Online Appendix
Democracy and Trade Policy at the Product Level: Evidence from a New Tariff-line Dataset*

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S1 Product-level Tariff Dataset

S1.1 Bilateral Tariff Data Collection and Processing

A tariff-line is a numeric code that each importer uses to identify a unique product. For a given product, tariff-lines can differ from country to country; however, the first six digits of the tariff-line are internationally standardized under the Harmonized System.

There are two existing sources of tariff-line data: the WTO's Integrated Database (IDB), publicly accessible at the WTO's public Tariff Analysis Online (TAO) facility, and UNCTAD's Trade Analysis Information System (TRAINS), publicly accessible at the World Bank's World Integrated Trade Solution (WITS) website.[1] Together they form a comprehensive collection of ad valorem

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[1] TAO's URL is http://tao.wto.org, and WITS's URL is http://wits.worldbank.org

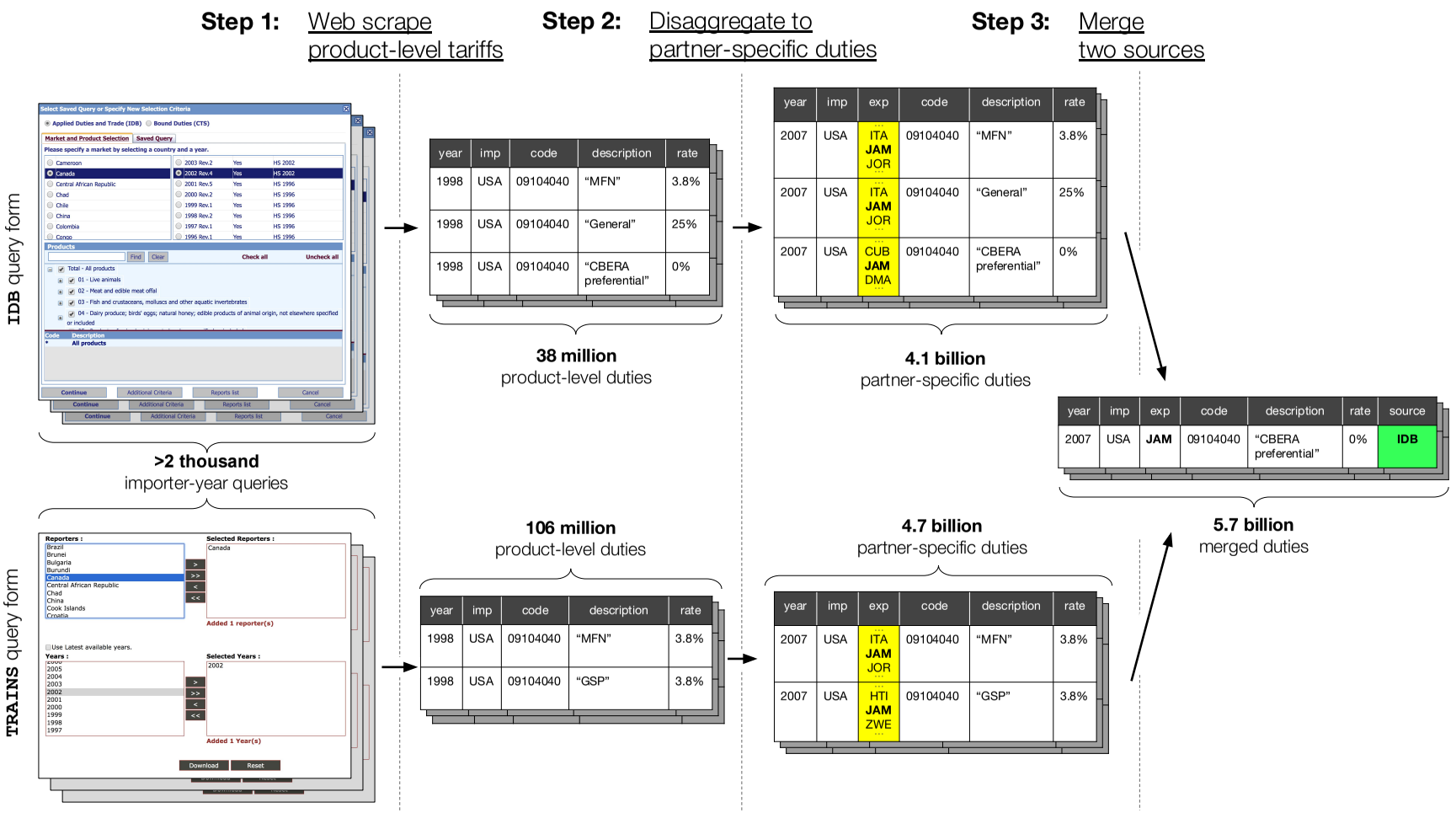


Figure S1: **Tariff-line Dataset Creation.** This figure illustrates the process of creating our industry-level partner-specific tariff dataset. As an example, we show how we produce the 1998 U.S. duty on Jamaican imports of Ginger, saffron, turmeric (curcuma), thyme, bay leaves, curry and other spices (HTS subheading `09104040`). First, we scrape tariffs across all available importers and years using the public web forms for IDB and TRAINS. Then, we use the tariff beneficiary description (shown as `description`) to find all tariffs whose beneficiary group includes Jamaica. As shown, each database is missing a duty that the other contains. IDB contains an MFN duty, a general duty, and a preferential duty, but not the GSP duty; TRAINS contains a MFN duty and a GSP duty, but not the preferential duty. Finally, to select the duty among these candidates that is most likely applied in practice, we use a custom merging algorithm described in Appendix S1.2. In this case, Jamaica enjoys a zero tariff due to a preferential Caribbean Basin Economic Recovery Act (CBERA) duty, which supersedes both the MFN and GSP rates.

and non-ad valorem tariff rates across all WTO countries and Harmonized System products from 1988 to the present.

To compile this universe of tariffs, we first web-scrape tariff-lines for all available importers and years. An observation in this dataset is a tariff imposed in a given year by an importer on a product imported from a country (e.g. Republic of Korea) or a group of countries (e.g. NAFTA, Mercosur, WTO members). Where the tariff affects a group of countries, we identify the members of the group and expand the observation so that each new observation is a dyad with an importer and exporter. Finally, for each resulting (year, importer, exporter, tariff-line) we compare duties from IDB and TRAINS to select the most likely applied duty using the algorithm detailed in Appendix S1.2.

Figure S1 illustrates the data collection, processing, and merging steps in our tariff dataset creation using an example United States tariff-line. The next sections detail each of these steps for IDB and TRAINS respectively. To further clarify each step, we use a recurring example tariff-line: The United State's (USA) 2013 tariff on HS product `62011330` (Overcoats, raincoats, car-coats, capes, cloaks and similar articles) from South Africa (ZAF). Notably, this particular tariff-line is a beneficiary of the African Growth and Opportunity Act (AGOA) enacted by the U.S. in 2000.

S1.1.1 WTO IDB Duty Collection and Processing

We perform the following steps to collect and process IDB duties:

Step 1. (Web scrape product-level duties) For each year and importer, we scrape all IDB product-level applied tariffs available through WTO's public Tariff Analysis Online (TAO) facility. Each duty is identified by its year, importer, and Harmonized System product code and contains information on its specific beneficiary group as well as the rate applied. E.g.

Year	Imp.	Code	Full description	Type	Reported rate
2013	USA	`62011330`	"MFN applied duty rate"	02	49.7 cents/kg + 19.7%
2013	USA	`62011330`	"General duty rate"	80	52.9 cents/kg + 58.5%

We acquire two different reported duties from IDB for American imports of overcoat-like apparels from WTO countries (including South Africa) in 2013.

Step 2. (Parse compound and mixed tariff rates) In IDB, all tariff-lines with compound or mixed rates (rates that have both an ad valorem and non ad valorem component) have a `NULL` in the field for the numerical duty rate. Rather than discarding these complex tariffs,

Year	Imp.	Code	Full description	Type	Reported rate (≈ imputed AVE)
2013	USA	62011330	"MFN applied duty rate"	02	49.7 cents/kg + 19.7% (≈ **19.7**%)
2013	USA	62011330	"General duty rate"	80	52.9 cents/kg + 58.5% (≈ **58.5**%)

we parse the ad valorem component from the reported rate text and use it as a approximation of the full duty rate. E.g.

We now have an approximate 'ad valorem equivalent' rate imputed for these and all other IDB mixed/compound duty rates.

Step 3. (Disaggregate duty beneficiaries to countries) Each duty has a type field and description field that uniquely indicates its specific beneficiary which may be a country (e.g. `Preferential rate for Canada`), members of an agreement (e.g. `North-American Free Trade Agreement`), or a group of countries (e.g. `G16`). We use a mix of hand-coding from official materials and string matching with country names and regional trade agreement titles in order to map each duty type appearing in IDB data to its respective set of countries. [2] E.g.

Year	Imp.	Exp.	Code	Full description	Type	Reported rate (≈ imputed AVE)
2013	USA	**ZAF**	62011330	"MFN applied duty rate"	02	49.7 cents/kg + 19.7% (≈ 19.7%)
2013	USA	**ZAF**	62011330	"General duty rate"	80	52.9 cents/kg + 58.5% (≈ 58.5%)

We find that both IDB duty types stipulate South Africa as a beneficiary.

S1.1.2 UNCTAD TRAINS Duty Collection and Processing

Likewise, we perform the following corresponding steps for TRAINS tariffs:

Step 1. (Web scrape product-level duties) For each year, we scrape all TRAINS product-level tariffs available through the WITS web site. E.g.

Year	Imp.	Code	Full description	Type	Reported rate (≈ UNCTAD AVE)
2013	USA	62011330	"Most Favoured Nation duty rate treatment"	002	49.7 cents/kg + 19.7% (≈ 21.22%)
2013	USA	62011330	"AGOA preference on certain textiles and apparel for eligible countries"	051	0.0%

[2] We use official preference beneficiaries for many tariff measures from `https://wits.worldbank.org/WITS/WITS/Support+Materials/TrfMeasures.aspx?Page=TfMeasures`. We map beneficiaries of regional trade agreements from the Regional Trade Agreements Information System (RTA-IS) publicly accessible at `https://rtais.wto.org`.

