Reversing Protectionism: A First Look at Product-level Trade Data from Smoot-Hawley to the GATT*

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November 21, 2024

Abstract

This paper studies U.S. trade policy from the Smoot-Hawley Tariffs through the 1947 General Agreement on Tariffs and Trade. Given the recent return to broad-based import protection policies, it is more important than ever that we understand the historical dynamics behind the U.S.'s largest trade liberalization in the last century. Our novel dataset of product-level tariff commitments and imports enables the first detailed empirical study of this dynamic period in trade policy, providing new stylized facts about U.S. tariffs and empirical evidence that changes in these tariffs are consistent with predictions from the terms-of-trade theory.

*The views expressed in this paper are strictly those of the authors and do not represent the opinions of the U.S. International Trade Commission or any of its Commissioners. This paper was previously circulated under the titles "Quantifying U.S. GATT Trade Liberalization" and "Quantifying and Motivating U.S. Trade Liberalization 1930–1947."

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1 Introduction

An important topic in international economics is understanding what motivates countries to liberalize their trade policy, and in particular, to form trade agreements.[1] Given the recent return to broad-based import protection policies in the U.S. and elsewhere—to levels not seen since the mid-twentieth century—it is more important than ever that we understand the historical dynamics behind the U.S. trade liberalization during the transition from the previous peak in U.S. tariffs with Smoot-Hawley tariffs in 1930 to the beginning of the GATT in 1947. This paper provides the data to make this possible. It then uses that data to provide an empirical test of the terms-of-trade theory for a developed country that is large in terms of its importer market power.

The terms-of-trade theory posits that, when countries possess importer market power, they have a temptation to set higher import tariffs to shift the cost of protecting domestic industries onto their trading partners. Acting on this importer market power results in unilateral tariffs that are generally higher than the level that optimizes the country's welfare. When countries have importer market power, trade agreements lead to lower, more efficient tariff levels. While the theoretical literature has received much attention dating back to at least Johnson (1953), there is less research providing empirical evidence of the terms-of-trade theory.[2]

One reason empirical evidence is limited is that the terms-of-trade theory applies to countries moving from a non-cooperative to a cooperative trade policy setting. With the GATT/WTO spanning multiple decades and the proliferation of preferential trade agreements, observing a non-cooperative setting is particularly challenging for the case of a large, developed economy. This is because comprehensive, product-level panel data for tariffs and imports has not been available for the time period preceding the GATT. For example, Bown and Irwin (2017) document the available data covering the GATT rounds and find it to be frustratingly sparse.[3] Broda, Limao, and Weinstein (2008) and Bagwell and Staiger (2011) use non-WTO members to proxy for non-cooperative tariffs; however, this yields samples that are

[1] See Maggi (2014) for a detailed overview of the motives for trade agreements.

[2] For the empirical literature, see Broda, Limao, and Weinstein (2008); Bagwell and Staiger (2011); Bown and Crowley (2013); Ludema and Mayda (2013); Bown and Tovar (2016); Blanchard, Bown, and Johnson (2016); Irwin and Soderbery (2021); and Jestrab (2024).

[3] More recently, Bagwell, Staiger, and Yurukoglu (2020) digitize the bilateral negotiation records for the Torquay Round. Greenland, Lake, and Lopresti (2023) use product-level data for the Tokyo Round. Acosta and Cox (2024) compile portions of U.S. tariff commitments from the 1930s through the modern Harmonized Tariff Schedule, focusing on the ad valorem component of tariff rates as the authors note, "we have not consistently digitized unit values going back to 1930" (pg. 20). See Section 4.1 below for a discussion of the importance of specific tariffs during this time period.

predominantly small and developing economies. These samples are not ideal for testing the terms-of-trade theory since developing economies usually hold less importer market power than large, developed economies.

This paper makes two main contributions: it overcomes the challenge of historical data availability and provides evidence that U.S. tariff changes between 1930 and the first GATT round in 1947 are consistent with predictions from the terms-of-trade theory. With respect to data collection, we have located, digitized, and concorded the U.S. tariff schedules that include the universe of potentially-imported products from the Smoot-Hawley Tariff Act in 1930 to the first GATT round in 1947. This data provides detailed time series information for each product's tariff over time, which encompasses commitments in bilateral agreements and the GATT as well as unilateral actions outside of trade agreement negotiations. To this tariff commitment data, we add detailed U.S. import data for select years and build concordances that allow us to track the tariff level and import values and quantities at the 7-digit Schedule A product level from 1930–1947.[4]

This new panel data set allows us to provide summary statistics for U.S. tariffs over 1930–1947 and document stylized facts about U.S. trade policy during this period. We can separately analyze specific (i.e., per quantity) tariffs and ad valorem (as a percentage of value) tariffs. However, we focus on analyses combining all tariff types—including more complex forms—using ad valorem equivalents (AVEs). We provide evidence that ignoring specific tariffs or other tariffs with specific components (i.e., compound and mixed tariffs) is not advisable during this period, as only about 38 percent of products have positive ad valorem tariffs.[5] Importantly, considering only the ad valorem component of more complex tariff forms—which comprise nearly 20 percent of the data—introduces non-random mismeasurement.

We confirm that U.S. tariffs decreased significantly for many products between Smoot-Hawley and the first GATT round. What may be surprising to many is that we find that the bilateral trade agreements flowing out of the 1934 Reciprocal Trade Agreements Act (RTAA) made an outsized contribution to the U.S. trade liberalization achieved between 1930 and 1947. The U.S. was active in negotiating these bilateral trade agreements prior to the GATT, and concessions from these bilateral agreements were extended on a most-favored-nation (MFN) basis. That is, any tariff concession the U.S. made in any bilateral

[4]We use the most disaggregated product level that is available in the historical records: the Schedule A number, of which there are about 5,500 products. This is similar to the 7-digit TSUS level and approximately the HS-6 digit level. This paper refers to a Schedule A number as a product or item.

[5]About 16 percent of products are duty-free and could be characterized as having an ad valorem tariff of zero. We discuss duty-free products in more detail in Appendix 8.3.1.

agreement (except the one with Cuba) was automatically extended to all other countries, regardless of whether they had a bilateral agreement with the U.S. This policy was later applied to the concessions in the GATT.[6]

We find no evidence that U.S. negotiators systematically substituted ad valorem tariffs for specific tariffs during this period, even though inflation had substantially reduced the protection afforded by specific tariffs whose levels were set in 1930. This is particularly surprising given that roughly half the items in our dataset have a specific-tariff component during this period, and specific tariffs are much less common in modern U.S. tariffs.

Our second contribution is using this novel dataset to contribute to the empirical terms-of-trade literature. We study whether U.S. tariffs experience larger decreases between Smoot-Hawley and the first GATT round when the U.S. initially imports more of the product. In other words, we study whether the efficient tariff level is lower when non-cooperative imports are larger, conditional on the level of non-cooperative tariffs. Our tariff commitment and import data allow us to test the terms-of-trade theory in an ideal setting that is challenging to obtain in modern data: that of a large, developed trading country that moves from unilateral tariff setting to cooperative tariff setting. Overall, we provide empirical evidence consistent with predictions from the terms-of-trade theory for the U.S. To the best of our knowledge, we are the first to provide such evidence for a large, developed country, let alone for the largest trading country in the world.

The regression results provide strong support for the role of importer market power in U.S. tariffs during the first GATT round, with stronger effects than in the previous literature that has mostly focused on developing economies acceding to the WTO (e.g., Bagwell and Staiger 2011). We find that, conditional on the Smoot-Hawley tariffs and industry fixed effects, GATT tariffs are lower when the U.S. imports more of the product. The baseline OLS estimates imply a 1 standard deviation increase in 1933 U.S. import values correspond to a 2.7 percent decrease in the average GATT tariff. We show this relationship is robust to a series of alternative specifications, such as using a Tobit model to address zero tariffs, accounting for changes in unit values over time that impact AVEs, and separating trade liberalization that occurs through bilateral trade agreements versus the GATT.

Our work is related to several branches of the literature. There is a large qualitative literature on the history of U.S. trade policy and the GATT. Irwin (2017) provides a com-

[6]Page XX of the 1950 Schedule A states "All of the currently operative reduced or modified rates, including those shown with a particular country or countries, are applicable to commodities, the growth, produce, or manufacture of all foreign countries with the following exceptions...", where those exceptions are for Cuba and the Philippines.

prehensive history of U.S. trade policy, while Hoda (2018) reports a general history of the GATT. Other authors give a detailed account of specific GATT rounds, such as Evans (1971) on the Kennedy Round. Dobson (1976) focuses on the deep history of the USITC, while Rosengarten, Summers, and Butcher (2017) focus on the tariff activities of the USITC. Legal scholars provide views into the institutional details of the GATT as an instrument of international law, e.g., Mavroidis (2016), while political scientists and economic historians elucidate the political origins of U.S. trade policy, e.g., Destler (2005) and Irwin (2019).

In terms of quantitative literature, a large modern literature on trade impacts and trade policy takes advantage of detailed, machine-readable data from 1989, when the Harmonized System was enacted. Our panel data provides detailed historical U.S. data that has not been readily available to researchers. This data and concordance work builds upon other data- and concordance-creation efforts, such as Feenstra (1996), Feenstra, Romalis, and Schott (2002), and Pierce and Schott (2012), which have generally focused on data from more recent years.

Our terms-of-trade analysis is most closely related to Bagwell and Staiger (2011) who study the movement from non-WTO to WTO tariffs for 16 of the 21 countries that acceded to the WTO between January 1995 and November 2005. We extend the empirical approach used by the authors to the case of the U.S. during the transition from Smoot-Hawley tariffs to the GATT. Our estimation results provide evidence that the terms-of-trade motive may have been stronger for the U.S. over this historical period than the sample of WTO-acceding countries from 1995 to 2005, as considered by Bagwell and Staiger (2011). Another related study is Irwin and Soderbery (2021) who examine U.S. tariffs around Smoot-Hawley, highlighting the importance of terms-of-trade and political-economy motives in unilaterally-set U.S. tariffs. However, unlike our paper, the authors focus on the optimal unilateral tariff and not the change in tariffs following Smoot-Hawley.

A few other modern papers focus on the Smoot-Hawley time period. Irwin (1998) decomposes the impact of the Smoot-Hawley tariff from the impact of price changes on the incidence of specific tariffs. Bond et al. (2013) uses product-level data from 1930 and 1933 to study the productivity effects of Smoot-Hawley tariffs. Mitchener, O'Rourke, and Wandschneider (2022) study how Smoot-Hawley affected U.S. exports. Acosta and Cox (2024) study the origins and implications of the regressivity of the U.S. tariff code.

The rest of the paper is organized as follows. The next section briefly describes the historical context. Section 3 covers data collection, digitization, and concordance work. Section 4 includes summary statistics of this new dataset and stylized facts from the data. Section 5 documents our terms-of-trade analysis, including the empirical strategy, regression results, and robustness checks. Finally, Section 6 concludes.

2 Historical Context

We examine the tariff liberalization undertaken by the United States between the U.S. Tariff Act of 1930 and the first round of the GATT in 1947 (i.e., the Geneva Round).[7] This section provides a brief historical background of U.S. trade policy between 1930 and 1947.

2.1 From the Smoot-Hawley Tariffs of 1930 to the Reciprocal Trade Agreements Act of 1934

In the midst of the Great Depression, U.S. President Herbert Hoover's proposal to increase tariffs to protect the agricultural sector turned into a large and general unilateral upward revision of the U.S. tariff schedule in the Tariff Act of 1930, known as the Smoot-Hawley Act. President Hoover intended that tariffs would be reduced under the flexible tariff provisions of Smoot-Hawley. However, regret at the economic damage wrought by the tariff increases and frustration with the cumbersome and time-consuming process for reducing those tariffs led to calls for a change (Dobson 1976).

That change came in the form of the Reciprocal Trade Agreements Act of 1934 (RTAA).[8] Framed as an amendment to the Smoot-Hawley Act—as would be all tariff bills until 1962—the RTAA authorized the President of the United States to change tariff rates by as much as 50 percent with only the need to notify the public of his intentions. This delegation of tariff setting powers to the president meant that the Smoot-Hawley Act was Congress's last general revision of U.S. tariffs.

