007)	(0.0028)	(0.0031)	(0.0022)	(0.0040)
$\log(\text{WorldImportShare})_{t-1}$	-0.0005***	-0.0003**	-0.0042***	-0.0037***	-0.0024***	-0.0024***
	(0.0001)	(0.0001)	(0.0009)	(0.0010)	(0.0006)	(0.0009)
Observations	1,449,353	924,525	1,449,353	924,525	1,449,353	924,525
Pseudo R2	0.212	0.236	0.164	0.163	0.162	0.166
Country-year FE	Yes	Yes	Yes	Yes	Yes	Yes
2-digit HS FE	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The table presents average marginal effects from negative binomial model regressions. Clustered standard errors at the country/2-digit HS level are in parentheses. ***, ** and * indicate 1 percent, 5 percent and 10 percent significance levels, respectively. Specifications (49), (51) and (53) report the respective composite effects for $\Delta\log(\text{Imports})_{t-1}$, 3 years and 1/[IM + EX Elasticities], taking into account the interaction between both variables.

Table 10: Temporary Protection and Tariff Overhangs – Logit Estimates by Industry

Dependent Variable: Temporary Protection Measure (1: Yes, 0: No)	Industry: Agriculture	Chemicals	Clothing	Manufactures	Materials	Metals
Overhang_{t-1}	-0.0083***	-0.0138***	0.0023	-0.0153***	-0.0156***	-0.0288***
	(0.0029)	(0.0051)	(0.0031)	(0.0053)	(0.0059)	(0.0058)

Notes: The table presents average marginal effects from a logit model regression of equation (3). The specification includes country-year and 2-digit HS fixed effects as well as controls for $\log(\text{Imports})_{t-1}$, $\text{PTAImportShare}_{t-1}$ and $\log(\text{WorldImportShare})_{t-1}$. Clustered standard errors at the country/2-digit HS level are in parentheses. ***, ** and * indicate 1 percent, 5 percent and 10 percent significance levels, respectively.

Appendix A: Additional Results

Table A1: Tariff Overhang Bins – Logit Model Results (Average Marginal Effects)

Dependent Variable: Temporary Protection Measure (1: Yes, 0: No)	6-digit (A1) TP	6-digit (A2) TP	6-digit (A3) TP	6-digit (A4) TP	6-digit (A5) AD	6-digit (A6) CVD	6-digit (A7) SG	2-digit (A8) TP	4-digit (A9) TP
$Overhang_{t-1}$: <20% (1:Yes, 0:No)	0.0050***	0.0056***	0.0052***	0.0058***	0.0043***	0.0066*	0.0079**	0.0194	0.0093***
	(0.0013)	(0.0013)	(0.0013)	(0.0013)	(0.0012)	(0.0037)	(0.0032)	(0.0124)	(0.0021)
$Overhang_{t-1}$: 20%to40% (1:Yes, 0:No)	0.0019	0.0024*	0.0020	0.0025*	0.0020	0.0054	0.0032	0.0109	0.0058***
	(0.0014)	(0.0013)	(0.0014)	(0.0014)	(0.0013)	(0.0042)	(0.0029)	(0.0123)	(0.0020)
$\log(Imports)_{t-1}$		0.0014***		0.0014***	0.0013***	0.0010***	0.0010***	-0.0015	0.0042***
		(0.0001)		(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0104)	(0.0003)
$PTAImportShare_{t-1}$		0.0001	0.0005	0.0001	-0.0001	-0.0016***	0.0010	-0.0100	-0.0001
		(0.0005)	(0.0005)	(0.0005)	(0.0006)	(0.0005)	(0.0009)	(0.0124)	(0.0011)
$\log(WorldImportShare)_{t-1}$		-0.0004***	0.0010***	-0.0004***	-0.0004***	-0.0003**	-0.0001	0.0209**	-0.0012***
		(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0105)	(0.0003)
$Overhang_{t-1}$: <20% $\times PTAImportShare_{t-1}$				0.0032					
				(0.0025)					
$Overhang_{t-1}$: 20%to40% $\times PTAImportShare_{t-1}$				0.0044*					
				(0.0026)					
Observations	1,449,353	1,449,353	1,449,353	1,449,353	1,357,528	323,354	325,275	22,150	363,687
Pseudo R2	0.211	0.239	0.221	0.239	0.197	0.226	0.383	0.287	0.210
Country-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2-digit HS FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The table presents average marginal effects from logit model regressions. Clustered standard errors at the country/2-digit HS level are in parentheses. ***, ** and * indicate 1 percent, 5 percent and 10 percent significance levels, respectively. Specification (A4) reports the respective composite effects for $Overhang_{t-1}$: <20%, $Overhang_{t-1}$: 20%to40% and $PTAImportShare_{t-1}$, taking into account the interactions between the former two variables and $PTAImportShare_{t-1}$.