We find two different duties applicable to 2013 American imports of HS product `62011330` from South Africa. Unlike IDB however, TRAINS reports a preferential rate (AGOA). Also unlike IDB, TRAINS provides its own ad valorem equivalent (`21.22%`) for the compound MFN tariff (`49.7 cents/kg + 19.7%`).

Step 2. (Disaggregate duty beneficiaries to countries) Using a combination of a region-to-countries mapping and a type-to-countries mapping, both provided by the World Bank, we expand each beneficiary-level duty to its disaggregated partner-specific duties. E.g.

Year	Imp.	Exp.	Code	Full description	Type	Reported rate (≈ UNCTAD AVE)
2013	USA	**ZAF**	`62011330`	"Most Favoured Nation duty rate treatment"	002	49.7 cents/kg + 19.7% (≈ 21.22%)
2013	USA	**ZAF**	`62011330`	"AGOA preference on certain textiles and apparel for eligible countries"	051	0.0%

Again, we find that both the duties found in TRAINS stipulate South Africa as a beneficiary.

Performing these procedures, we acquire 4.1 billion IDB and 4.7 billion TRAINS product-level partner-specific duties. However, as noted in our example, for each (year, importer, exporter, product) we may have multiple conflicting duties, of which only one is actually applied. In the next section, we describe the merging algorithm used to solve this problem.

S1.2 Tariff Merging Algorithm

A given (year, importer, exporter, industry) query may return multiple possible duties from the WTO IDB database and the UNCTAD TRAINS database. In some cases, both sources agree on an ad valorem rate, but TRAINS provides a more informative specific duty rate. In other cases, TRAINS correctly accounts for a compound or mixed rate while IDB does not. Moreover, for some years, one source correctly retrieves a newly enforced preferential rate while the other mistakenly reports previous years' Most Favored Nation (MFN) duty rate. Finally, for all non-ad valorem tariffs, TRAINS provides an ad valorem equivalent (AVE) rate using a custom statistical method that allows comparisons to be made between products with ad valorem and non-ad valorem rates. For such tariffs, IDB only provides the original non-ad valorem rate which is typically less informative for trade researchers.

The goal of the merging algorithm is to account for all of these cases in order to select the single most accurate and informative duty that an importer applies to a industry and partner in a given year. We illustrate how this is done using the previous example of United States' 2013 tariff on HS product `62011330` from South Africa. In this case, it is clear that United States, in practice, applies the preferential AGOA duty rate over the Most Favored Nation duty rate. Our algorithm correctly picks this rate in three steps:

Step 1. (Pick IDB candidate) If there are any preferential IDB duties for the given tariff-line, pick the preferential duty with the lowest rate. Otherwise, pick the non-preferential duty with the lowest rate. When picking from either set, sort duties using the ad valorem rate (or the imputed AVE in the case of mixed/compound tariffs); if no duties in the set have an ad valorem component, sort using the parsed specific rate. E.g.

Year	Imp.	Exp.	Code	Full description	Type	Reported rate (≈ imputed AVE)
2013	USA	ZAF	`62011330`	"MFN applied duty rates"	02	49.7 cents/kg + 19.7% (≈ 19.7%)
2013	USA	ZAF	`62011330`	"General duty rate"	80	52.9 cents/kg + 58.5% (≈ 58.5%)

In this case, since there are no preferential duties reported by IDB, we pick the lower of the non-preferential duties using the imputed AVE values.

Step 2. (Pick TRAINS candidate) If there are any preferential TRAINS duties for the given tariff-line, pick the preferential duty with the lowest rate. Otherwise, pick the non-preferential duty with the lowest rate. When picking from either set, sort duties using the ad valorem rate (either the reported ad valorem rate or the AVE imputed by UNCTAD). E.g.

Year	Imp.	Exp.	Code	Full description	Type	Reported rate (≈ UNCTAD AVE)
2013	USA	ZAF	`62011330`	"Most Favoured Nation duty rate treatment"	002	49.7 cents/kg + 19.7% (≈ 21.22%)
2013	USA	ZAF	`62011330`	"AGOA preference on certain textiles and apparel for eligible countries"	051	0.0%

Since there is only a single preferential duty, we select it as the best TRAINS candidate.

Step 3. (Select between candidates) Given the best IDB and TRAINS candidate duties, if one is preferential and the other is not, select the duty that is preferential. If both are either non-preferential or preferential and the TRAINS candidate has an imputed AVE, select the

TRAINS candidate. Otherwise, select the candidate with the lowest ad valorem rate. If either a TRAINS or IDB candidate could not be found, select the candidate that is available. E.g.

Year	Imp.	Exp.	Code	Original description	Final applied rate	Source
2013	USA	ZAF	62011330	"MFN applied duty rates"	49.7 cents/kg + 19.7% (≈ 19.7%)	IDB
2013	USA	ZAF	62011330	"AGOA preference on certain textiles and apparel for eligible countries"	0.0%	TRAINS

Since TRAINS provides a preferential rate and IDB does not, we select the TRAINS candidate as the applied duty for this tariff-line.

The result is a unique tariff for each (year, importer, exporter, product) query. In sum, this procedure merges 4.1 billion IDB duties with 4.7 billion TRAINS duties to produce 5.7 billion 'resolved' bilateral tariffs.[3] Figure S2 summarizes the coverage of the resulting tariff-line dataset for each WTO importer and year.

[3] We implement this procedure as a distributed SQL operation on the Hadoop big data ecosystem. Overall, this operation takes more than 72 hours to complete on a 10 node computing cluster (256 GB RAM per node, 24 CPU per node) and the resulting un-indexed dataset is more than 900 GB in size.

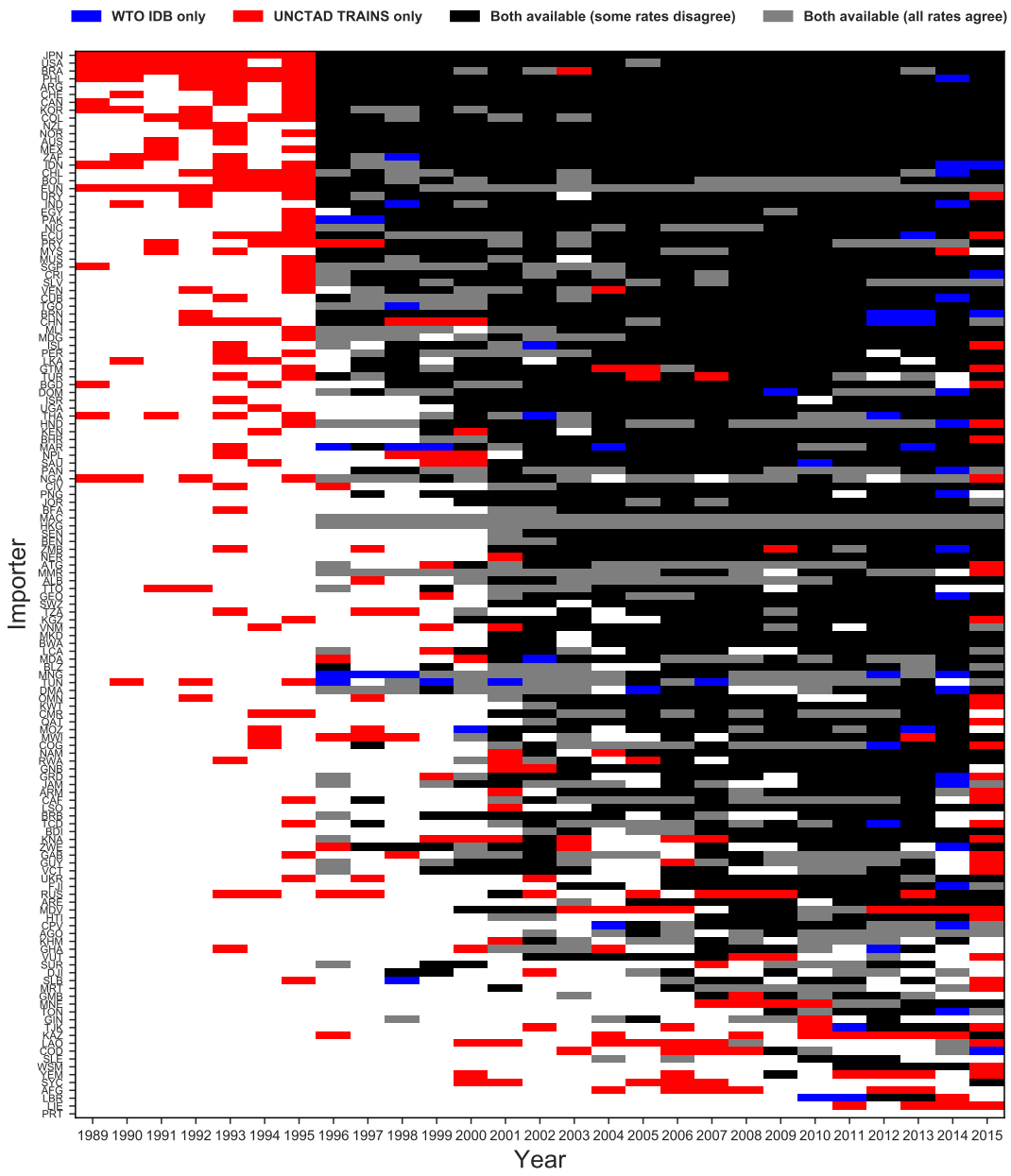


Figure S2: **Data Availability across Importers and Years.** This figure summarizes the availability of our data for each WTO importer and year. Although the large number of missing import-year observations from both primary sources (white cells) prevents our dataset from being fully comprehensive, it shows that our dataset covers tariff policies for all major participants of global trade (top 50 trading countries in volume) starting in 1995. Moreover, we make several improvements by combining data from the two available sources (red and blue cells) and resolving various discrepancies where the sources may conflict (black cells). Altogether, we compile 2,476 WTO importer-year tariff profiles (3,080 importer-year profiles overall) from the WTO Integrated Database (IDB) and the UNCTAD Trade Analysis Information System (TRAINS). As illustrated in this figure, less than 50% of these observations are available from both sources where the reported duty rates agree. Appendix S1.1 explains data collection and processing in detail.