2.2 1934–1946: The Era of U.S. Bilateral Trade Agreements

Between 1934 and 1946, the U.S. concluded a series of bilateral trade agreements that became the model for the GATT negotiations. The goal was to reduce tariffs, import quotas, export restraints, and other trade barriers to encourage trade and investment. 27 nations signed bilateral agreements with the U.S. and nearly 2,000 U.S. products were impacted, accounting for about half of all items that were dutiable as of 1930. Canada even negotiated two agreements during this time with the U.S., one in 1936 and one in 1939. All commitments

[7] Sometimes the Geneva Round is referred to as Geneva I or Geneva 1947 because the later GATT round that was completed in 1956 was also named for Geneva. In this paper, reference to the Geneva Round is to the first GATT round in 1947.

[8] A short summary of the RTAA is available on the USTR website: https://ustr.gov/about-us/policy-offices/press-office/blog/2014/June/Eighty-years-of-the-Reciprocal-Trade-Agreements-Act.

except those with Cuba were extended as MFN tariffs—that is, to all trading partners regardless of whether they had trade agreements with the U.S. The distribution of these negotiations by country can be seen in Table 1. We have recorded the tariff commitments with each country in our panel data except for those in the agreement with Cuba (where the commitments were non-MFN) and the two agreements with Nicaragua and Czechoslovakia that were terminated shortly after entry in force. The results of all these bilateral agreements are consolidated in the 1946 tariffs, which is the year prior to the first GATT round. Some products were included in multiple negotiations leading to multiple changes in tariff rates throughout this period of bilateral negotiations.

Interestingly, of the twenty-three contracting parties to the original GATT in 1947, eight had bilateral trade agreements with the U.S. in this era. Six of these are included in Table 1: Belgium, Brazil, Canada, France, the Netherlands, and the United Kingdom. However, the other two, Czechoslovakia and Cuba, are excluded from our data, as previously discussed. This means that fourteen contracting parties to the GATT did not have a bilateral trade agreement with the U.S.[9]

2.3 The First GATT Round: Geneva 1947

Responding to events both at home and on the world stage, the U.S. was arguably the driving force behind the GATT. For the first GATT round in 1947, the U.S. created 28 country subcommittees to formulate tariff cut proposals based on the principal supplier rule. One of the top three suppliers of a commodity would be offered a tariff cut in return for reciprocal liberalization for U.S. goods. Then, the unconditional MFN principle would be applied to any tariff concession so that it was automatically and freely extended to all other suppliers, except a few communist countries (Dobson 1976).

By the mid 1940's, the U.S. had already made the RTAA-authorized maximum allowable reduction of 50 percent for about 42 percent of dutiable imports (also in Irwin 2017). President Truman, therefore, asked for additional authority to cut tariffs. In the Trade Agreements Extension Act of 1945, Congress gave the president the authority to reduce any tariff by 50 percent of the January 1, 1945 rate. Irwin (2017) argues that this was the "high point of legislative support for the trade agreements program," facilitated in part because supply shortages—not import competition—were the focal issue amidst World War II.

With this negotiating authority, President Truman's administration instigated multilateral

[9]This includes: Australia, Burma, Ceylon, Chile, China, India, Lebanon, Luxembourg, New Zealand, Norway, Pakistan, Southern Rhodesia, Syria, and South Africa.

Table 1: U.S. Bilateral Trade Agreements

Country	Date Effective	Number of Products	GATT?
United Kingdom	Jan. 1, 1939	890	Yes
Canada	Jan. 1, 1936, Jun. 17, 1939	395	Yes
Mexico	Jan. 30, 1943	238	
France	June 15, 1936	182	Yes
Belgium	May 1, 1935	174	Yes
Switzerland	Feb. 15, 1936	174	
Argentina	Jan. 8, 1943	149	
Peru	July 29, 1942	138	
Sweden	Aug. 5, 1935	116	
Netherlands	Feb. 1, 1936	95	Yes
Uruguay	Jan. 1, 1943	55	
Iran	Jun. 28, 1944	50	
Finland	Nov. 2, 1936	37	
Brazil	Jan. 1, 1936	31	Yes
Turkey	May 5, 1939	25	
Costa Rica	Aug. 2, 1937	22	
Iceland	Nov. 19, 1943	21	
Venezuela	Dec. 16, 1939	19	
Guatemala	June 15, 1936	18	
Ecuador	Oct. 23, 1938	17	
Haiti	June 3, 1935	14	
Colombia	May 20, 1936	14	
Honduras	Mar. 2, 1936	12	
El Salvador	May 31, 1937	8	

Notes: Effective dates are from the texts of each bilateral agreement. Number of products are counts from the 1946 Schedule A as verified in the bilateral agreement texts. The GATT column denotes contracting parties to the original GATT in 1947. The trade agreement with Nicaragua was enacted on October 1, 1936 and terminated on March 10, 1938. The trade agreement with Czechoslovakia was enacted on April 15, 1938 and terminated on April 22, 1939. We exclude Nicaragua and Czechoslovakia from our analysis, along with Cuba since commitments to Cuba were not extended as MFN tariff commitments.

trade negotiations in Geneva, Switzerland starting in April 1947. The talks lasted until October 19, 1947 and produced the GATT. As U.S. legislation only required the president to give public notice of his intention to negotiate a trade agreement and then to "seek information and advice," the U.S. made its concessions effective as of January 1948 by executive order (Dobson 1976). The GATT was purely a trade agreement, not a treaty or an organization; thus instead of members, it had "contracting parties" (Irwin 2017).

The negotiations in Geneva were multilateral in principle. Still, the way they were carried out was similar to how the U.S. had operated since 1934 under the RTAA: a team from

each country negotiated bilaterally with the representatives of several other countries on a product-by-product basis using the principal supplier rule (Irwin 2017). Once these bilateral talks were complete, each country created a single, consolidated schedule of tariffs that would be granted to all other contracting parties on an MFN basis.[10] These schedules were annexed to the GATT.

3 Historical U.S. Data

We next describe the data we use to study tariff changes between Smoot-Hawley and Geneva 1947, which we digitized from original hard-copy documents. In addition to the digitization process, we discuss challenges in creating this detailed dataset, such as concording data across classification systems and across years, and calculating AVEs.[11]

3.1 Data sources

3.1.1 Tariff Commitment Data

The United Nations Treaty Collection (UNTC) website houses the detailed GATT tariff schedules of every country of each round of GATT negotiations from the first Geneva Round to the Uruguay Round.[12] We take this to be the definitive version of the U.S. tariff schedule for Geneva 1947.

To the Geneva 1947 tariff data, we add the tariff rates from the original text of the Smoot-Hawley Act as well as those from *United States Import Duties (June 1946)*, which is a list of all the rates of duty as of just before the Geneva round of the GATT. The 1946 tariffs were compiled by the U.S. Tariff Commission, the forerunner to the USITC, to give U.S. negotiators the correct baseline from which to make concessions in the first round of the GATT. These documents are all organized using the paragraph numbers in the Tariff Act of 1930, which has 966 paragraphs, where many paragraphs cover multiple items with different tariff rates.[13] The number of distinct tariff rates within paragraphs grows over time as tariff commitments are often made so that items that previously shared a tariff see their tariff rates

[10] Page XX of the August 1, 1950 Schedule A notes that, as with the bilateral trade agreements, all the rates modified in the GATT apply to all foreign countries except Cuba and the Philippines.

[11] Additional details of the digitization process can be found in the Supplementary Online Appendix.

[12] Digitizing additional GATT rounds is an area for future work. Given this paper's focus on the U.S. moving from a non-cooperative to cooperative trade policy setting between Smoot-Hawley and the beginning of the GATT, we focus on the Geneva 1947 round.

[13] These paragraph numbers were established in the Tariff Act of 1922.

diverge. As new negotiations are concluded, products previously listed as one item—that had a single tariff rate—are often split into multiple items with different tariff rates.[14] We use the term 'item' or 'product' to refer to an observation in our dataset.

We ultimately reorganize this tariff data according to the United States' Schedule A classification system, which was used to classify import data until 1963. We did this for two reasons. First, although this import classification system is not perfectly hierarchical, the organization of Schedule A is far superior to that of the Smoot-Hawley legislation for creating a dataset on which one can reliably perform statistical analysis. Second, we want to integrate import data into the tariff data so that we can calculate AVEs.

While the Schedule A evolves over time, we have generally organized the tariff data using the 1946–1947 version of the Schedule A.[15] We chose 1946 because these tariffs are crucial in quantifying the tariff reductions in the Geneva 1947 round of GATT negotiations. We use the cross-reference in the 1946 Schedule A, along with the Smoot-Hawley and Schedule A descriptions, to manually reorganize our tariff commitment dataset by Schedule A number.

When a given year does not have information for a given item, we assume that the previous tariff rate is in effect. That is, we copy forward an item's tariff rate until a new rate appears as we move chronologically from 1930 to 1947. Our tariff dataset is therefore a balanced panel with observations for 1930 (Smoot-Hawley), 1935–1939 and 1942–1944 (bilateral trade agreements), 1946 (pre-Geneva), and 1947 (Geneva). No bilateral trade agreements entered into force during 1940–1941 or 1945-1946.

3.1.2 Import Data

We also require U.S. import data to create AVEs for descriptive statistics and the terms-of-trade analysis. We have acquired complete import data—including exporter detail—for 1935–1938 and 1947.[16] We also manually gathered total import quantities and values for 1933 and 1946.

Recall that the import data is classified by the numerical system known as the Schedule A. The data source for imports by Schedule A change over time. We acquired PDF versions of

[14] See our Section 8.3.3 and Acosta and Cox (2024) for in-depth examples.

[15] The 1946 Schedule A document includes "Commodity numbers", which we refer to as Schedule A numbers; product descriptions, units of quantity, Smoot-Hawley tariff levels, Smoot-Hawley paragraph numbers, and 1946 tariff levels, as well as the source of each tariff change between 1930 and 1946, be it unilateral or through a bilateral trade agreement that became an MFN tariff.

[16] All of these except the 1935 data were previously compiled under NSF Project 1326940 and graciously shared with us by Bob Staiger and Tricia Mueller. We contracted with an external service to help use digitize the 1935 data.

the Department of Commerce publication *Foreign Commerce and Navigation of the United States* for each calendar year from 1929 to 1946. These documents contain not only import quantity, unit of measure, and value, but also the tariff rate, duties collected, and AVEs for specific tariffs in some years. This document was discontinued after 1946, so for 1947, we use PDF versions of the Census publication *United States Imports of Merchandise for Consumption Commodity by Country of Origin (FT 110)* that provide tables of import values, quantities, and units of measure.

We use the Merchandise for Consumption series throughout for two reasons. First, they are available for every year until 1962, unlike the General Imports of Merchandise tables, which we could not find for all years. Second, the Merchandise for Consumption series represents the imports on which tariffs are applied. The primary difference between the two series is that the General Imports of Merchandise tables include imports that entered bonded warehouses in the U.S. but did not enter the U.S.'s customs territory during the same year.[17]

3.2 Concordances

3.2.1 Smoot-Hawley Paragraphs to Schedule A Numbers

Because we collected tariff data under the Smoot-Hawley paragraph numbers and import data under Schedule A numbers, we create a concordance between these two classification systems. We used the cross-reference in the 1946 Schedule A, along with the Smoot-Hawley and Schedule A descriptions, to manually reorganize our tariff commitment dataset by Schedule A number. In this paper, we use Schedule A numbers to organize the data, and we maintain the concordance to Smoot-Hawley for future use.

3.2.2 Schedule A Numbers Over Time

In addition to concording from Smoot-Hawley paragraph numbers, we also create a concordance to account for revisions that occur over time to the Schedule A numbers. This concordance accounts for Schedule A revisions between 1933 and 1947, where 1933 is the first year of import data we use. This concordance was mostly completed by hand, using information on the changes in intermediate years to make sure we have the correct mapping across this time period.[18] Out of nearly 6,000 entries in our concordance, more than 60

[17] Irwin and Soderbery (2021) use the General Imports of Merchandise series for the late 1920s and early 1930s, where full country-product detail is available.