Table A2: Fixed Effects and Clustering Sensitivity – Linear Probability Model Results

Dependent Variable: Temporary Protection Measure (1: Yes, 0: No)	6-digit (A10) TP	6-digit (A11) TP	6-digit (A12) TP	6-digit (A13) TP	6-digit (A14) TP	6-digit (A15) TP	6-digit (A16) TP	6-digit (A17) TP
Overhang_{t-1}	-0.0080***	-0.0079***	-0.0050***	-0.0051***	-0.0078***	-0.0078***	-0.0078***	-0.0078***
	(0.0024)	(0.0024)	(0.0013)	(0.0013)	(0.0016)	(0.0009)	(0.0011)	(0.0005)
$\log(\text{Imports})_{t-1}$	0.0012***	0.0002	0.0014***	0.0014***	0.0013***	0.0013***	0.0013***	0.0013***
	(0.0001)	(0.0003)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
$\text{PTAImportShare}_{t-1}$	0.0003	0.0001	-0.0006*	-0.0004	0.0004	0.0004	0.0004	0.0004*
	(0.0006)	(0.0007)	(0.0003)	(0.0003)	(0.0005)	(0.0003)	(0.0003)	(0.0002)
$\log(\text{WorldImportShare})_{t-1}$	-0.0005***	0.0006*	-0.0007***	-0.0008***	-0.0005***	-0.0005***	-0.0005***	-0.0005***
	(0.0001)	(0.0003)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Observations	1,449,353	1,449,351	1,449,161	1,362,446	1,449,353	1,449,353	1,449,353	1,449,353
Pseudo R2	0.0285	0.0331	0.2375	0.5591	0.0216	0.0216	0.0216	0.0216
Fixed effects	HS4 + ct	HS6 + ct	HS2 x ct	HS4 x ct	HS2 + ct	HS2 + ct	HS2 + ct	HS2 + ct
Clustering level	HS2 x c	HS2 x c	HS2 x c	HS2 x c	HS2 x ct	HS4 x ct	HS4 x c	HS6 x c

Notes: The table presents linear probability model regression results. ***, ** and * indicate 1 percent, 5 percent and 10 percent significance levels, respectively.

Appendix B: Data

Sample Composition: As mentioned in the main text, the baseline sample consists of the overlap between the tariff information in the World Bank's TRAINS and TTBD databases at the 6-digit HS level. The former can be accessed through the WITS system: http://wits.worldbank.org/wits/. The TTBD database can be downloaded from the data catalog of the World Bank: https://datacatalog.worldbank.org/dataset/temporary-trade-barriers-database-including-global-antidumping-database. When their MFN tariff data is available, WTO members are included in the sample if they initiated at least one TP investigation during the period 1996-2014. The start of the sample period is determined by the fact that consistent bound and applied MFN tariff data at the 6-digit HS level are not available before 1995. At the time of writing, the coverage of TP measures in the TTBD database ended in 2014. The baseline specification in Table 3 also requires import data (in logs) at the 6-digit HS level. Hence, sectors with missing or zero imports are also dropped from the analysis. The sample also excludes the one percent of sectors with the largest tariff overhangs, which limits the data to HS 6-digit sectors with tariff overhangs of 100 percent or less.