S2 Computation

Our analysis requires substantial computational resources. For example, in the HS2 analysis, we examine 218,903 MFN rates (including 18,199 duty-free rates) for 127 countries over 26 years (1990 to 2015). We overcome computational challenges by estimating the parameters of the HS2 and HS4 models using the Hamiltonian Monte Carlo (HMC) method implemented in the Stan program (Carpenter et al., 2016).[4] For each of four imputed datasets, we run four separate Markov chains. Our posterior sample combines the chains from the imputed datasets. While we focus specifically on the posterior means and credible intervals of our quantity of interest when we present our findings below, we also make the entire posterior samples publicly available. Finally, for faster computation in the HS6 case, we use Variational Bayes (VB) instead of HMC (Jordan et al., 1999). We verify convergence of our models using the Gelman-Rubin statistic. To the best of our knowledge, this is the first product-level study that examines the relationships between regime type and MFN trade policy covering both developing and developed nations.

[4] HMC is an appropriate tool to deal with the complexity of our model, as the high dimensionality of the parameter space might result in inefficient mixing and severe autocorrelation if we used a Markov Chain Monte Carlo (MCMC) method (Betancourt, 2017). HMC explores the parameter space efficiently, making it possible to estimate parameter values with accuracy within a reasonable length of time.

S3 Alternative Specifications and Diagnostics

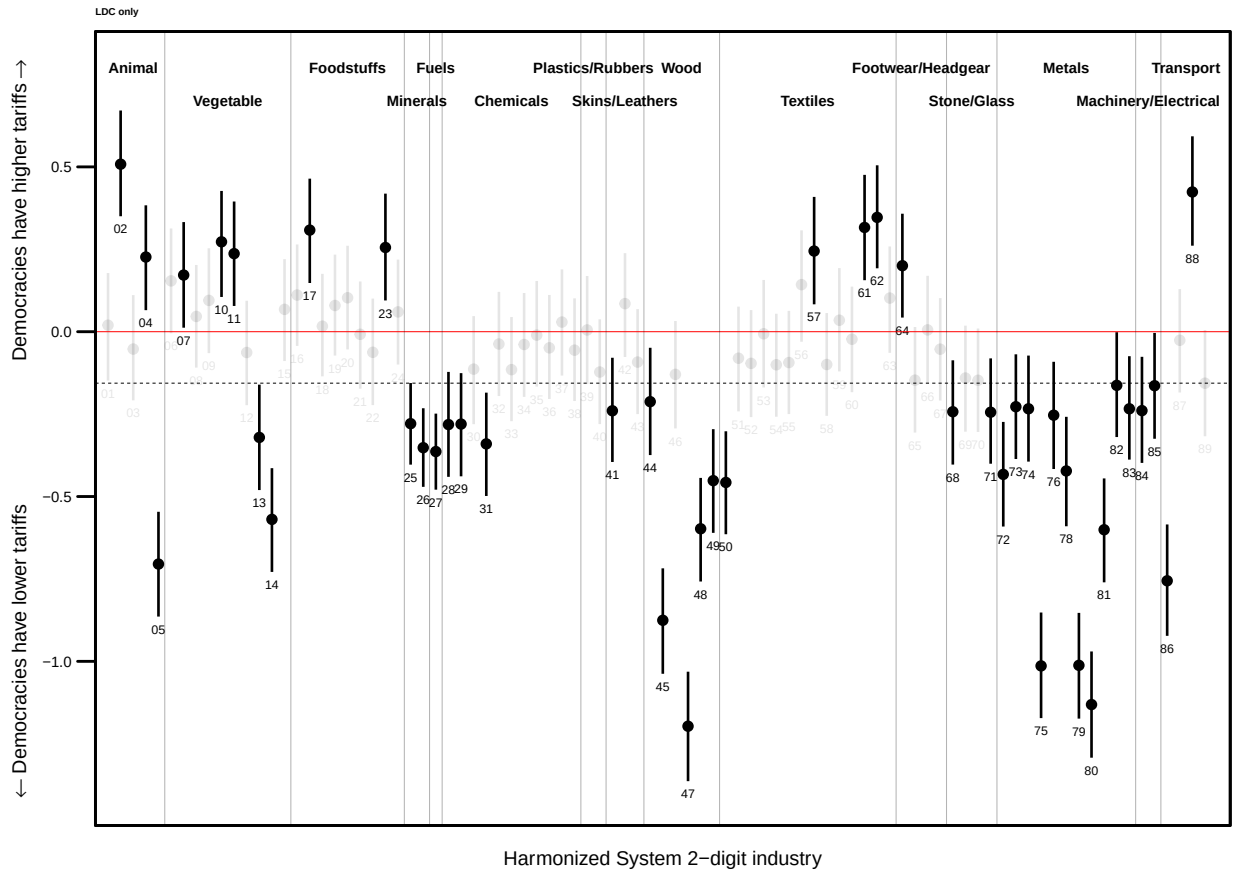
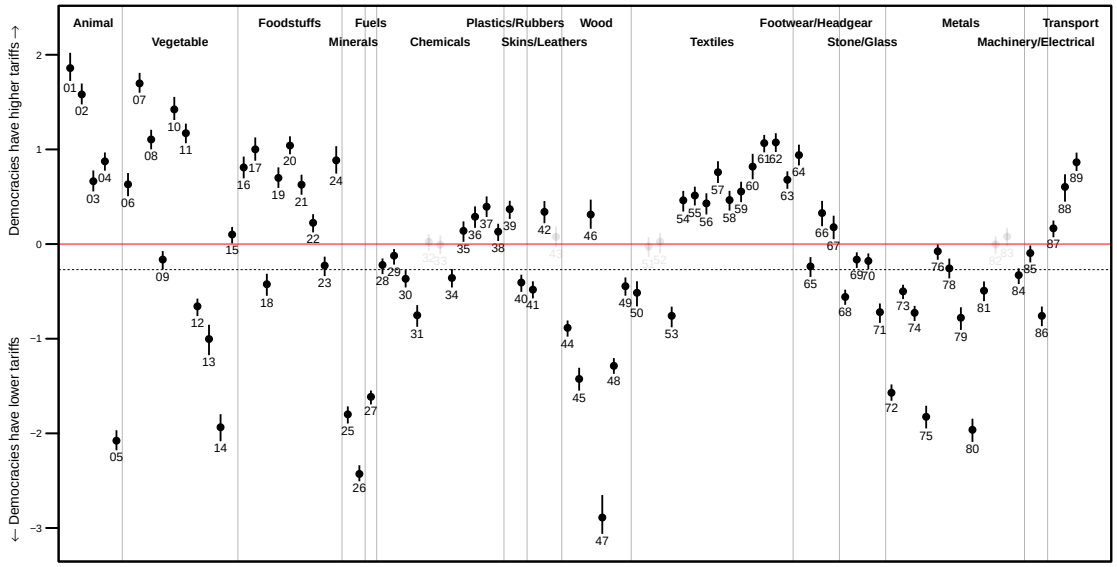
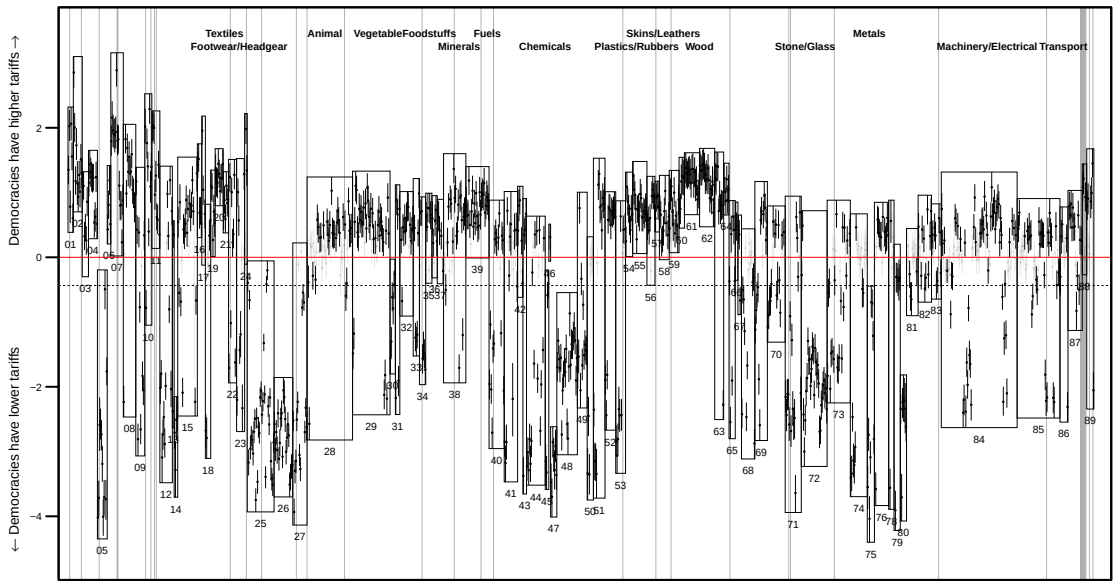


Figure S1: **Effect of Democracy on Log Tariffs, Less-Developed Countries.** This plot presents posterior means and 95% credible intervals for the estimated effects of democracy on trade policy for each HS2 industry. The Harmonized System 2-digit chapter codes are given at the bottom of each estimate.