[18] Details are in the Data Appendix, in Section 8.1 for the data sources and Section 8.2 for the concordances.

percent of the items either kept the same Schedule A number and description, or keep the same description but simply changed the Schedule A number. Over a quarter of items in 1947 had been split into at least two codes where there was only one code in 1933. About 400 items were merged into larger categories, and 352 products were newly created.

3.3 Calculating AVEs

To analyze all tariffs on the same basis, we calculate the AVEs for all products with a specific-tariff component by combining the tariff commitment data with the import data.[19] We first calculate unit values by dividing import values by import quantities, ensuring that the specific tariff units and import quantity units align for each product.[20] For compound tariffs, we then add the ad valorem component to the AVE of the specific component. The process is a bit more complex for products with 'mixed' tariffs, where the tariff is either specific or ad valorem. These products have a given rate but also a minimum and/or maximum rate. Sometimes the given rate is ad valorem and sometimes it is specific; the minimums/maximums are always of the opposite type. Therefore, we calculate the AVE of the specific component(s) and compare to the ad valorem component(s) to determine which rate applied. Appendix 8.3.2 provided more details on mixed tariffs.

Although we use AVEs for the term-of-trade analysis in order to have the most comprehensive dataset, for some summary statistics in the next section it can be helpful to look at specific and ad valorem tariffs separately. In particular, AVEs are impacted by changes in unit values—such as inflation—which makes it challenging to determine whether changes in AVEs over time are due to tariff changes or changes in unit values. To account for this, we also present results using AVEs that hold the unit values at 1933 levels as a robustness check.

Underlining the challenges with comparing specific tariffs, we find that the Smoot-Hawley tariff system employed 54 types of units for specific tariffs. We can reduce this to 23 types of units through a normalization process, such as integrating units that have similar descriptive meanings (e.g., 'cents per dozen articles' and 'cents per dozen pieces'), integrating units that are multiples of each other (e.g., cents per each, cents per 100 and cents per 1,000), and transforming all dollars-based units to cents-based units (e.g., dollars per pound to cents per

[19] For Smoot-Hawley AVEs, we use 1933 unit values; for 1946 AVEs, we use 1946 unit values; for Geneva AVEs, we use 1947 unit values. In cases where we are unable to calculate unit values (e.g., if import values or quantities are missing or are zero), we do not attempt to calculate an AVE. Around 700 products are impacted by this issue.

[20] See Appendix C of Teti (2020) for a clear and concise explanation of conversion of specific tariffs into AVEs.

pound). After this transformation, only five units appear more than five times in our data: cents per ounce, cents each, cents per square foot, cents per foot, and cents per cubic foot.

3.4 Additional Data Processing

While digitizing the tariff and import data, we undertook additional processing steps to address several complexities in the data. These steps were mostly aimed at ensuring the robustness and completeness of our dataset, so we provide detailed explanations, including examples and the solutions applied, in the Appendices.

Appendix 8.3.3 explains how we address the increasing granularity of product descriptions over time. Appendix 8.3.4 details five U.S. legislative provisions that typically impacted tariffs unilaterally, such as the Sugar Act. We created an indicator variable that allows the 36 products subject to a quota to be easily dropped from the analysis.

Section 3 of the Supplementary Online Appendix provides details about how we consolidated a few groups of products, such as certain subcategories of cotton textiles, where one tariff formula was negotiated that applied to multiple Schedule A codes.

4 Summarizing U.S. Tariff Liberalization from Smoot-Hawley to the GATT

Given that, to the best of our knowledge, this is the first time detailed time-series AVE tariff data between Smoot-Hawley and Geneva 1947 has been digitized, we provide general summary statistics, trends, and stylized facts before presenting our empirical test of the terms-of-trade theory.

4.1 There is a Gradual Reduction in Tariffs Over Time

Table 2 confirms a well-known stylized fact: that U.S. tariffs experienced a relatively large decrease between Smoot-Hawley and the first round of the GATT in 1947.[21] We find that from the Smoot-Hawley tariffs in 1930 to Geneva 1947, both specific and ad valorem tariffs were cut by a third or more when considering only products that were dutiable in 1930.

[21] The U.S. had three sets of applicable tariffs at this time: the unilateral preferences given to the Philippines, the bilateral trade agreement concessions to Cuba, and the set of tariffs that were applied to all other countries. We focus on this last set of tariffs—which include concessions made in all trade agreements except the one with Cuba—throughout the paper.

Table 2: Summary Statistics for Ad Valorem, Specific, and AVE Tariffs

Panel A: Ad Valorem Tariffs (percent)

	Mean	Median	Min	Max	N
Smoot-Hawley	39.12	35	5	110	1990
1936	36.59	33.33	4	110	1990
1939	33.75	30	4	110	1990
1943	32.92	27.5	2.5	110	1990
1946	32.65	27.5	2.5	110	1990
Geneva	24.49	20	2.5	110	1990

Panel B: Specific Tariffs (cents)

	Mean	Median	Min	Max	N
Smoot-Hawley	44.36	4.5	0.00375	3000	1390
1936	39.14	4	0.00375	3000	1390
1939	35.44	4	0.00375	3000	1390
1943	32.08	3.625	0.00375	1500	1390
1946	31.49	3.5	0.00375	1500	1390
Geneva	26.66	3	0.00375	1400	1390

Panel C: Ad Valorem Equivalents (percent)

	Mean	Median	Min	Max	N
Smoot-Hawley	48.55	40	0.16	742.27	3861
1946	32.04	25	0.04	512.21	3676
Geneva	24.41	20	0.03	205.56	3715

Notes: All three panels exclude non-dutiable items. Panel A includes products that have only an ad valorem tariff throughout the period. Panel B includes products that have only a specific tariff throughout the period and standardizes the units in which the specific tariffs are expressed wherever possible. Panel C includes products with all tariff types, but excludes products for which unit values, and hence AVEs, cannot be calculated. This occurs for about 700 products whose tariff has a specific component but for which there were zero imports and for about two dozen products with positive imports for which no dollar value of imports is reported.

Almost three-quarters of the 5,299 items in our dataset have an ad valorem component. This count includes 854 items—about 16 percent of the total—that are duty-free under Smoot-Hawley and remain that way throughout the period. In addition, 790 items—another 15 percent—have a compound tariff, that is, they have both an ad valorem and specific component in a given year. A further four percent of products have a mixed tariff, meaning the tariff rate is either ad valorem or specific, depending on which is higher. We exclude all these items that are either duty-free or that have complicated tariffs from Panels A and B of Table 2 to allow for a clear comparison between ad valorem and specific tariffs.

Panel A of Table 2 shows that, for these items with only ad valorem tariffs (covering about 38 percent of products), the mean ad valorem tariff binding decreases from 39.12 percent in 1930 to 24.49 percent in 1947. The medians are similar to the means, dropping from 35 percent to 20 percent. For items with only specific tariffs (covering about 30 percent of products), Panel B shows that the mean specific tariff binding decreases from 44.36 cents in 1930 to 26.66 cents in 1947, while the median bindings are much smaller, dropping from 4.5 cents to 3 cents.[22]

Panel C of Table 2 shows the same statistics but substitutes AVEs calculated using same-year unit values from the import data. The sample size is almost double the number of products that have non-zero ad valorem tariffs, which are the only tariffs that can be cleanly studied without calculating AVEs. Focusing on the Geneva Round, we can calculate AVEs for 954 products with specific tariffs throughout the period, 133 with mixed tariffs throughout the period, and 516 with compound tariffs throughout the period. 122 more products are added for Schedule A codes for which the form of the tariff changed between Smoot-Hawley and the Geneva round. Thus, gathering import data and using it to calculate AVEs allows us to increase the sample of dutiable tariffs by 87 percent. In Section 4.3 below, we will show that the products that would be excluded if one did not calculate AVEs are not randomly distributed across product types, making it even more important to gather and concord import data to make it possible to include these products in the analysis.

In Panel C, we see that, from the Smoot-Hawley tariffs to the Geneva round, the mean AVE tariff binding decreases from 48.55 percent in 1930 to 24.41 percent in 1947. This corresponds to a nearly 50 percent decrease; this is larger in magnitude than when looking at ad valorem (37 percent decrease) and specific (40 percent decrease) tariffs separately. Tariffs drop more when measured by AVEs for two reasons. First, products for compound tariffs are excluded from Panels A and B, and these products have much higher average AVEs to begin with and decrease more than the other types. Second, we use 1933 import data to calculate the

[22]Summary statistics throughout the paper are not trade weighted.

Smoot-Hawley AVEs and 1947 import data to calculate the Geneva AVEs; inflation over this period would have reduced the AVEs even without any changes to the bindings.

To isolate the contribution of negotiated liberalization and remove the influence of inflation on AVEs, Table 3 presents summary statistics for AVEs that hold unit values constant using 1933 unit values. When holding unit values constant, the decrease in mean AVEs is smaller, but still large with a 35 percent decrease between Smoot-Hawley and the Geneva round.

Table 3: Summary Statistics for AVEs using 1933 Unit Values (percent)

	Mean	Median	Min	Max	N
Smoot-Hawley	48.55	40	0.16	742.27	3861
1935	47.94	38.9	0.16	742.27	3862
1936	45.58	35.01	0.16	742.27	3863
1937	45.57	35.01	0.16	742.27	3863
1938	45.57	35.01	0.16	742.27	3863
1939	42.73	34.11	0.16	742.27	3866
1942	41.49	33.33	0.16	742.27	3866
1943	40.12	31.49	0.16	742.27	3866
1944	40.03	31.33	0.16	742.27	3866
1946	39.54	30.9	0.16	742.27	3867
Geneva	31.75	25	0.16	742.27	3872

Notes: Excludes non-dutiable items and products for which unit values, and hence AVEs, cannot be calculated. This occurs for products whose tariff has a specific component but for which there were zero imports in 1933 and for products with positive imports in 1933 for which no dollar value of imports is reported. Although the Schedule A is not available for all years, we record bilateral trade agreement concessions in the year corresponding to the trade agreement listed in the 1946 Schedule A. We confirm the tariff level and year in the texts of the bilateral trade agreements.

4.2 Bilateral Trade Negotiations are Important

Regardless of which tariff measure above is used, what may be surprising to many is that the U.S. was active in negotiating bilateral agreements prior to the start of the GATT negotiations. Across all four measures presented in Section 4.1, at least half, if not more, of the reduction in U.S. MFN tariffs between Smoot-Hawley and Geneva 1947 is directly attributable to the bilateral trade agreements; this is because the U.S. converted all its bilateral concessions into MFN tariffs.[23] In Table 3, the reduction between Smoot-Hawley

[23]Only the trade agreement with Cuba did not have its commitments extended in this way. The U.S. also gave the Philippines non-agreement preferential tariffs and did not extend these as MFN tariffs either.

and 1946 is about 19 percent, which is not that different from the 21 percent reported in Irwin (2017, p. 485) that uses more aggregated tariff data. Thus, bilateral negotiations between 1934 and 1946 made an important contribution to the statutory liberalization of this era.

Two related, but distinct measures shown in Figure 1 provide a first glimpse into the breadth of negotiations. The (red) dots show how many items with non-zero tariffs in 1930 saw new commitments in each year.[24] Geneva 1947 saw the largest number of items with commitments of any year: 2,037. The trade agreement with Ecuador in 1938 saw the fewest new commitments at just one out of the seventeen items on which the U.S. made commitments in this trade agreement; that is, the other sixteen items had already seen a reduction in a previous trade agreement.