Tariff Overhangs: To obtain the baseline HS 6-digit tariff overhang measure, $Overhang_{ic,t-1}$ in equation (1), I proceed in two steps. I first obtain from the TRAINS database for each WTO member (if available) the simple averaged bound and MFN applied tariff data at the HS 6-digit level (based on the combined HS nomenclature). The tariff data excludes non-tariff measures; see footnote 15. I then construct the sectoral tariff overhangs by subtracting the MFN applied tariff from the bound tariff. The corresponding tariff overhang measures at the HS 2-digit and 4-digit levels are calculated using simple averages of the bound and applied MFN tariff rates at these aggregation levels instead.

Temporary Protection Measure: The baseline temporary protection measure, TP_{ict} in equation (1), is a binary variable that takes the value one if an importing country initiated one or more temporary protection investigations in the 6-digit HS sector at hand in a given year. Otherwise, TP_{ict} takes the value zero. Note that this measure aggregates TP activity across multiple exporters and underlying HS 8-digit or 10-digit sectors. The 2-digit and 4-digit HS measures used in Table 3 and Table 4 follow a similar aggregation procedure.

Temporary Protection Tariff: The temporary protection tariff measure employed in Table 8 is a binary variable that takes the value one if in a given year the importing country imposed an actual temporary protection tariff in the respective HS 6-digit sector. Otherwise, TP_{ict} takes the value zero. As mentioned in the main text, about 73 percent of all initiated TP investigations in the sample eventually result in the imposition of a temporary protection tariff. Note that this measure aggregates TP tariff activity across multiple exporters and underlying HS 8-digit or 10-digit sectors.

TP Type Count: The *TP Type Count* measure in Table 9 is a count variable that captures how many distinct TP measures an importing country imposes in a respective 6-digit HS sector in a given year. The measure takes the value zero if no TP action was initiated. The variables takes the value one if at least one TP investigation of the same type (AD or CVD or SG) was initiated. The *TP Type Count* equals two if at least one TP investigation of two distinct types (e.g., AD and SG, or AD and CVD) were launched. Finally, the measure takes the value three if TP investigations of each type (AD, SG and CVD) got under way in a given 6-digit sector. Note that this measure aggregates TP types across multiple exporters and underlying HS 8-digit or 10-digit sectors.

TP Product Count: Many entries of the TTBD database refer to products under investigation at the 8-digit or 10-digit HS level. The *TP Product Count* variable in Table 9 is a count measure that counts how many TP investigations are initiated at the 8-digit or 10-digit level within a given 6-digit sector. For instance, in 1999, Canada initiated an AD investigation against the US concerning 'combined refrigerator-freezers, fitted with separate external doors' citing two 10-digit HS codes: 8418109021 and 8418109022. For the 6-digit HS code 841810, the *TP Product Count* variable then takes on the value two. In the sample, on average, 4.3 8- or 10-digit HS codes are under investigation per 6-digit HS sector with initiated TP proceedings.

TP Affected Country Count: The *TP Affected Country Count* variable in Table 9 is a count measure that captures how many exporters are targeted in a given TP investigation in a respective HS 6-digit sector and year. That is, this variable accounts for how broadly in terms of country coverage a TP measure is actually applicable. For instance, in 2002, Mexico initiated an AD investigation against Colombia, Ecuador and Indonesia regarding the import of ceramic dishes (HS 6-digit code 691200). In this case, the *TP Affected Country Count* variable for that sector takes on the value three in 2002 as that number of countries is targeted with the TP action. In the sample, the average number of affected countries by TP investigations in a given HS 6-digit sector is 3.2. Note that in the case of safeguards the count is restricted to countries in the sample that exhibit positive exports to the importer in a given HS 6-digit sector.