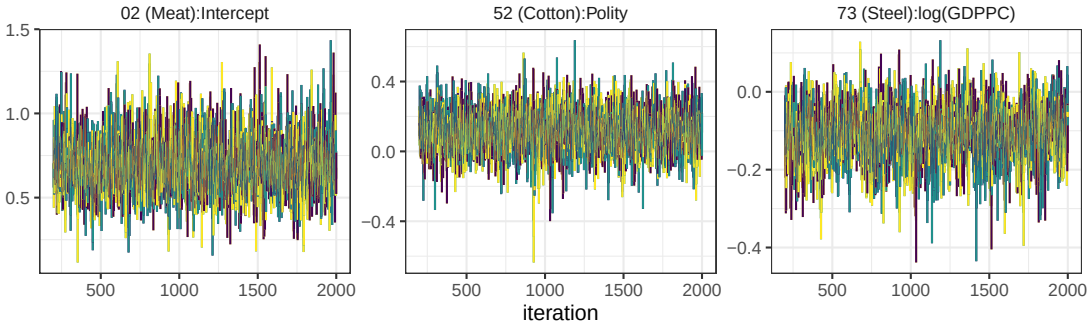


(a) HS 2-digit level

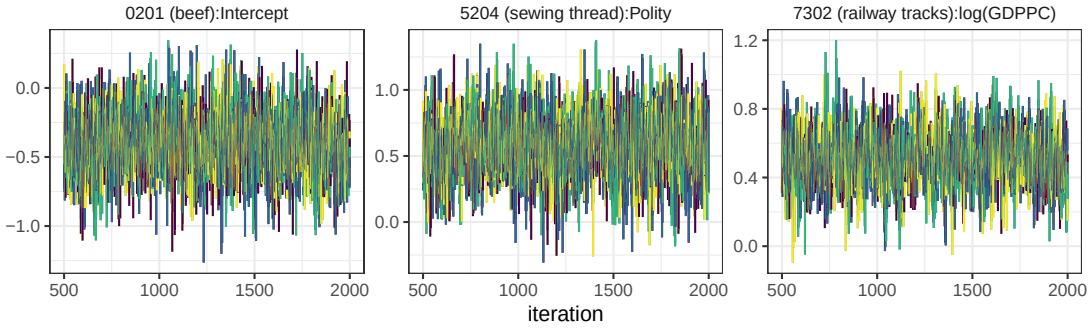


(b) HS 4-digit level

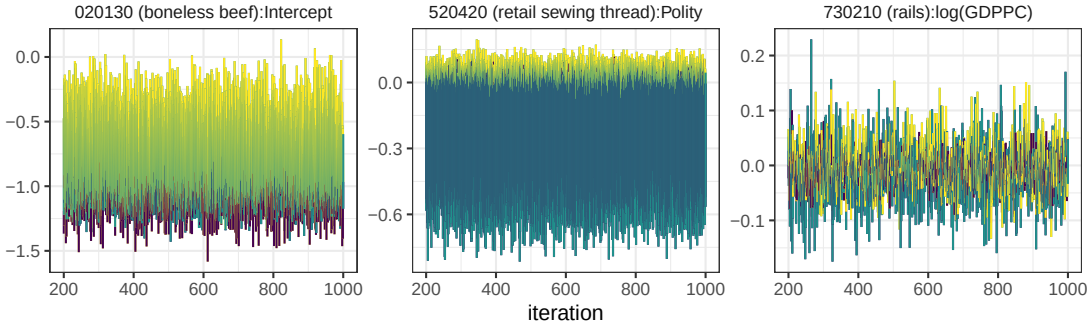
Figure S2: **Effect of Democracy on Log Tariffs, Variational Bayes Results.** This plot presents posterior means and 95% credible intervals for the estimated effects of democracy on tariff rates for all HS2 chapters and HS4 headings using Variational Bayes (VB) rather than Hamiltonian Monte Carlo (HMC). The advantage of VB over HMC is a significant gain in computational speed which facilitates easier replicability: VB takes approximately 20 minutes to converge for both the HS2 and HS4 monadic models, while HMC takes 1 day and approximately 3 weeks for the HS2 and HS4 monadic models respectively. The disadvantage is that there no exact convergence guarantees. A comparison with Figures 2 and 3 shows that our substantive findings do not significantly change, however the magnitude of effect sizes does.



(a) HS 2-digit (HMC)



(b) HS 4-digit (HMC)



(c) HS 6-digit (VB)

Figure S3: **Effect of Democracy on Log Tariffs, Model Traceplots.** Panels show the four Markov chain traces of all three product-specific coefficients estimated for a set of representative products p (γ_p in equation 1). Panel (a) corresponds to a subset of model results in Figure 2, panel (b) corresponds to Figure 3, and panel (c) corresponds to Figures S1 and S1. Thus, each row shows the same product-specific coefficient at varying levels of Harmonized System classification.

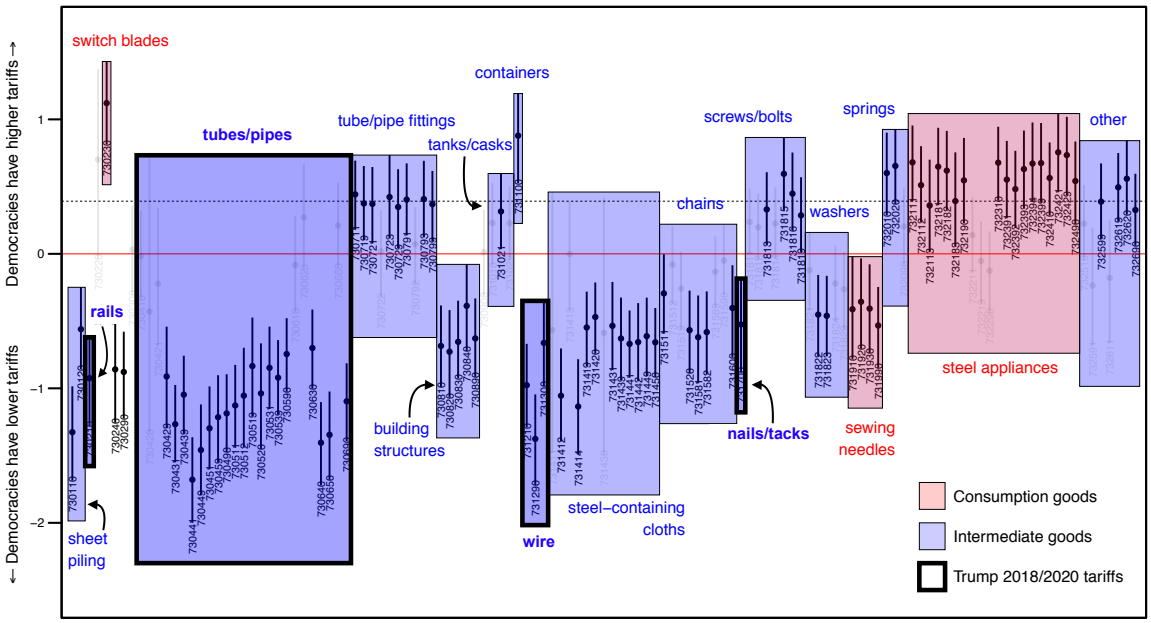


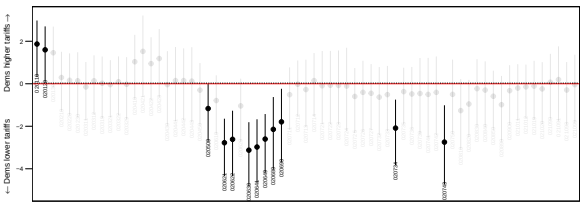
Figure S1: **Effect of Democracy on HS6 Log Tariffs, Steel Products.** This plot presents posterior means and 95% credible intervals for the estimated effect of democracy on tariff rates for HS6 goods classified as Steel products (HS2 chapter 73). Boxes indicate distinct product categories colored by Broad Economy Category (BEC). Boxes with thick black outlines indicate steel products targeted for protection in the United States by the Trump administration in 2018 and 2020. Across all products in this industry, MFN tariffs are about $40\%(\approx \exp(0.34) - 1)$ higher on average for democracies than non-democracies (the dotted horizontal line).

S4 Additional Harmonized System 6-digit Analysis

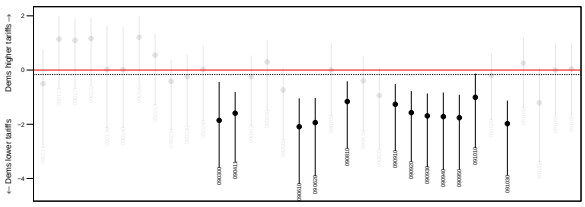
Figure S1 illustrates the main finding of the paper in the context of the steel industry. The negative effects of democracy are concentrated on intermediate goods (shaded in blue), whereas there exists statistical difference between the two regime types in trade policies over consumption goods such as steel appliances (shaded in red). Interestingly, we find that the set of steel products on which the Trump administration imposed high tariffs (boxes with bold boundaries) are tubes, pipes, and wires, which tend to otherwise have low tariffs in democracies.

Our findings underscore the fact that consumers incur dispersed costs of protection in contrast to concentrated benefits that import-competing producers may enjoy. Furthermore, our findings raise an important question for IPE scholarship as to why consumer interests do not get translated into trade policy-making. More generally, the results presented in this section call into question the validity of the key assumptions made in the literature when scholars study the channels through which political institutions affect trade policy-making. That is, regime security, party discipline, size of constituencies, and median voter's preferences may all interact differently with political

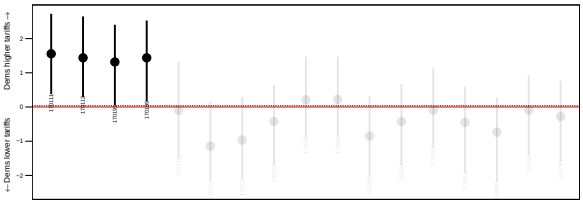
institutions at the product-level. Taken together, the significant variability across products suggest that the current empirical understanding of how democratic regime type interacts with the preferences of actors in the economy is incomplete at best.