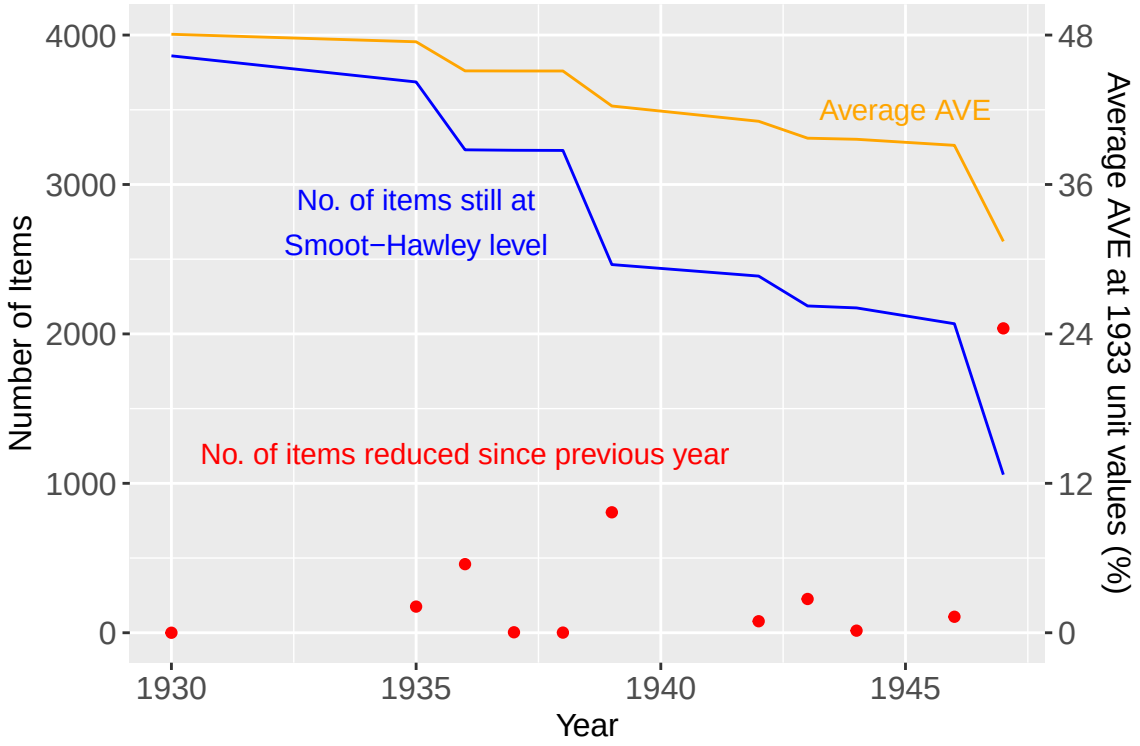

Figure 1: Tariff Reductions: Number of Items and Average Tariffs

Notes: The left axis shows the number of items that were reduced in each year (red) and a linear interpolation of the total number of items that remained at their 1930 level. The right axis shows a linear interpolation of the average AVE across all items in each year, holding unit values at 1933 levels. No bilateral trade agreements came into force in 1931-1934, 1940, 1941, 1945 or 1946. The small number of changes indicated by the red dot above 1946 are for unilateral tariff changes.

[24]There were 1,438 items that were duty-free throughout the period or for which we do not have import data to calculate AVEs.

The dark (blue) line indicates the number of items that had no negotiated change from Smoot-Hawley at each point in our data. For instance, between Smoot-Hawley and the start of the Geneva talks in 1946, about half of the items with non-zero Smoot-Hawley tariffs had some negotiated commitment.[25] Although 2,037 received commitments by the U.S. in the Geneva round, only 1,010 of the items received commitments for the first time. By the end of the Geneva round, only 1,058 items remained with no negotiated commitment. For context, the light (orange) line visualizes the mean AVEs using the 1933 unit values from Table 3. This underlines the fact, discussed above, that while the magnitude of the reductions in AVEs were generally limited by statute, there was no such restriction on the number of products on which tariffs could be cut.

4.3 Tariffs Display Significant Heterogeneity Across Product Categories

The summary statistics above hide variation in the speed and magnitude of liberalization across products. In the Schedule A, products are arranged into eleven industry groups; Table 4 lists these groups and shows the distribution of tariff types across them.

These industry groups range in size from 197 items for Edible Animal Products (Group 00) to 796 items for Textiles (Group 3). There is also variation in the proportions of specific, ad valorem, compound, and mixed tariffs across groups.[26] Only five items in the Machinery group (Group 7) have a specific component, while all items have an ad valorem component. On the other hand, the Edible Animals group (Group 00) has only 56 of its 317 items without a specific tariff component. Three groups have fewer than four percent of items with compound tariffs, while over 30 percent of items in Group 4 (Wood and Paper) have compound tariffs.[27] The group with the largest number of compound tariffs is Group 9 (Miscellaneous), which has 188 items with compound tariffs. This heterogeneity in tariff form, and the fact that different units for specific tariffs tend to be concentrated in different groups makes it essential that we make comparisons among groups based on AVEs.

Table 5 presents the mean AVEs for these groups from Smoot-Hawley and Geneva. We also include AVEs for 1939 and 1946 to provide some additional insights into the impact of bilateral trade agreements prior to the GATT. We continue to use constant 1933 unit values

[25] This does not necessarily imply that negotiators made commitments on half the existing items, as some of the products in the 1930 Schedule A were later split into multiple Schedule A numbers.

[26] Here, we include non-dutiable items in the Ad Valorem category.

[27] 128 items switch tariff type at some point. The counts in Table 4 use the tariff form under Smoot-Hawley. See Section 4.5 for more details.

Table 4: Industry Groups in Schedule A

Group	Title	Count of Tariff Type				Total Items
		AV	Specific	Compound	Mixed	
00	Animals and animal products, edible	59	112	5	21	197
0	Animals and animal products, inedible	317	25	31	76	449
1	Vegetable food products and beverages	132	350	5	0	487
2	Vegetable products, inedible	294	96	23	1	414
3	Textile fibers and manufactures	499	120	149	28	796
4	Wood & paper	198	38	105	0	341
5	Nonmetallic minerals	272	132	87	10	501
6	Metals and manufactures	348	254	127	2	731
7	Machinery and vehicles	214	0	5	0	219
8	Chemicals and related products	218	182	98	0	498
9	Miscellaneous	338	140	188	0	666

Notes: The Schedule A groups products into eleven industry groups. Both the number of products and the types of tariffs vary widely across groups. The counts here are for the tariff type (AV for Ad Valorem, Specific, Compound, and Mixed) under the Smoot-Hawley Act in 1930. Changes in tariff type by 1947 are discussed in Section 4.5.

for these AVEs.

Tariff liberalization through bilateral agreements and the Geneva round across the industry groups was broad-based. For example, every group saw a reduction in AVEs of at least eight percent from Smoot-Hawley until 1939, and at least 11 percent from Smoot-Hawley until 1946.[28] Across the industry groups, the magnitude of the average tariff decrease varies. Between Smoot-Hawley and the Geneva round, Groups 8 (chemicals) and 9 (miscellaneous) experienced tariff decreases around 27 percent, while Group 1 (edible vegetables) had a decrease in the mean tariff of just over 40 percent.

4.4 Tariff Increases are Rare

Although it is rare, we see a few instances of tariffs increasing over the period 1930–1947. There are only 95 cases where the AVE of the Geneva tariff is higher than the AVE of the Smoot-Hawley tariff. Most of these are not due to statutory increases, but rather to reductions in the unit value from 1933–1947. These increases are scattered across all the groups except Group 7 (Machinery & Vehicles).

There was, however, a statutory tariff increase for 21 products. That is, for these products, the AVE of the Smoot-Hawley tariff is lower than the AVE of the Geneva tariff at 1933

[28] Bown and Irwin (2017) present summary data from the USITC on the reduction in rates from Smoot-Hawley to just before Geneva and then to the Geneva rates using aggregated data.

Table 5: Mean AVE Tariffs (1933 Unit Values) by Industry Groups, Smoot-Hawley to Geneva

	AVEs				Percentage Decrease		
Group	SH	1939	1946	Geneva	SH to 1939	SH to 1946	SH to Geneva
00	36.3	32.0	28.9	22.3	11.8	20.5	38.6
0	26.8	22.8	21.7	16.7	14.7	19.1	37.5
1	52.8	48.3	36.7	31.3	8.5	30.5	40.8
2	20.5	17.4	17.0	13.9	15.2	17.2	32.3
3	55.7	49.2	45.7	35.0	11.6	18.0	37.1
4	23.4	20.2	19.4	15.7	13.8	17.0	32.8
5	36.5	33.0	29.9	23.5	9.7	18.1	35.5
6	42.8	38.1	36.8	28.9	11.0	14.1	32.4
7	27.8	22.8	22.7	16.8	18.3	18.6	39.8
8	31.5	28.6	28.0	23.0	9.3	11.1	26.8
9	52.1	44.4	43.7	38.0	14.7	16.1	27.0

Notes: The Schedule A groups products into eleven industry groups and the rate of tariff reduction varies across these troups. The second through fifth columns give the mean tariff by group in June 1930 (SH stands for the Smoot-Hawley Act of 1930), midway through the bilateral reductions in 1939, at the end of bilateral reductions in 1946, and after the Geneva (first) round of the GATT was concluded. The last three columns show the decreases from 1930 to 1939, 1946, and 1947 (Geneva).

unit values. Most of these increases are caused by unilateral U.S. actions such as Section 336 or the Sugar Act.[29] In two cases—both types of fur hats—the increase is caused by a change in the form of the tariff combined with a low unit value. The tariff for Schedule A number 0754 000 changed from compound to specific with an ad valorem minimum, while the tariff for Schedule A number 0754 500 switched from compound to ad valorem. In one final case, Schedule A number 9760 500—combs made of cellulose compounds—the tariff form (compound) did not change, but the values did. Under Smoot-Hawley, the specific part was 2 cents each and the ad valorem part was 35 percent; in Geneva, the tariff was 3 cents each plus 20 percent ad valorem with a 1933 unit value low enough to create an increase in the AVE.

4.5 Switching between Ad Valorem and Specific Tariffs is Also Rare

Given that inflation was reducing the incidence of specific tariffs during this period (Irwin 2017), one might have expected specific tariffs to be converted into ad valorem tariffs to

[29] See Appendix 8.3.4 for details.

avoid a loss of protection. Another reason we might expect this conversion is simply that only eight percent of U.S. tariffs were specific during the three decades since 1988 (Teti 2020).

However, from 1930 to 1947, the tariff for only 128 products changed form. Surprisingly, the most common change was transforming an ad valorem tariff into a mixed tariff, that is, where a tariff of one type is bracketed by minimum and/or maximum rates of another type for a single product. This was the case for 45 products, about a third of which were concentrated in the Textiles group while the rest were scattered throughout groups 5 through 9.

Almost the same number of products moved out of the specific category, with 20 becoming mixed, 19 becoming ad valorem, and 5 becoming compound. All but three of these were in nonmetallic minerals (Group 5) or metals (Group 6).

Of products that had compound tariffs under Smoot-Hawley, 26 shifted to mixed tariffs by 1947, while 12 more shited to ad valorem. There was only one product that had a mixed tariff under Smoot-Hawley whose tariff form changed by 1947—to ad valorem. These changes were distributed fairly evenly across groups.

Thus, we see no clear pattern of moving toward or away from one type of tariff over this period. This means that the reduction in the prevalence of specific tariffs must come in later rounds of the GATT. Greenland, Lake, and Lopresti (2023) find that there are still a significant number of specific lines in the Tokyo Round, suggesting that the switch from specific to ad valorem took place at a later date.

5 Terms-of-Trade Analysis

The previous section provided an overview of the wide-ranging U.S. tariff liberalization following Smoot-Hawley through the first GATT round in 1947 using the data as described in Section 3. In this section, we use this same tariff data merged with U.S. import data to better understand what drove U.S. tariff changes over this period, focusing on the terms-of-trade motive as one possible explanation.

5.1 Theoretical Motivation

The terms-of-trade theory has deep roots in the literature, dating back to at least Johnson (1953). It posits that countries with importer market power face a temptation to set higher import tariffs to shift the cost of protecting domestic industries onto their trading partners.

Acting on this importer market power when setting tariffs unilaterally results in tariffs that are generally higher than the level that optimizes the country's welfare. Trade agreements lead to lower, more efficient tariff levels.

Bagwell and Staiger (2011) show the terms-of-trade theory can used to define a relationship that predicts the level of negotiated tariffs from pre-negotiation information on tariffs (τ), import volumes (M), prices (p), and import demand (σ) and foreign export supply (ω^*) elasticities. For a domestic product, the following expression can be derived:

$$\tau^{PO} = \beta_0 + \beta_1 \tau^{BR} + \beta_2 (\sigma^{BR}/\omega^{*BR})(M^{BR}/p^{BR}). \tag{1}$$

The superscript PO denotes the politically optimal level for the domestic government after entering trade negotiations, and BR denotes the best-response level in the absence of trade negotiations (i.e., pre-negotiation). The authors establish that the terms-of-trade theory predicts that $\hat{\beta}_1 > 0$ and $\hat{\beta}_2 < 0$.