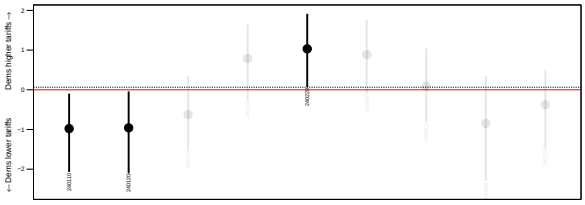
(a) Meat products (HS2: 02)



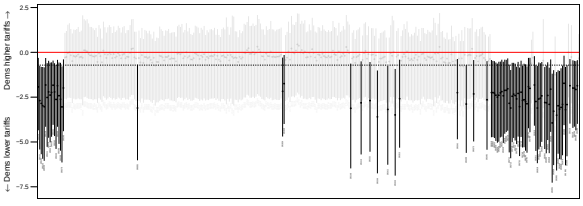
(b) Coffee/tea products (HS2: 09)



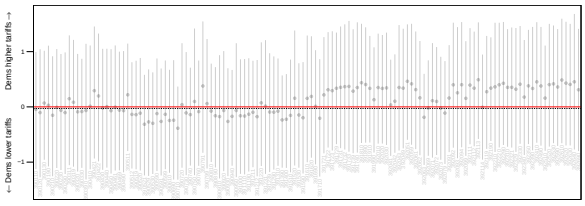
(c) Sugar products (HS2: 17)



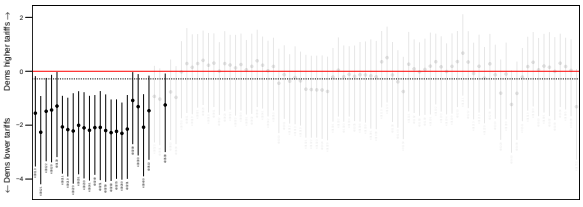
(d) Tobacco products (HS2: 24)



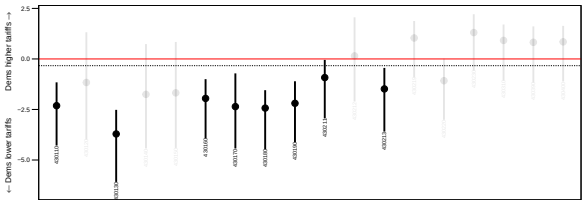
(e) Organic chemical products (HS2: 29)



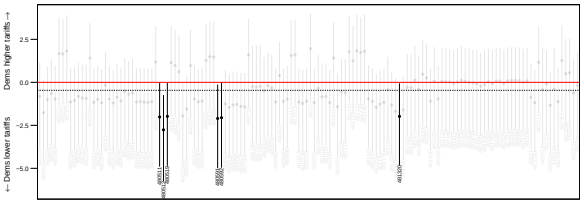
(f) Plastic products (HS2: 39)



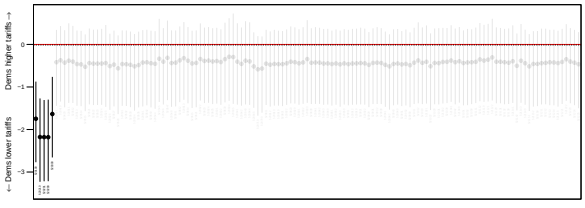
(g) Rubber products (HS2: 40)



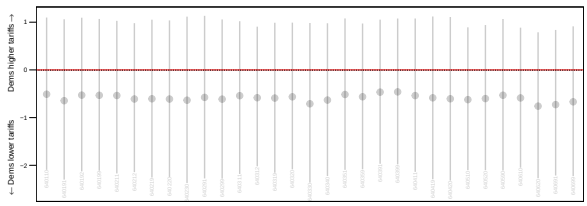
(h) Furskin products (HS2: 43)



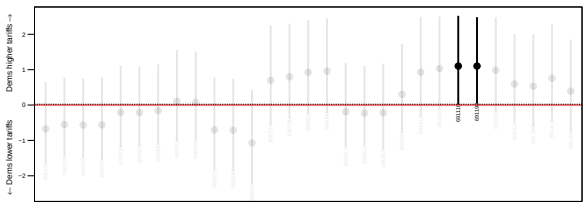
(i) Paper products (HS2: 48)



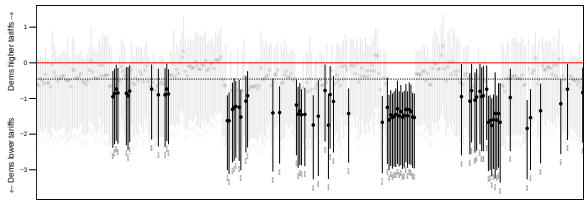
(j) Cotton products (HS2: 52)



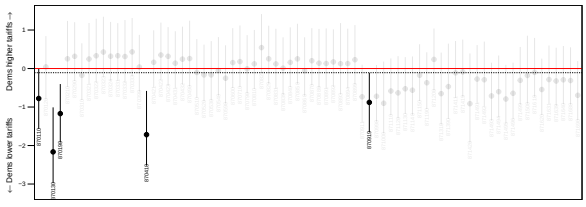
(k) Footwear products (HS2: 64)



(l) Ceramic products (HS2: 69)



(m) Electrical machinery products (HS2: 85)



(n) Vehicle products (HS2: 87)

Figure S1: **Effect of Democracy on HS6 Log Tariffs, Controlling for NTBs.** This plot presents posterior means and 95% credible intervals for the estimated effect of democracy on tariff rates for HS6 products in a representative set of HS2 industries across various Harmonized System Sections. The replication material includes all the estimates as well as their posterior samples for each HS6 product.

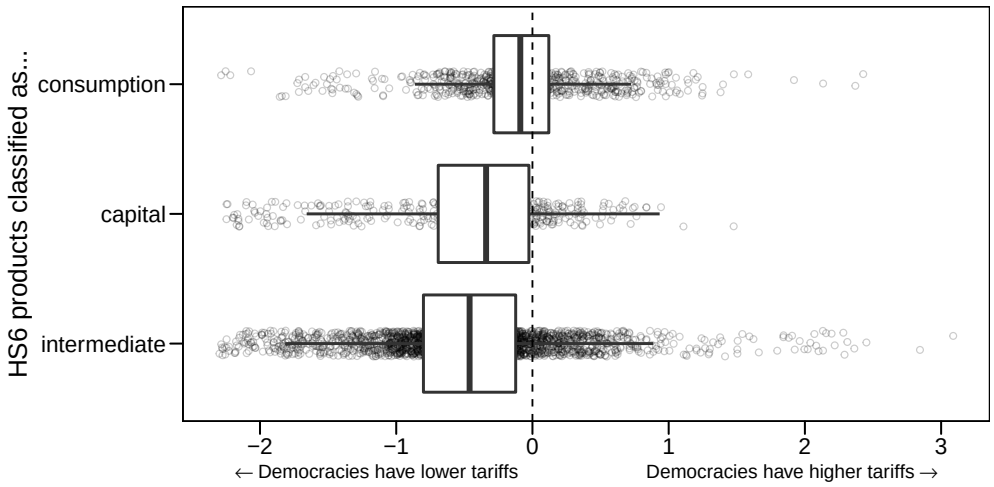
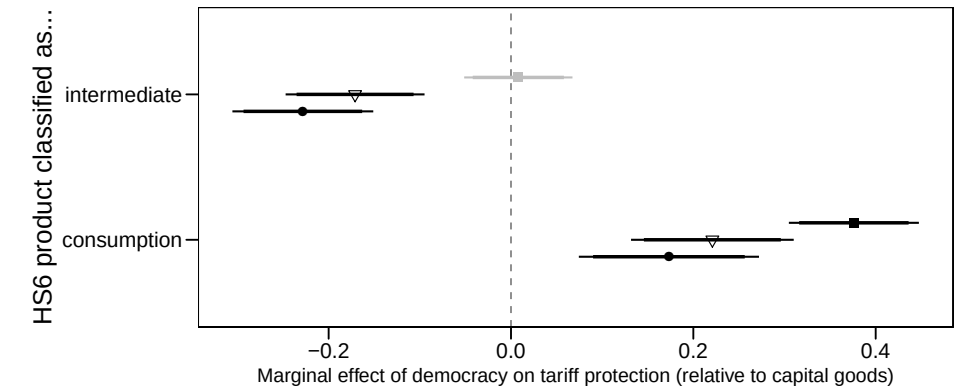
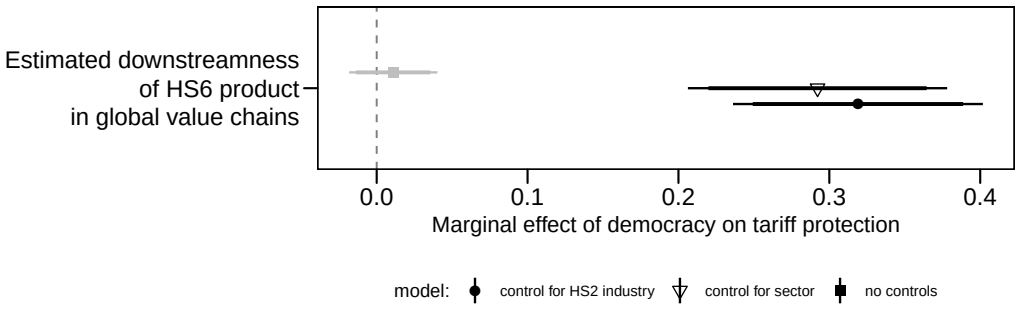


Figure S2: **Effect of Democracy on HS6 Log Tariffs, Products Grouped by BEC.** This plot describes the posterior means of estimated effects of democracy on trade policy for all HS6 products across all HS2 industries (a more complete set than Figure S1) where each HS6 product is categorized into its Broad Economic Category (BEC). Approximately 16% or 946 out of 4,896 HS6 products are missing BEC categorizations.

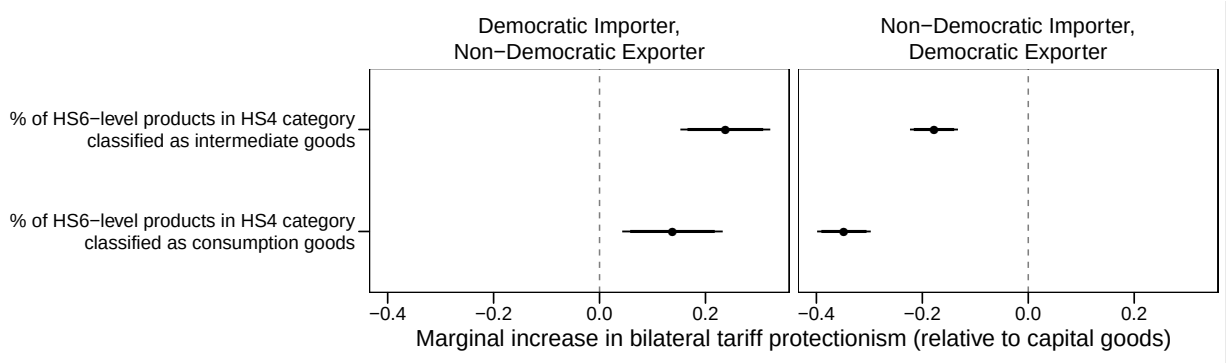


(a)

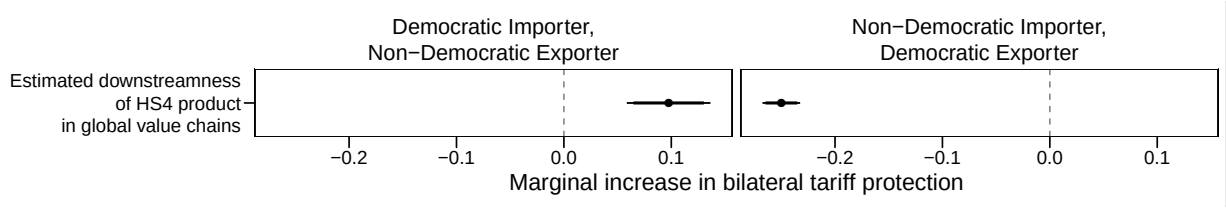


(b)

Figure S3: **HS 6-level Predictors of Democratic Protection.** We regress the HS 6-level posterior mean estimates of the monadic parameter γ_p^{DEM} shown in Figure S2 (where p is an HS 6-level index) on HS 6-level product characteristics including (a) its BEC classification as either capital, intermediate, or consumption and (b) a continuous measure of its "downstreamness" in global value chains across all countries between 1995 and 2011 as estimated by Antras and Chor (2018). For both measures, we estimate a univariate linear regression model, a linear regression adjusting for the HS2 industry classification, and a regression model adjusting for the sector. These controlled models are necessary since the HS 6-level monadic estimates are fit separately at the industry level for computational purposes.



(a)



(b)

Figure S4: **HS 4-level Predictors of Democratic Protectionism in Bilateral FTAs.** We regress the HS4-level posterior mean estimates of the dyadic parameter γ_p^d for $d \in \{\texttt{DEM/NONDEM}, \texttt{NONDEM/DEM}\}$ shown in Figure S2 (where p is an HS4-level index) on HS4-level product characteristics including (a) the proportion of its' HS6 tariff-lines classified as either capital, intermediate, or consumption and (b) the average of its' HS6 tariff-lines "downstreamness" in global value chains across for all countries between 1995 and 2011 as estimated by Antras and Chor (2018).

S5 Additional Empirical Application: Dyadic Analysis

Do the regime types of trading partners affect the depth of trade liberalization that occurs? We make three contributions to the analysis of this question. First, we directly analyze trade *policies* between country-pairs rather than using a proxy measure such as trade volume. Note that trade policies are directly related not only with regime types but also with trade volume.[5] Thus, using trade volume as a proxy dependent variable may introduce an endogeneity bias when researchers estimate the effect of political institutions on trade policies because the omitted actual trade policy variable may confound the effect. By using applied tariffs as the dependent variable, therefore, our analysis addresses the potential endogeneity bias and returns more accurate quantitative estimates of the relationship between regime types and the choice of trade policy than analysis conducted using trade volumes.

Second, we distinguish the *direction* of trade policy between two countries: what regime type is the importer and what regime type is the exporter? A direct test of the hypothesis that pairs of democracies are more likely to engage in liberalization requires researchers to examine two questions: (1) whether a democratic importer is more likely to liberalize when its export partner is a democracy rather than a non- democracy, and (2) whether a democratic exporter can achieve freer market access when its negotiating import partner is a democracy instead of a non-democracy. Finally, we estimate heterogeneous effects of political interactions on trade liberalization across industries. The findings from the monadic analysis confirm that unilateral incentives to liberalize are affected by the structure of political institutions as well as by political pressures that vary across interest groups. Consequently, we expect that bilateral trade negotiations will also be affected by trading partners' industry-specific political constraints. The bilateral tariff data that we introduced in Section 2 enables us to examine the complexity of preferential trade policy outcomes across industries.

We emphasize that the set up of our study presented in this section departs significantly from previous studies (e.g. Mansfield et al., 2000) as we focus our analysis on a much smaller set of country pairs with bilateral trade agreements. In this regard, the goal of this section is to leverage the novel identification strategy to go beyond correlational analyses, and to utilize the massive

[5] In fact, the standard gravity model of trade predicts that bilateral trade volume depends directly on the costs of trade, which includes tariffs and non-tariffs barriers to market access between the trading partners.

amounts of granular data to precisely estimate the interactive effects of political institutions on the depth of trade liberalization in preferential trade agreement negotiations.

S5.1 Methodology

We employ a difference-in-differences identification strategy. Specifically, we examine the industry-specific interactive effects of regime type on the degree of trade liberalization that occurred following bilateral Free Trade Agreements (FTAs). We compare the magnitudes of tariff reductions before and after FTAs of dyads with different regime types.

Our proposed hierarchical linear model for the change in trade policy before and after an FTA between importer i and exporter j is given by

$$\begin{aligned}\Delta\tau_{ijpt} = \alpha &+ (\beta^{\texttt{DEM/NONDEM}} + \gamma_p^{\texttt{DEM/NONDEM}}) D_{ijt}^{\texttt{DEM/NONDEM}} + (\beta^{\texttt{NONDEM/DEM}} + \gamma_p^{\texttt{NONDEM/DEM}}) D_{ijt}^{\texttt{NONDEM/DEM}} \\ &+ (\beta^{\texttt{NONDEM/NONDEM}} + \gamma_p^{\texttt{NONDEM/NONDEM}}) D_{ijt}^{\texttt{NONDEM/NONDEM}} + \delta_0^\top \mathbf{Z}_{it} + \delta_1^\top \mathbf{Z}_{jt} + \delta_2^\top \mathbf{Z}_{ijt} + \delta_3^\top \mathbf{Z}_{ipt} \\ &+ \lambda M_{ipt} + \xi_p + \epsilon_{ijpt}, \qquad \text{(S1)}\end{aligned}$$

where p indexes products at the chosen level of disaggregation. The proposed model in equation (S1) distinguishes the direction of trade liberalization: $D_{ijt}^{\texttt{DEM/NONDEM}}$ is an indicator equal to 1 if the Polity IV score for importer i is 6 or above and the score for exporting partner j is below 6; $D_{ijt}^{\texttt{NONDEM/DEM}}$ and $D_{ijt}^{\texttt{NONDEM/NONDEM}}$ are defined similarly.

For an FTA between i and j that goes into effect in year t^*, we compare the degree of tariff reduction between $t^* - L$ and $t^* + F$ where L and F denote the length of lags and leads, respectively. This accounts for the possibility of anticipation effects as well as phase-in periods that are prevalent in trade agreements. To minimize excessive extrapolation into the future, we focus on the comparison of tariff rates immediately before and after each trade agreement by setting $L = F = 1$.[6] To simplify the notation, we denote the year prior to the FTA taking effect by t, i.e., $t = t^* - L$. Then $\Delta\tau_{ijpt}$ represents the change in tariffs (logged) for product p between year $t^* - L$ and $t^* + F$. $\mathbf{Z}_{it}$ and $\mathbf{Z}_{jt}$ represent covariates for the importer and exporter, including their log population and log GDP in year t. $\mathbf{Z}_{ijt}$ represents dyad-level covariates, including logged total trade volume between the two countries, log of the partner-specific mean tariff imposed by the importer across all industries, whether at least one of the pair is a major power, whether both

[6] To account for more extensive phase-in periods as well as anticipation effects in trade agreements, we also check the robustness of our findings by setting $L = F = 3$. We find that the direction of bilateral trade liberalization is significant in this analysis as well.

parties were GATT/WTO members, as well as logged distance (in kilometers) between the two countries. $\mathbf{Z}_{ipt}$ provides a binary indicator for non-tariff barriers by i on product p in year t. To account for the fact that democracies might have lower overall tariff rates to begin with, we control for pre-existing tariff levels by including the pre-FTA MFN rates M_{ipt} for each product p. Finally, ξ_p is a product-specific intercept. As in the monadic analysis, we model the prior distribution of the product-varying coefficient $\gamma_p = \left[\xi_p, \gamma_p^{\text{DEM/NONDEM}}, \gamma_p^{\text{NONDEM/DEM}}, \gamma_p^{\text{NONDEM/NONDEM}} \right]$ to be Normally distributed: $\gamma_p \sim \mathcal{N}(\phi_{k[p]}, \Sigma_\gamma)$ and $\phi_k \sim \mathcal{N}(\mathbf{0}, \Sigma_\phi)$.

The quantities of interest are the differences in the degree of trade liberalization between democratic pairs (i.e., dyads in which both parties are democracies) and mixed dyads (i.e., one party is a democracy and the other is not):

$$\mathbb{E}[\Delta\tau_{ijpt} \mid D_{ijt}^{\text{DEM/NONDEM}}] - \mathbb{E}[\Delta\tau_{ijpt} \mid D_{ijt}^{\text{DEM/DEM}}] = \beta^{\text{DEM/NONDEM}} + \gamma_p^{\text{DEM/NONDEM}} \quad \text{(S2)}$$

$$\mathbb{E}[\Delta\tau_{ijpt} \mid D_{ijt}^{\text{NONDEM/DEM}}] - \mathbb{E}[\Delta\tau_{ijpt} \mid D_{ijt}^{\text{DEM/DEM}}] = \beta^{\text{NONDEM/DEM}} + \gamma_p^{\text{NONDEM/DEM}} \quad \text{(S3)}$$

where equation (S2) compares a dyad with two democracies to a mixed dyad where the *importer* is a democracy and the export partner is not, and equation (S3) compares a dyad with two democracies to a mixed dyad where the *exporter* is a democracy and the import partner is not. We estimate equation (S1) at HS2 and HS4 levels with Stan, using a variational approximation method to efficiently fit the HS4-level model.[7]

S5.2 Empirical Results

We obtain data on preferential trade agreements from the WTO's Regional Trade Agreements Information System database. To make the analysis conceptually clean, we focus on bilateral FTAs in which there are only two parties to the agreement and in which both parties are sovereign states. We therefore include agreements such as the USA-Australia FTA but exclude the North American Free Trade Agreement, the EU-Canada FTA, and the FTA between the members of the European Free Trade Association and the Southern African Customs Union, for example. Our dataset consists of 90 unique bilateral FTAs, provided in in Appendix S5.3.[8]. Of these, 44 are signed between democratic dyads, 38 are mixed dyads, and 8 are non-democratic dyads. There are 36 unique parties to these 90 FTAs, of which 26 are democracies and 10 are non-democracies.

[7] We perform various diagnostics to check the convergence. See Appendix S3 for a representative set of traceplots.