Moreover, Bagwell and Staiger (2011) demonstrate that, in the case of linear demand and supply, the terms-of-trade theory yields a more straightforward form of the above expression. In this case, the negotiated tariff cut should be larger in magnitude when the ratio of pre-negotiation import volume to world price (denoted m^{BR}) increases. This can be represented by the following:

$$\tau^{PO} = \beta_0 + \beta_1 \tau^{BR} + \beta_2 m^{BR}. \tag{2}$$

5.2 Empirical Strategy

To study the relationship between importer market power and the change in tariffs between Smoot-Hawley and the Geneva round, we extend the Bagwell and Staiger (2011) empirical strategy to the case of U.S. GATT and Smoot-Hawley tariffs with the following fixed effects regression model:

$$\tau_g^{GATT} = \alpha_G + \beta_1 \tau_g^{SH} + \beta_2 V_g^{1933} + \varepsilon_g, \tag{3}$$

where τ_g^{GATT} is the U.S. bound Geneva 1947 tariff on the 7-digit Schedule A product g and τ_g^{SH} is the U.S. bound Smoot-Hawley tariff. AVEs are used for this analysis to avoid challenges with separately comparing ad valorem and specific tariffs. V_g^{1933} is the U.S. import value in 1933. As we use U.S. import data, we follow the primary empirical approach used in Bagwell and Staiger (2011) and replace the m^{BR} variable in Equation 2 with U.S. import

values in Equation 3.[30] To account for the right skewness in the import data, we also consider replacing the level of U.S. import values with the log transformation and a binary variable that denotes import values above the median import value. The detailed trade data is at the tariff line level, so we infer that imports with no recorded import value are zero.[31]

The variable α_G denotes the 93 industry fixed effects for Schedule A subgroups.[32] These subgroups are similar to 2-digit fixed effects when using the modern HS system; however, directly using the first 2 digits of Schedule A codes as fixed effects is not preferred as the Schedule A codes do not follow a rigorous hierarchical structure like HS codes do. These fixed effects allow for the comparison of 7-digit products within the same industry and control for industry-level characteristics that could impact U.S. trade policy, including the political economy environment for each industry. Using fixed effects to control for a wide range of observables and unobservables is particularly useful as there are limited historical data readily available to link to our dataset. Finally, ε_g is the error term and we use OLS estimation with heteroskedasticity-robust standard errors.

In relation to the terms-of-trade theory, τ_g^{GATT} proxies for the efficient politically optimal tariffs, while τ_g^{SH} and V_g^{1933} proxy for the U.S. unilateral best-response tariffs and import values, respectively. As previously discussed, Bagwell and Staiger (2011) show that the terms-of-trade theory predicts that $\hat{\beta}_1 > 0$ and $\hat{\beta}_2 < 0$. In other words, conditional on the level of non-cooperative tariffs, the efficient tariff level should be lower when non-cooperative imports are larger. Moreover, the authors note that $\hat{\beta}_2$ approaches zero in the case of a small economy relative to the world market for a given product. Given the focus by Bagwell and Staiger (2011) on developing economies in their empirical application, we expect our $\hat{\beta}_2$ estimates to be larger in magnitude as we focus on the case of a developed economy that was the largest in the world during the period under study (Irwin and Soderbery 2021).

We use 1933 import values for both V_g^{1933} and to compute AVEs of specific tariffs for τ_g^{SH}. We choose 1933 as the base year for three reasons. First, using 1933 instead of 1930 gives U.S. imports a few years to adjust following the passage of Smoot-Hawley. Since we are interested in a measure of non-cooperative import values, import data must reflect trading

[30] In other words, we do not use U.S. unit values to infer world prices to calculate m^{BR} in Equation 2. As the U.S. was the largest economy in the world at this time, the prices it faced are not a good proxy for world prices.

[31] Thirteen products have data available for Smoot-Hawley and Geneva AVE tariffs, but have positive import quantities listed and are missing import values. In these cases, we do not replace the import values with zeros.

[32] These groups are defined on page VII of the 1950 Schedule A in a table entitled "Import Commodity Group and Subgroup Code Designations." We verify that the boundaries between groups is the same in the 1946 Schedule A around which our data is organized.

conditions under the Smoot-Hawley tariffs. Second, 1933 was the last year of widespread deflation in the U.S., so this puts us near the trough in prices. Finally, 1933 was the last year before the RTAA in 1934, which authorized the beginning of trade negotiations following Smoot-Hawley. As previously discussed and a point we return to with a robustness check, the RTAA resulted in the U.S. signing bilateral trade agreements prior to the Geneva round.

5.3 Terms-of-Trade Summary Statistics

Table 6 includes the summary statistics for the variables in Equation 3 as well as those used in robustness checks we introduce below. The baseline sample of 4,332 products differs in two ways from the sample used for the summary statistics in Section 4. First, it excludes products that have missing values for any of the three key variables: Geneva AVE tariffs, Smoot-Hawley AVE tariffs, and 1933 import values. Second, it includes non-dutiable items. In the baseline sample, 859 of the Smoot-Hawley tariffs are already duty-free. As Smoot-Hawley tariffs were set unilaterally and the U.S. *could* have increased these tariffs, duty-free products in Smoot-Hawley that continued to be duty-free in the Geneva round are informative to understanding trade policy over this period. The inclusion of duty-free Smoot-Hawley tariffs is also consistent with the approach used by Bagwell and Staiger (2011), where the authors included pre-WTO duty-free products.

The mean Geneva tariff of 19.46 percent is well above duty-free treatment and is about half of the mean Smoot-Hawley tariff of 37.91 percent. As expected, this implies that studying U.S. tariff outcomes from the GATT is not the trivial case of predicting free trade for all products.

Table 6: Terms-of-Trade Summary Statistics

	Mean	Std. Dev.	Min	Max	N
Smoot-Hawley AVE Tariff (1933 Unit Values)	37.91	36.80	0	581.48	4,332
AVE Tariff Prior to Geneva (1946 Unit Values)	25.01	23.60	0	331.20	4,191
Geneva AVE Tariff (1947 Unit Values)	19.46	19.85	0	192.23	4,332
Geneva AVE Tariff (1933 Unit Values)	24.62	26.66	0	407.04	4,332
1933 Import Value	0.29	2.88	0	124.14	4,332
Log 1933 Import Value	-4.15	2.74	-13	4.82	3,685
High 1933 Import Value	0.50	0.50	0	1.00	4,332

Notes: Import values are in millions of U.S. dollars. AVEs are listed as percentages. The sample size decreases slightly for the variable "AVE Tariff Prior to Geneva (1946 Unit Values)" due to the availability of 1946 import values and quantities used to calculate 1946 unit values. See Section 3.3 for details of calculating AVEs. The "Log 1933 Import Value" variable drops observations that have an import value of zero.

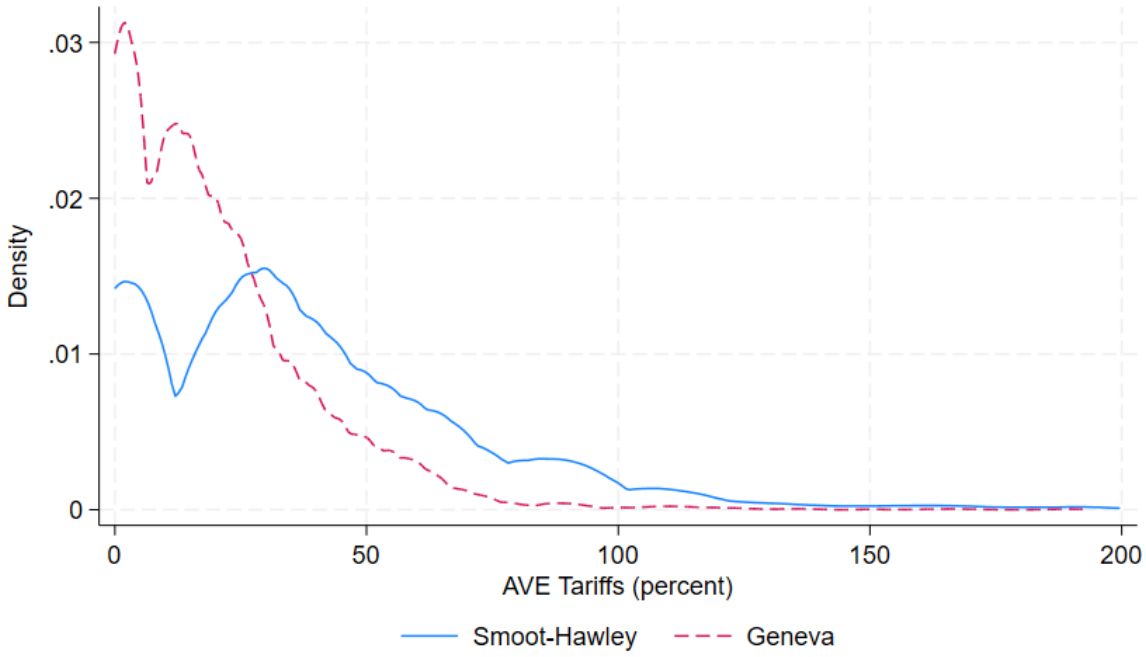

Figure 2: Distribution of Tariffs

Notes: For ease of exposition, several AVE tariffs above 200 percent are omitted from the figure. Smoot-Hawley AVE tariffs use 1933 unit values to calculate AVEs for observations that include specific tariffs. Geneva AVE tariffs use 1947 unit values.

To provide further insight into the distribution of tariffs, Figure 2 plots the kernel densities for Smoot-Hawley and Geneva AVE tariffs. There is a leftward shift in the distribution of tariffs in the Geneva round relative to Smoot-Hawley, showing tariff decreases are prevalent across products.

Finally, the mean 1933 import value is about $290,000 and has a wide range of variation with a standard deviation of $2.88 million. The median import value is $12,183 and this threshold is used to define the binary variable of high 1933 import values (i.e., the binary variable equals to one when imports are above the median and zero otherwise). 647 of the 4,332 observations have a 1933 import value of zero, so the sample decreases to 3,685 observations when using the log of 1933 import values.[33]

[33]Regarding zero import values, Bagwell and Staiger (2011) also notes that, "the terms-of-trade theory therefore also predicts that we should observe small negotiated tariff cuts on products where the importing country has raised its tariffs to near prohibitive levels, regardless of the foreign export supply elasticity that it faces" (pg. 1244). Prohibitive tariff levels imply that import values go to zero, so to provide some insights on this prediction, we compare the mean tariff cut between Smoot-Hawley and the Geneva round for products with zero imports in 1933 to those with positive imports in 1933. For products with zero imports, the mean tariff decrease is about 12 percentage points, while for positive imports the decrease is about 19.6 percentage points. Thus, as predicted by the terms-of-trade theory, products with zero imports face smaller

5.4 Main Regression Results

Table 7 presents the results of Equation 3. Column 1 includes import values in millions of U.S. dollars. The estimate on Smoot-Hawley tariffs is positive and significant at the 1 percent level, while the estimate on import values is negative and significant at the 1 percent level. Both estimates are consistent with the terms-of-trade theory predictions and imply, conditional on the Smoot-Hawley tariffs, Geneva tariffs are lower when the U.S. imports more of the product. Column 2 uses a log transformation of import values to account for the few larger import values relative to the overall sample. Using log imports results in observations with zero import values being dropped.[34] The estimate on log import values is also negative and significant at the 1 percent level. As predicted, the estimate on Smoot-Hawley tariffs continues to be positive and significant and is similar across columns 1–3. To further explore how larger import values influence the results, we use the binary variable of high 1933 import values that indicates whether imports are above the median import value. This estimate in column 3 is negative and significant, which is also consistent with the terms-of-trade motive.