[8] As Table S5.1 shows, 19 of the bilateral FTAs are fairly recent, taking effect on or after 2010. Importers sometimes revise the data they previously reported to the WTO and UNCTAD, including revisions to tariff schedules. We periodically check the underlying databases for changes, and will update our analysis as the data are refreshed.

Our emphasis on bilateral FTAs arises from our interest in understanding how democratic institutions relate to the outcomes of trade negotiations. Certainly, countries that enter into trade negotiations are not a random sample from the population of all possible dyads, and therefore we emphasize that our estimand is *not* the difference in tariff reductions between the population of democratic pairs and mixed pairs in general. Rather, we are interested in differences in tariff reductions between dyad types among those dyads that successfully negotiate bilateral FTAs. This interest in the "intensive margin" of negotiated outcomes is the same premise that motivates the formal model developed by Mansfield et al. (2000).

In order to make a direct comparison between our analysis and prior research, we estimate an undirected version of equation (S1) of the form

$$\begin{aligned}\Delta\tau_{ijpt} = \alpha &+ (\beta^{\texttt{MIXED}} + \gamma_p^{\texttt{MIXED}}) D_{ijt}^{\texttt{MIXED}} + (\beta^{\texttt{NONDEM/NONDEM}} + \gamma_p^{\texttt{NONDEM/NONDEM}}) D_{ijt}^{\texttt{NONDEM/NONDEM}} \\ &+ \delta_0^\top \mathbf{Z}_{it} + \delta_1^\top \mathbf{Z}_{jt} + \delta_2^\top \mathbf{Z}_{ijt} + \lambda M_{ipt} + \xi_p + \epsilon_{ijpt}, \end{aligned} \tag{S4}$$

which produces a comparable quantity of interest $\mathbb{E}[\Delta\tau_{ijpt} \mid D_{ijt}^{\texttt{MIXED}}] - \mathbb{E}[\Delta\tau_{ijpt} \mid D_{ijt}^{\texttt{DEM/DEM}}] = \beta^{\texttt{MIXED}} + \gamma_p^{\texttt{MIXED}}$, which is the tariff reduction for product p by mixed dyads compared to tariff reduction by democratic dyads *without* distinguishing the direction of trade liberalization. The left panel in Figure S1 presents our estimates for the main effect $\beta^{\texttt{MIXED}}$ using HS2 and HS4 level data. Consistent with previous studies, we find that mixed dyads tend to give shower tariff reductions to each other than democratic dyads when they sign an FTA, although the difference is not statistically significant at the HS4 level, suggesting potential aggregation bias.[9]

To better understand this finding, we decompose the *direction* of trade liberalization among FTA partners. The right two panels in Figure S1 ("Directed") report the posterior mean and 95% credible intervals of the main effects $\beta^{\texttt{DEM/NONDEM}}$ and $\beta^{\texttt{NONDEM/DEM}}$ given in equations (S2) and (S3) using the HS2 and HS4 levels data. First, we examine whether democratic importers engage in deeper trade liberalization when their export partner is a democracy or a non-democracy. This corresponds to the estimates in the center panel ("Democratic Importer, Non-Democratic Exporter"). We find that, in fact, democratic importers tend to engage in deeper tariff reductions when their export partner is a non-democracy rather than a democracy when we analyze the data at the HS4 level. Second, we consider whether democratic exporters achieve better market access when their import

[9] Our model also allows us to compare pairs of non-democracies to pairs of democracies. We find that the former engages in deeper liberalization than the latter (-0.34 log points), although this estimate is likely to be noisy given the small number of FTAs involving non-democratic pairs in our data.

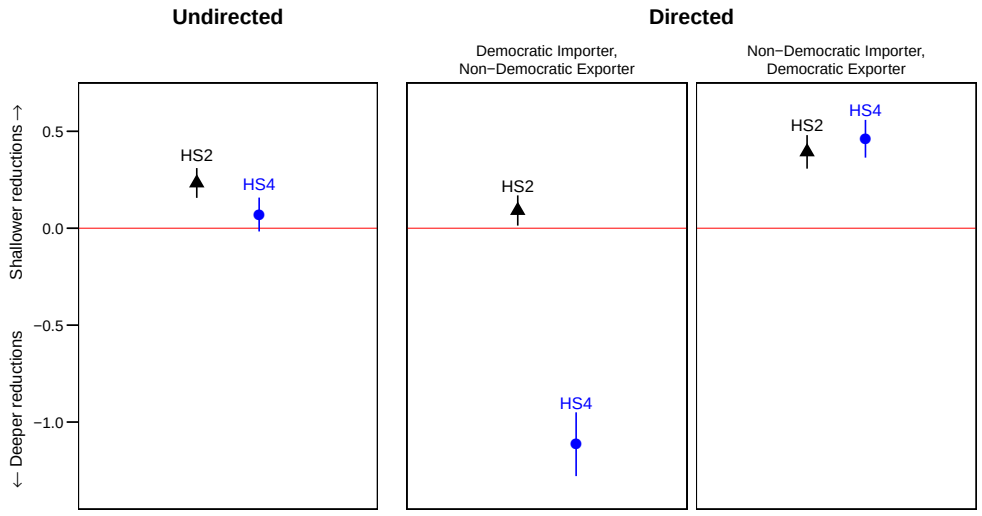
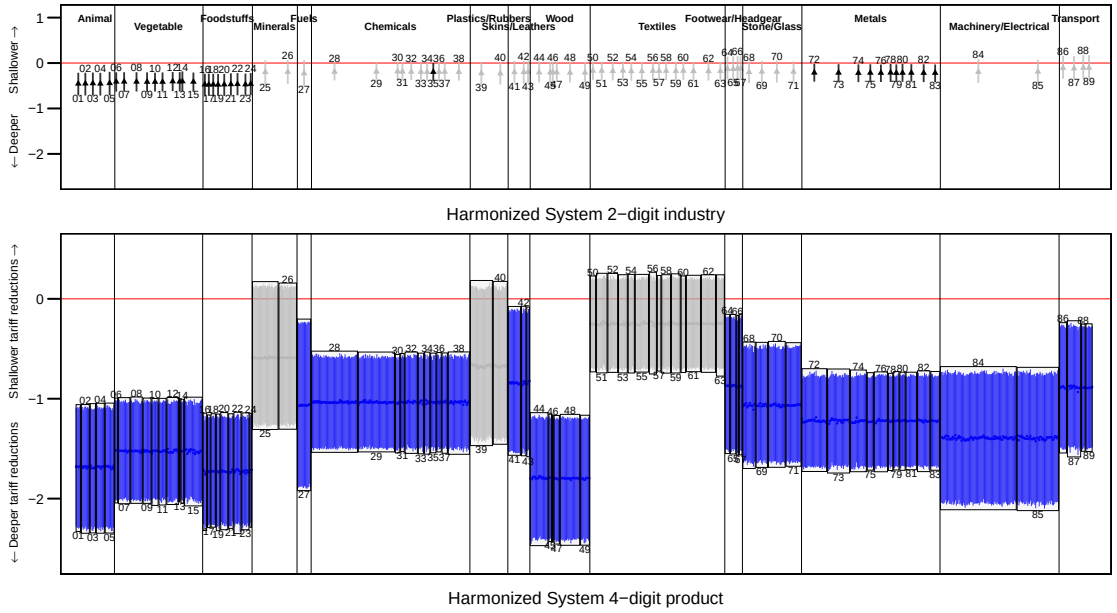


Figure S1: **Tariff Reductions by Dyad Type.** The left-most panel shows the difference in tariff reductions between mixed dyads (where one party to the FTA is a democracy and the other is a non-democracy) and democratic dyads. The right two panels disaggregate mixed dyads into two types: one in which the importer is the democracy and one in which the exporter is the democracy. Black triangles indicate tariff reductions using HS2-level, and blue dots indicate tariff reductions using HS4-level tariff and volume measures (with 95% credible interval). The comparison is with a democratic dyad. The estimates suggest that the finding that mixed dyads achieve shallower tariff reductions than democratic dyads (far left panel) might be due to the fact that non-democratic importers give shallower concessions to democratic exporters than democratic importers give to democratic exporters (far right panel).

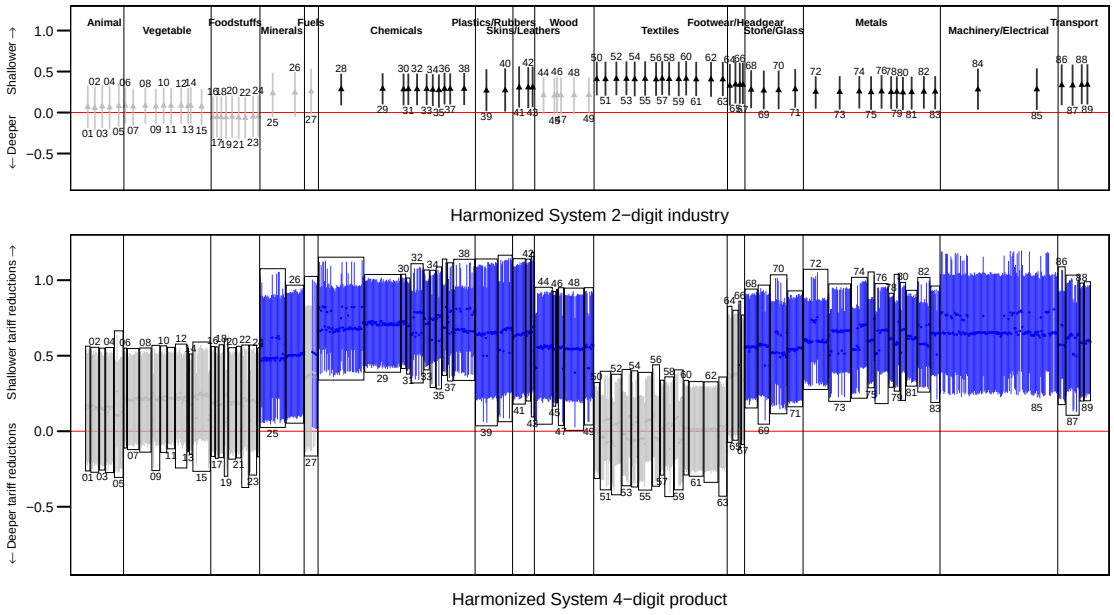
partner is a democracy or a non-democracy. As shown in the right-most panel ("Non-Democratic Importer, Democratic Exporter"), we find that tariff reductions are smaller when non-democratic importers partner with democratic exporters than when democratic importers partner with democratic exporters. The magnitude of the difference is larger with more granular tariff data at the HS4 level.

Finally, we explore the complex bilateral strategic incentives among FTA partners at a granular level. Figure S2 presents our estimates of the industry-varying effects: $\beta^{\texttt{DEM/NONDEM}} + \gamma_p^{\texttt{DEM/NONDEM}}$ in panel (a) and $\beta^{\texttt{NONDEM/DEM}} + \gamma_p^{\texttt{NONDEM/DEM}}$ in panel (b). Consistent with Figure S1, panel (a) of Figure S2 shows that mixed pairs with a democratic importer engage in *deeper* tariff reductions than pairs of democracies. At the HS2 level, the estimated effects are significant for the agriculture and metals industries, while other industries exhibit small but similar changes. This pattern is more prominent at the HS4-level, where most estimates are negative and statistically significant. Panel (b) at the bottom shows that mixed pairs with a non-democratic importer engage in *shallower* tariff reductions than pairs of democracies. Again, our findings are consistent across HS2 and HS4 industries.

Differentiating capital, intermediate, and capital goods echoes the monadic finding: democ-



(a) Democratic Importer, Non-Democratic Exporter



(b) Non-Democratic Importer, Democratic Exporter

Figure S2: **Mixed Dyads Compared to Democratic Dyads.** Panel (a) shows that a democratic importer tends to give deeper tariff reductions to their non-democratic partners than they do to their democratic partners. We find significant effects in the agriculture and metals industries at the HS2 level, while most estimates achieve statistical significance at the HS4 level. Conversely, Panel (b) shows that a non-democratic importer tends to give shallower tariff reductions to a democratic export partner than a democratic importer gives to a democratic export partner.

racies engage in shallower cuts (deeper protectionism) of consumption and intermediate goods relative to capital goods, while non-democracies privilege capital goods. The same result holds

when using the GVC-based measure of downstreamness.[10]

Importantly, unlike our monadic analysis, we do not find significant heterogeneities when we disaggregate the analysis at the HS4 level. Rather, we find that the point estimates are relatively constant across HS4 goods belonging to the same sector (divided by solid vertical lines). This suggests that in bilateral FTAs, reciprocal concessions are made reflecting broad industry-level interests rather than highly heterogeneous interest of individual producers.[11] credible commitment mechanism among democracies from our dyadic analysis.

S5.3 List of Bilateral FTAs

Table S5.1: List of Bilateral Free Trade Agreements

Panel A: Non-Democratic Pairs		
Armenia	Ukraine	1994
Azerbaijan	Ukraine	1994
Ukraine	Uzbekistan	1994
Jordan	Singapore	2003
Morocco	Turkey	2004
Egypt	Turkey	2005
China	Singapore	2007
Jordan	Turkey	2009
Panel B: Mixed Pairs		
Georgia	Ukraine	1994
Israel	Turkey	1995
Georgia	Turkmenistan	1998
Macedonia	Turkey	1998
Jordan	United States	1999
New Zealand	Singapore	1999
Japan	Singapore	2000
Australia	Singapore	2001
Singapore	United States	2002
Australia	Thailand	2003
Moldova	Ukraine	2003

Table S5.1: Continued on next page

[10] See Figure S4 for coefficient estimates.

[11] The author's interview with a Korean diplomat who participated in the KORUS negotiation (FTA between South Korea and the United States) confirms that this was the case in the agreement. Upon the announcement of the negotiation, the Korean government formed several task forces organized around broad industry groupings within relevant agencies such as the Ministry of Agriculture, the Ministry of Trade, Industry and Energy, and Ministry of Health and Welfare.

Table S5.1 – *Continued from previous page*

New Zealand	Thailand	2003
Tunisia	Turkey	2003
Bahrain	United States	2004
Chile	China	2004
Japan	Malaysia	2004
South Korea	Singapore	2004
Morocco	United States	2004
Panama	Singapore	2004
China	Pakistan	2005
Japan	Thailand	2005
Albania	Turkey	2006
China	New Zealand	2006
Georgia	Turkey	2006
Malaysia	Pakistan	2006
Peru	Singapore	2007
Oman	United States	2007
China	Peru	2008
Montenegro	Turkey	2008
China	Costa Rica	2009
Canada	Jordan	2010
Chile	Malaysia	2010
Australia	Malaysia	2011
Costa Rica	Singapore	2011
South Korea	Turkey	2011
Montenegro	Ukraine	2011
Mauritius	Turkey	2011
Switzerland	China	2012

Panel C: Democratic Pairs

Colombia	Mexico	1993
Canada	Chile	1995
Canada	Israel	1995
Chile	Mexico	1997
Israel	Mexico	1998
Canada	Costa Rica	2000
Chile	Costa Rica	2000
Chile	El Salvador	2000
Panama	El Salvador	2001
Chile	South Korea	2002
Mexico	Uruguay	2002
Chile	United States	2002
Australia	United States	2003
Japan	Mexico	2003

Table S5.1: Continued on next page

Table S5.1 – *Continued from previous page*

Sri Lanka	Pakistan	2003
Chile	Japan	2005
Mauritius	Pakistan	2005
Costa Rica	Panama	2006
Indonesia	Japan	2006
Japan	Philippines	2006
Chile	Panama	2006
Australia	Chile	2007
Canada	Peru	2007
Switzerland	Japan	2007
Chile	Colombia	2007
Guatemala	Panama	2007
Honduras	Panama	2007
Nicaragua	Panama	2007
Chile	Peru	2007
Peru	United States	2007
Chile	Guatemala	2008
Canada	Colombia	2009
South Korea	Peru	2009
Colombia	United States	2010
Japan	Peru	2010
South Korea	United States	2010
Mexico	Peru	2010
Chile	Nicaragua	2010
Panama	Peru	2010
Panama	United States	2010
Canada	Panama	2011
Costa Rica	Peru	2011
Canada	Honduras	2012
Australia	South Korea	2012

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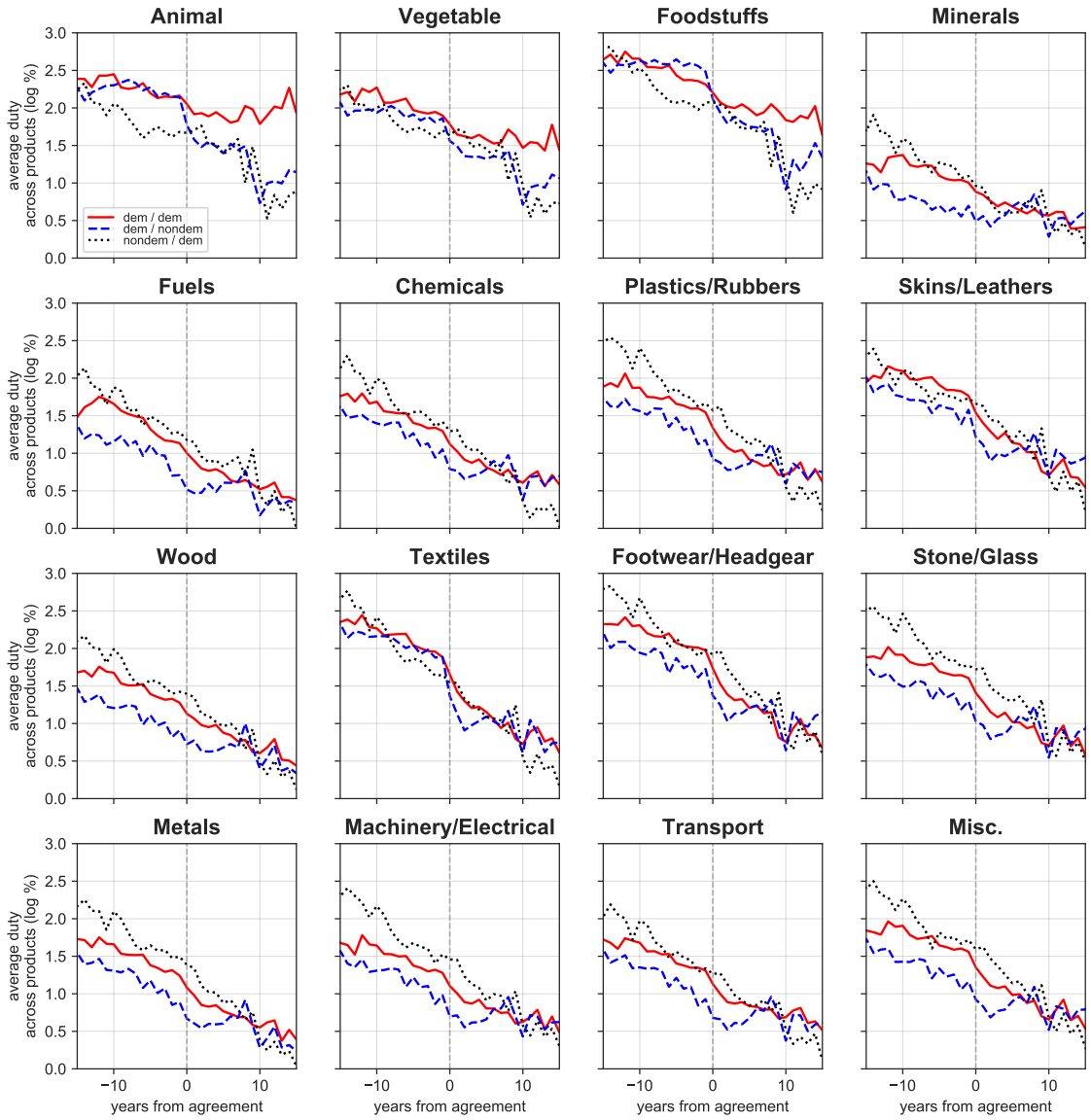

Figure S3: **Tariff Reduction Trajectories by Industry and Dyad Type.** This plot shows the average logged HS 4-digit level tariffs between FTA partners over time across different industries (HS 2-digit) and dyad type. For instance, the solid red line indicates average industry-specific tariffs before and after an FTA when both FTA partners are democracies, while the blue dashed line summarizes agreements where the importer is a democracy and the exporter is a non-democracy. Due to the relative sparsity of free trade agreements between non-democracy pairs, we exclude them from the set of dyads in this figure.

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