To quantify the economic significance of $\hat{\beta}_2$ in Equation 3, we consider a 1 standard deviation change in the import values relative to the mean GATT tariff. Using the point estimates in column 1, a standard deviation increase in import values, all else equal, reduces bound GATT tariffs by about 0.52 percentage points ($-0.179 \times 2.88 = -0.5155$). The mean GATT tariff is 19.46 percent, which implies about a 2.7 percent decrease in the average GATT tariff ($0.52/19.46 = 0.027$). In comparison, this is larger than the overall result from Bagwell and Staiger (2011), where their estimates imply a 1.7 percent decrease in the average bound WTO tariff. To interpret the remaining import value variables, the point estimate on the log import value in column 2 implies that doubling US import values, all else equal, reduces bound GATT tariffs by about 0.38 percentage points. The column 3 estimate on the binary import value variable implies that high levels of US import values, all else equal, reduces bound GATT tariffs by about 1.79 percentage points.

About 20 percent of the Geneva tariffs in our sample (or 847 observations) are duty-free. If disturbances are normally distributed and homoskedastic, this suggests that a Tobit model may be preferred over the OLS model. The Geneva tariffs are technically not censored, but have a lower bound of zero as tariffs are not negative. Nevertheless, we use a Tobit model as one robustness check and report the results in columns 4–6.

tariff decreases, on average.

[34] The number of observations decreases by one compared to the number of observations listed for log imports in Table 6, as one product is the only observation in an industry fixed effect grouping (i.e., a singleton observation) and it is dropped from the regression.

Table 7: Terms-of-Trade Baseline Results

Dependent Variable: Geneva AVE Tariff (1947 Unit Values)	OLS			Tobit		
	(1)	(2)	(3)	(4)	(5)	(6)
Smoot-Hawley AVE Tariff	0.290***	0.271***	0.290***	0.339***	0.315***	0.339***
	(0.022)	(0.024)	(0.022)	(0.008)	(0.009)	(0.008)
1933 Import Value	-0.179***			-1.482***		
	(0.061)			(0.319)		
Log 1933 Import Value		-0.382***			-0.601***	
		(0.096)			(0.108)	
High 1933 Import Value			-1.787***			-2.490***
			(0.421)			(0.523)
Observations	4,332	3,684	4,332	4,332	3,684	4,332
R-squared	0.534	0.534	0.535			
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Standard errors in parentheses (OLS are heteroskedasticity-robust). The log of 1933 import values drops observations that have an import value of zero. The Tobit model specifies zero as a lower limit of the dependent variable. Smoot-Hawley AVE tariffs use 1933 unit values to calculate AVEs for observations that include specific tariffs. Singleton observations are dropped. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

The Tobit results provide additional support for the terms-of-trade theory predictions.[35] The point estimates on the import variables continue to be significant and are more negative than the OLS results. In column 4, the magnitude of the import value estimate increases by over eight fold, while in columns 5 and 6 the increase in magnitude is more modest at about 57 percent and 39 percent, respectively. However, the Tobit point estimates are not the best measure to compare to the OLS coefficients, so we also compute the average marginal effect of the change in 1933 import values conditional on positive tariffs for the Tobit model. We find that the adjusted Tobit coefficients are larger in absolute value than the OLS estimates, yet smaller than the Tobit point estimates.[36] We view the Tobit results as evidence that accounting for the non-negativity constraint on tariffs provides further support for the terms-of-trade theory predictions.

[35] In all robustness checks below, we include OLS and Tobit estimation results to highlight that the general findings are supported by both models.

[36] Results are available upon request.

5.5 Additional Robustness Checks

5.5.1 Changes in Unit Values Over Time

As previously discussed, AVEs for specific tariffs could increase or decrease over time even if the tariff commitments are unchanged because of changes to unit values. For example, higher unit values due to inflation would lead to smaller AVEs, all else equal. To explore the impact of unit value changes, we check whether replacing the Geneva AVEs at 1947 unit values with AVEs that hold unit values constant using 1933 unit values impacts our results.

In addition to Geneva AVEs calculated with 1947 unit values, Table 6 includes summary statistics when holding unit values constant at 1933 unit values.[37] The mean Geneva AVE tariff increases to 24.62 percent, up from 19.46 percent when using 1947 unit values, but is still well below the mean Smoot-Hawley tariff of 37.91 percent. This suggests that AVEs using time-varying unit values may overstate the negotiated tariff decreases between Smoot-Hawley and the Geneva round. However, if policymakers are actively aware of the changes in unit values—through inflation or deflation in the economy—and account for this when negotiating specific tariffs, then the calculated AVEs with time-varying unit values could be the tariff measure of interest in trade policy negotiations. We do not take a stance on whether holding unit values is preferred; instead, we present a robustness check that holds unit values constant.

To provide insights into the implications of changes in unit values, Figure 3 plots the relationship between Geneva and Smoot-Hawley AVEs (the solid blue circles) and this same relationship when holding unit values constant at 1933 unit values (the black empty circles). Most striking is that there is more variation in the Geneva AVEs using time-varying unit values. This is expected given that changes in these AVEs from Smoot-Hawley to Geneva encompass both unit value changes that impact AVEs for specific tariffs and changes in the tariff commitments. In contrast, when holding unit values constant, AVEs only include changes in the tariff commitments. Points along the 45-degree line are products with Smoot-Hawley AVEs equal to Geneva AVEs, with points below (above) this line representing tariff decreases (increases) over the time period. While tariff increases between Smoot-Hawley and Geneva are rare, 95 products have Geneva AVEs that are larger than the Smoot-Hawley AVEs when using time-varying unit values, and only 21 products have Geneva AVEs larger than Smoot-Hawley AVEs when using 1933 unit values.[38]

Table 8 includes the regression results when the dependent variable in Equation 3 is the

[37] AVEs that hold unit values constant are labeled with "(1933 Unit Values)" in Table 6.

[38] See Section 4.4 above for details.

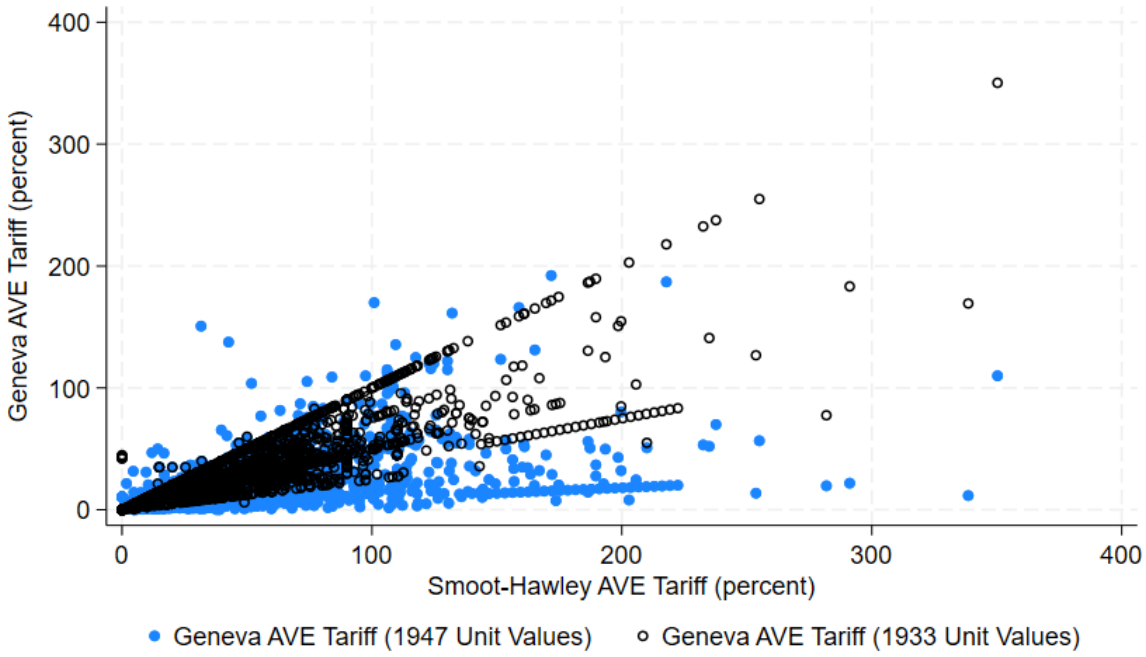

Figure 3: Time-varying Unit Values Versus Constant 1933 Unit Values

Notes: For ease of presentation, this figure omits one product with a Smoot-Hawley AVE above 400 percent. Geneva AVE tariffs differ in the unit values (from either the year 1947 or 1933) used to calculate AVEs for observations that include specific tariffs. Smoot-Hawley AVE tariffs use 1933 unit values.

Geneva AVE tariff that uses 1933 unit values. Across the columns, the coefficient estimates on the Smoot-Hawley tariffs are larger than in Table 7. In contrast, the magnitude of the point estimates on the level, log, and binary import value variables are smaller, but continue to provide negative estimates that are consistent with the terms-of-trade motive. Only the level import value estimate in column 1 is insignificant; however, the log and binary import variables continue to be statistically significant for OLS estimation, and all three functional forms with the Tobit results are significant. Overall, the estimates suggest that while the changes in unit values impact the magnitude of the estimated effect, holding unit values constant yields regression estimates that are also consistent with the terms-of-trade theory predictions.

Table 8: Robustness Check, Holding Unit Values Constant at 1933 Levels

Dependent Variable: Geneva AVE Tariff (1933 Unit Values)						
	OLS			Tobit		
	(1)	(2)	(3)	(4)	(5)	(6)
Smoot-Hawley AVE Tariff	0.641***	0.665***	0.641***	0.697***	0.714***	0.696***
	(0.018)	(0.019)	(0.018)	(0.007)	(0.008)	(0.007)
1933 Import Value	-0.049			-1.251***		
	(0.048)			(0.286)		
Log 1933 Import Value		-0.145*			-0.367***	
		(0.083)			(0.094)	
High 1933 Import Value			-0.652*			-1.262***
			(0.381)			(0.464)
Observations	4,332	3,684	4,332	4,332	3,684	4,332
R-squared	0.791	0.812	0.791			
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Standard errors in parentheses (OLS are heteroskedasticity-robust). The log of 1933 import values drops observations that have an import value of zero. The Tobit model specifies zero as a lower limit of the dependent variable. Smoot-Hawley AVE tariffs use 1933 unit values to calculate AVEs for observations that include specific tariffs. Singleton observations are dropped. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

5.5.2 Bilateral Trade Agreements

As discussed in Section 2, reductions in U.S. MFN tariffs between 1930 and 1947 come from both the Geneva negotiations and a series of bilateral trade agreements. The tariff commitments from all these trade agreements were extended on an MFN basis by the U.S. This implies that observed Geneva round tariffs capture tariff changes not only from GATT negotiations but also tariff changes from previous bilateral trade agreements.[39]

From one point of view, applying bilateral trade agreement tariffs on an MFN basis is not entirely consistent with the terms-of-trade theory since the U.S. is only exchanging tariff concessions with trade agreement partners but extending those tariff concessions multilaterally.[40]

[39] Tariff changes prior to GATT also include changes due to other, non-trade agreement provisions, a point we return to in a later robustness check.

[40] One limitation of our data is we are not able to observe whether other non-member countries were also reducing their tariffs as the U.S. was signing these trade agreements.

At the same time, these bilateral negotiations—although not taking place simultaneously—were linked together in a way that is similar to those in the GATT through the extension of MFN. In addition, having trade liberalization prior to GATT is helpful to our empirical approach as it supports that the U.S. was making a significant shift from a non-cooperative to cooperative tariff setting—which would probably be less likely to occur if there was only one opportunity for trade negotiations.

Since Geneva-round tariffs in 1947 encompass a series of negotiations over many years, we present two robustness checks in Table 9 that disentangle the tariff changes from the bilateral trade agreements from the tariff changes in the Geneva round. First, we substitute 1946 AVE tariffs as the dependent variable in Equation 3. 1946 is the last year before the GATT, and it includes all the bilateral tariff changes that occurred between Smoot-Hawley and 1946. The summary statistics in Table 6 include the 1946 AVEs (labeled "AVE Tariff Prior to Geneva (1946 Unit Values)") and the mean tariff is about 25 percent. This suggests that the U.S. tariff changes prior to GATT account for about 70 percent of the average tariff change between Smoot-Hawley and the Geneva round.[41]

The regression results with the 1946 AVE dependent variable are in Panel A of Table 9. The estimates on the Smoot-Hawley tariffs have the predicted positive and significant estimates that are slightly larger than the baseline results in Table 7. For each import value variable, the coefficient estimates continue to be negative and are significant in all six columns for the OLS and Tobit models. Thus, this suggests the tariff changes prior to GATT are also consistent with the terms-of-trade theory predictions on their own.

Finding support for the terms-of-trade motive when focusing on tariff changes due to the bilateral trade agreements raises the following question: were the U.S. tariff changes from Smoot-Hawley to Geneva driven only by these bilateral trade agreements? To further explore this and as an alternative robustness check, we return to our baseline empirical approach that uses Geneva AVE tariffs as the dependent variable, but instead use the subsample of observations that did not experience any tariff changes between Smoot-Hawley and 1946.[42] The regression results are in Panel B of Table 9. The number of observations decreases to 2,687 for the specifications that use the level of imports or the binary transformation; the number of observations decreases further to 2,298 when using log imports. Across the six columns, the import value estimates continue to be negative and statistically significant. Taken together with the 1946 tariff results (Panel A), this provides strong evidence that

[41] $(37.91 - 25.01)/(37.91 - 19.46) = 0.6992$.

[42] The subsample is determined by selecting observations that have the same Smoot-Hawley tariff and 1946 MFN tariff in the 1946 Schedule A (i.e., products that have the same AVEs in both years when holding unit values constant at 1933 levels).

the terms-of-trade consistent results are driven both by bilateral negotiations and GATT negotiations.

5.5.3 Other Provisions Impacting Tariffs

In addition to the bilateral trade agreements, a subset of products where subject to quotas and other unilateral actions impacting U.S. tariffs prior to the GATT. Appendix 8.3.4 provides descriptions of the five categories of U.S. legislative provisions that occur in the data, ranging from tariffs set under Section 336 of the Tariff Act of 1930 to those under the Sugar Act. Table 10 drops products that were subject to quotas or any of these provisions to explore if the empirical results are sensitive to these cases. Even with the decrease in sample size (e.g., from 4,332 to 3,997 observations in column 1), the coefficient estimates for Smoot-Hawley tariffs and the import value variables are similar in magnitude and statistical significance as the baseline results in Table 7.[43]

[43] As an alternative, we use the baseline sample and include a dummy variable as a control variable that indicates if the product was subject to any quota or other provision. The coefficient estimates for Smoot-Hawley tariffs and the import value variables continue to be similar to the baseline results in Table 7. The estimates on the dummy control variable are statistically insignificant at the 10 percent level. Results are available upon request.

Table 9: Robustness Check, Impact of Pre-GATT Bilateral Trade Agreements

Panel A: Pre-GATT Tariff Changes

Dependent Variable: AVE Tariff Prior to Geneva (1946 Unit Values)	OLS			Tobit		
	(1)	(2)	(3)	(4)	(5)	(6)
Smoot-Hawley AVE Tariff	0.368***	0.343***	0.368***	0.428***	0.397***	0.428***
	(0.029)	(0.032)	(0.029)	(0.010)	(0.011)	(0.010)
1933 Import Value	-0.251***			-1.896***		
	(0.086)			(0.364)		
Log 1933 Import Value		-0.580***			-0.834***	
		(0.119)			(0.125)	
High 1933 Import Value			-2.344***			-3.112***
			(0.485)			(0.598)
Observations	4,191	3,548	4,191	4,191	3,548	4,191
R-squared	0.588	0.581	0.590			
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Products without Tariff Changes Prior to GATT

Dependent Variable: Geneva AVE Tariff (1947 Unit Values)	OLS			Tobit		
	(1)	(2)	(3)	(4)	(5)	(6)
Smoot-Hawley AVE Tariff	0.392***	0.359***	0.392***	0.476***	0.432***	0.479***
	(0.028)	(0.028)	(0.028)	(0.012)	(0.012)	(0.012)
1933 Import Value	-0.158***			-1.962***		
	(0.043)			(0.507)		
Log 1933 Import Value		-0.460***			-0.920***	
		(0.110)			(0.148)	
High 1933 Import Value			-2.441***			-4.121***
			(0.506)			(0.728)
Observations	2,687	2,298	2,687	2,687	2,298	2,687
R-squared	0.657	0.652	0.659			
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Notes (both panels): Standard errors in parentheses (OLS are heteroskedasticity-robust). The log of 1933 import values drops observations that have an import value of zero. The Tobit model specifies zero as a lower limit of the dependent variable. Smoot-Hawley AVE tariffs use 1933 unit values to calculate AVEs for observations that include specific tariffs. Singleton observations are dropped. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 10: Robustness Check, Drop Products with Quotas or Other Unilateral Provisions

Dependent Variable: Geneva AVE Tariff (1947 Unit Values)						
	OLS			Tobit		
	(1)	(2)	(3)	(4)	(5)	(6)
Smoot-Hawley AVE Tariff	0.324***	0.295***	0.324***	0.381***	0.344***	0.382***
	(0.029)	(0.030)	(0.029)	(0.009)	(0.009)	(0.009)
1933 Import Value	-0.195***			-1.082***		
	(0.042)			(0.349)		
Log 1933 Import Value		-0.370***			-0.586***	
		(0.098)			(0.113)	
High 1933 Import Value			-1.651***			-2.319***
			(0.429)			(0.537)
Observations	3,997	3,406	3,997	3,997	3,406	3,997
R-squared	0.559	0.552	0.560			
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Standard errors in parentheses (OLS are heteroskedasticity-robust). The log of 1933 import values drops observations that have an import value of zero. The Tobit model specifies zero as a lower limit of the dependent variable. Smoot-Hawley AVE tariffs use 1933 unit values to calculate AVEs for observations that include specific tariffs. Singleton observations are dropped. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

5.5.4 Caps on Negotiated Tariff Changes

Under the RTAA, tariff decreases in bilateral trade agreements occurring between Smoot-Hawley and 1946—the year prior to GATT—were generally capped at 50 percent. Between 1946 and the first GATT round in 1947, U.S. trade negotiators received additional negotiating authority to reduce tariffs by up to another 50 percent from the 1946 levels, which had the potential to limit the magnitude of tariff liberalization over the period. Indeed, about one-fifth of products experience a tariff decrease of at least 50 percent in either the pre-Geneva period or during the Geneva-round negotiations.[44]

[44]Using AVEs that use 1933 unit values, between Smoot-Hawley and 1946, 577 products had a 50 percent decrease in the tariff rate and 32 products has a tariff decrease larger in magnitude than 50 percent. These 32 products were subject to at least one provision covered in Section 5.5.3. Between 1946 and 1947, 766 products had a 50 percent decrease in the tariff rate and 2 products had a tariff decrease larger in magnitude than 50. These 2 products were not subject to other provisions.

It is, therefore, important to test whether our empirical results are robust to taking this institutional feature into account. We do this by considering a sample that drops products that experienced at least a 50 percent decrease in either of the two periods (Smoot-Hawley to 1946, or 1946 to the Geneva round). Table 11 shows that the regression results using this sample are similar to the baseline results in Table 7. The import value coefficient estimates continue to be negative and significant.

Table 11: Robustness Check, Drop Observations with Tariff Decreases of at Least 50 percent

Dependent Variable: Geneva AVE Tariff (1947 Unit Values)						
	OLS			Tobit		
	(1)	(2)	(3)	(4)	(5)	(6)
Smoot-Hawley AVE Tariff	0.316***	0.301***	0.316***	0.375***	0.354***	0.375***
	(0.028)	(0.032)	(0.028)	(0.009)	(0.010)	(0.009)
1933 Import Value	-0.233***			-1.763***		
	(0.063)			(0.359)		
Log 1933 Import Value		-0.499***			-0.815***	
		(0.104)			(0.129)	
High 1933 Import Value			-2.499***			-3.598***
			(0.472)			(0.631)
Observations	3,406	2,904	3,406	3,406	2,904	3,406
R-squared	0.583	0.583	0.585			
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Standard errors in parentheses (OLS are heteroskedasticity-robust). The log of 1933 import values drops observations that have an import value of zero. The Tobit model specifies zero as a lower limit of the dependent variable. Smoot-Hawley AVE tariffs use 1933 unit values to calculate AVEs for observations that include specific tariffs. Singleton observations are dropped. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

6 Conclusion

This paper provides a detailed study of U.S. trade policy from the Smoot-Hawley Tariffs of 1930 through the first GATT round in 1947. We compile and concord a new product-level dataset on U.S. tariffs and imports. Given the prevalence of specific tariff rates over this period, we calculate AVEs that allow for straightforward comparisons across different types

of tariffs. Another contribution of this paper is making the data available to help advance future academic research and public policy. Given the recent return to broad-based import protection policies around the world, understanding the historical dynamics behind U.S. trade liberalization is more important than ever.

Taking a first look into the data, we uncover interesting patterns in historical U.S. tariff commitments across industries and over time. We also extend the empirical approach from Bagwell and Staiger (2011) to provide an empirical assessment of predictions from the terms-of-trade theory in an ideal setting for a large, developed economy. The estimation results indicate that tariffs negotiated in trade agreements are, on average, lower when non-cooperative imports are larger, conditional on the level of non-cooperative tariffs. Some avenues for future research are to further explore the terms-of-trade theory in the context of other developed economies and to further study the motivations for U.S. trade liberalization in this era as well as its impacts.

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8 Data Appendix

8.1 Data Overview

Our data set incorporates two industry classification systems pertaining to imports into the U.S. during the Smoot-Hawley period. The first is the Smoot-Hawley paragraph number system, under which import duties were set. The second is the Schedule A system, which covers import duties, volume, and quantity data described at a more refined product level. The data for both systems were collected from the sources in Table 12[45] and merged using concordance tables, thereby constructing the final data set. While the empirical analysis presented in this paper primarily relies on the Schedule A system, the data set can be sorted or linked to other data that employs either the Schedule A system or the Smoot-Hawley paragraph number system.

8.1.1 The Schedule A System

Information pertaining to the Schedule A system is principally derived from the U.S. Department of Commerce annual report, entitled "Schedule A, Statistical Classification of Imports into the United States." The document was published for nonconsecutive years (e.g., in 1933 but not in 1934 or 1935, and then again in 1936 and 1937). Although the HathiTrust digital library contains a substantial number of Schedule A reports from 1930 to 1946. its collection is not comprehensive. Consequently, we also utilized the interlibrary loan system through the Syracuse University library to obtain and digitize the remaining reports. We verify and extend these sources with the import records from the Department of Commerce and the texts of the bilateral trade agreements, which are listed in the last three rows of Table 12.

In Schedule A, the industrial classification of products are classified as eleven groups, which we present in Table 13. The groups are further divided into subgroups that define the products classification at a more disaggregated level. For example, in "Group 4: Wood and Paper," there are six subgroups: "Wood, unmanufactured," "Sawmill products (lumber)," "Wood manufactures," "Cork and manufactures," "Paper base stocks," and "Paper and manufactures." Altogether, there are 93 subgroups under the 11 groups. We use the 93 subgroup definitions in the 1950 Schedule A—after verifying the group definitions are the same in the 1946 Schedule A—as industry-level fixed effects for the terms-of-trade analysis.

[45] In the Supplementary Online Appendix, we provide detailed information of the digitization and merging process for these various documents.

Table 12: Summary of Data Sources

Document	Content	Years	Sources
Consolidated Schedules of Tariff Concession	Consolidated Schedule of Geneva, Annecy and Torquay	1952	United Nations Publications. International Documents Service, Columbia University Press
United Nations Treaty Collections (UNTC)	Individual negotiated agreements in GATT in terms of the Smoot-Hawley Paragraph Number	1947 (Geneva), 1948 (Annecy), 1950 (Torquay)	UNTC official website
The United States Senate Library series	The Smoot-Hawley Act in 1930	1930	Federal Register
Statistical Classification of Imports into the United States	Executive tariff rates implemented by the U.S. government in terms of the Schedule A code.	1930, 1933, 1936, 1937, 1939, 1941, 1943, 1946, 1950	U.S. Department of Commerce, Bureau of the Census
Agreement between the United States and —- respecting reciprocal trade	Full text of each bilateral trade agreement, including schedules of concessions	1935–1939, 1942-1944	Federal Register
The Foreign Commerce and Navigation of the United States	Imports of products into the U.S. documented in terms of the Schedule A code	1933, 1935, 1946	U.S. Department of Commerce, Bureau of the Census
United States Imports for Consumption of Merchandise	Imports of products into the U.S. documented in terms of the Schedule A code	1947	U.S. Department of Commerce, Bureau of the Census

8.1.2 The Smoot-Hawley Paragraph Number System

We collect the tariff data based on the Smoot-Hawley paragraph number system from the original copy of the Smoot-Hawley Act in 1930 and the United Nations Treaty Collection (UNTC), which contains the consolidated tariff schedule for each participating country and

Table 13: Schedule A Codes: Groups

Schedule	Category	Schedule A Code
00	Animals and Animal Products, Edible	0010600-0097500
0	Animals and Animal Products, Inedible	0201000-0990290
1	Vegetable Food Products and Beverages	1020000-1900000
2	Vegetable Products, Inedible, Except Fibers and Wood	2011000-2960150
3	Textile Fibers and Manufactures	3001000-3981100
4	Wood and Paper	4007100-4799990
5	Nonmetallic Minerals	5000000-5958100
6	Metal and Manufactures Except Machinery and Vehicles	6001000-6900500
7	Machinery and Vehicles	7063000-7940290
8	Chemicals and Related Products	8000000-8731200
9	Miscellaneous	9001000-9990750

each GATT round. We initially collated and digitized the tariff schedules for the Geneva, Annecy, and Torquay rounds for the United States, but in this paper we are only using the Geneva 1947 tariff schedule.

We referenced the Smoot-Hawley Act whenever necessary to concord between 1930 and 1947 and to infer which products were subject to non-trade-agreement provisions.[46]

The U.S. bilateral trade agreements with other countries also played an important role in the liberalization of trade prior to the GATT. The Office of the Historian website maintained by the U.S. Department of State collects all the related information of negotiations/correspondence between the two nations for each agreement. We sourced the texts of the bilateral trade agreements from the Federal Register as compiled in the United States Statutes at Large. These texts include full product detail on the tariffs negotiated in each bilateral agreement.

8.2 Concordance

8.2.1 Concordance Between Schedule A and Smooth-Hawley

After digitizing the above documents, we concord the resulting data sets to create our data set. The initial step is to create a concordance between the Schedule A Codes and Smoot-Hawley Paragraph Numbers. This is achieved by manually entering the paragraph numbers for each Schedule A code from the 1946 Schedule A. A considerable number of Schedule A

[46] See Section 8.3.4 below for details.

products often share the same Paragraph Number; in contrast, Schedule A codes virtually always maintain a one-to-one correspondence with the import records. To facilitate the sorting of products within a Smoot-Hawley paragraph, we assign a unique item number to each Schedule A tariff (for mixed tariffs, we enter one observation in our raw data for each element of the tariff).

A few Schedule A codes are associated with multiple paragraph numbers. In most such instances, the multiple paragraph numbers encompass a principal product description and relevant supplementary provisions, such as additional duties on a particular material the product is made of. We assign the paragraph number in these instances by manually comparing the text of the Smoot-Hawley paragraphs to find the paragraph number that is most important in classifying the product. This means that we can sort products based on the degree of similarity in their descriptions. In a few instances where the descriptions are too ambiguous to determine the primary paragraph number, we use the first paragraph number documented in the original government schedules. This item number system enables the sorting of the data and the potential merging with other data sets that employ the Schedule A or Smoot-Hawley systems.

8.2.2 Concording Schedule A Over Time

This subsection describes the methodology employed in the Schedule A concordance table spanning from 1933 to 1946, and 1946 to 1948.

The initial step in concording is to select the benchmark year, as the concordance can be constructed in two directions: from the latter year to the former year or from the former year to the latter year. The selection of a benchmark year faces a trade-off that later schedules tend to have more lines and a more organized structure, since new codes with more specific classifications are added over time as tariff negotiations insert more nuance into the U.S. tariff schedules. However, these new lines were not negotiated separately in previous agreements and hence did not have separate import records in earlier years.

Since the primary objective of this study is to examine the formation and impact of the inaugural round of GATT (Geneva 1947), we decided to use 1946, just before the Geneva round, as our benchmark for the construction of the concordance. Using 1946 as the benchmark year provides the most comprehensive pre-Geneva rates schedule, which encompasses all bilateral agreements up to the first GATT round. It also allows us to cleanly use the 1947 import data to calculate unit values for the Geneva round, as 1947 imports are enumerated using the 1946 Schedule A codes. This is true for exactly the same reason that we selected

1947 as the unit value year: they were collected before the Geneva round tariffs took effect. This means that the Schedule A code changes that were necessitated by the Geneva tariff commitments had not yet taken effect in 1947.

A prerequisite for constructing these concordances is ensuring that all Schedule A codes adhere to a uniform format. Since our Schedule A code identifiers use the more standardized 7-digit codes of 1946, we developed an algorithm to extend the 5-digit Schedule A code in 1933 to the 7-digit codes in 1946 and 1948. This mostly involves adding zeros and moving the location of the decimal point.

The Schedule A product list has undergone numerous substantive modifications over time, including alterations to its syntax and provisions, which creates a significant challenge in creating a comprehensive panel data set. In addition to the modifications to the Schedule A codes, another challenge is the mapping relationship between products over time. In practice, cases are classified as 1-to-1, M-to-1 (one or multiple old codes merge into one new code), 1-to-N (one old code splits into one or multiple new codes), or M-to-N (one or multiple old codes are mapped to one or multiple new codes). Some new products are added to the Schedule A, while some older products are also removed.

After setting the benchmark year, we consider five elements when connecting product codes across schedules in different years: the Schedule A number, unit of quantity, tariff rate, Smoot-Hawley paragraph number, and product description. We classify the matches into seven types, and describe them in terms of the 1933 to 1946 concordance.

Default: a product's schedule A code is unchanged and the description is substantively the same through the period.

Split: a product in the 1933 Schedule A was split into multiple products in the 1946 Schedule A.

Merge: multiple products in the 1933 Schedule A were merged into a single product in the 1946 Schedule A.

New: a new product that does not appear in the 1933 Schedule A was created.

Obsolete: a product in the 1933 Schedule A was not provided for in the 1946 Schedule A.

Reassign: a product with the same substantive description as in the 193 Schedule A was assigned a new code in the 1946 Schedule A.

Mixed: an M-N match that does not fit one of the other types. This type of mapping is not frequent in the sample, and is usually accompanied by a change in the logic of the chapter and rephrasing of the descriptions.

Assigning a concordance type to each match offers several benefits: it provides a comprehensive view of the expanding range of products in the Schedule A and is essential for linking the Schedule A tariff data with import data to calculate AVEs. We made these assignments for 1933 to 1946 and for 1946 to 1948.

8.3 Notable Data Details

8.3.1 Free List

Many of the duty-free products in Schedule 16 of Smoot-Hawley remained unconstrained by trade commitments for many years. While the U.S. unilaterally set the Smoot-Hawley tariffs and could have increased them at any time, the only cases we found of a Free-list product receiving a strictly positive tariff up to 1947 are for a handful of sugar products whose tariffs were increased under the Sugar Act (see Section 8.3.4 below for details). In contrast, we observe hundreds of cases where Smoot-Hawley duty-free rates became bound during bilateral trade agreements or the GATT. We denote Smoot-Hawley Free-list products with a "0" for the ad valorem tariff.

Under the Smoot-Hawley paragraph number classification system, duty-free items were gathered into Schedule 16 instead of integrated into a schedule with similar products. We have integrated these duty-free items into our data and organized by Schedule A so that all like products appear together.

8.3.2 Mixed Tariffs

We classify a product as having a mixed tariff when that product has a minimum or maximum tariff in addition to the usual ad valorem or specific tariff. For example, Schedule A code 5380550 in the 1950 Schedule A (Paragraph Number 202a) *Earthen tiles: Quarries or quarry tiles: Valued not over 40 cents per square foot and more than 5/8 inch in thickness* has a Smoot-Hawley rate of 10 cents per square foot, and the minimum ad valorem rate of 50 percent and the maximum ad valorem of 70 percent. In the bilateral agreement with the United Kingdom, the rates for this product were reduced to 5 cents per square foot, the minimum ad valorem rate of 25 percent, and the maximum ad valorem rate of 70 percent. After the Geneva round, the tariff rates for this line were further reduced to 5 cents per square foot, the minimum ad valorem rate of 15 percent, and the maximum ad valorem rate of 70 percent. When merging this tariff schedule with the import data, we take account of

these cases by using the AVEs for any specific portion of the tariff specification to determine the applied tariff and only enter the applied tariff in the final data.

8.3.3 Line Splitting

Line splitting is usually associated with the introduction of new product distinctions. Typically, new lines are created when negotiators agree to heterogeneous tariff reductions within what was previously one Schedule A code. For example, the product *"Prepared or preserved: Birds, including poultry, prepared or preserved, n.s.p.f."* was assigned the Schedule A code 0026000 in the 1946 Schedule A with a rate of 10 cents per pound. Because of the Geneva round negotiations, the 1950 Schedule A saw a division into two distinct lines: (i) *"Turkeys, prepared or preserved,"* with code 0026500 and rate of 5 cents per pound; (ii) *"Prepared or preserved: Birds, including poultry, prepared or preserved, n.s.p.f."* with code 0026900 and a rate of 10 cents per pound. In this case, the splitting occurs because a more specific product (turkey) within a broader category (poultry) was negotiated separately while other products under this category remained unchanged. To deal with these kinds of changes to the Schedule A, we have two lines in our data with identical 1946 Schedule A codes, Smoot-Hawley tariff rates, and pre-Geneva tariff rates, but different tariff rates for the Geneva round.

We must take account of Schedule A code changes when calculating the AVEs for a given year. This is because we use previous-year import data in calculating AVEs to avoid having the tariff changes impact the unit values. Since we cannot separate the quantities and values in the previous-year import data for lines that split, we apply the unit value for the previous, un-split Schedule A number to each new Schedule A code that was split out from the original.

8.3.4 Unilateral Actions Impacting U.S. Tariffs

The provisions listed below cover five classes of tariff changes that were primarily made by unilateral U.S. policy. We detect which products were subject to these provisions in the Schedule A column "1930 Tariff Act (except as noted)," where the notes indicate any provision which makes the statutory tariff different from the Smoot-Hawley level. Products that are subject to these provisions have non-cooperative rates (the current 'Column 2' rates) different from the original Smoot-Hawley rates.

Section 336: Section 336 is also known as the flexible tariff provision. It was created to give the President of the United States authority to unilaterally change individual import

duties, that is, to increase or decrease tariffs by up to 50 percent. Our data shows 181 products impacted by Section 336 changes.

Sugar Act: The goal of the Sugar Act was to control sugar imports into the U.S. and stabilize the sugar sector. The Sugar Act offered short-term solutions to control the sugar market and preserve price stability, and included establishing quotas and tariffs on sugar. We see several revisions to the Sugar Act during our time period, with 80 products affected.

Internal Revenue Code (IRC): The IRC serves as the comprehensive body of law that consolidates all federal tax statutes, covering a wide range of taxes such as income tax, estate tax, gift tax, excise tax, alcohol tax, tobacco tax, and employment tax. Before the IRC's existence, U.S. tax laws were published in separate volumes based on subject matter. The Internal Revenue Code went into effect in 1939, but internal tax provisions were applied to imports in the years before the code was consolidated. We refer to all such taxes as IRC provisions. IRC rates were added to the tariff for all products with a domestic excise tax to ensure foreign producers did not escape the excise tax and gain an advantage over domestic producers. IRC rates were sometimes included in bilateral negotiations. There are 286 products in our data that were impacted by internal tax provisions.

Emergencies: Section 318 of the Tariff Act of 1930 granted authority to the President, the Secretary of the Treasury, and the Commissioner of U.S. Customs and Border Protection to change tariffs during a state of emergency. When the President declares an emergency due to war or other reasons, they can authorize the Secretary of the Treasury to extend the time allotted for certain activities and allow duty-free importation of essential supplies for emergency relief work. The Secretary of the Treasury was required to report to Congress about any actions taken under this provision.[47] There are 5 products in our data that had emergency tariffs at some point.

The American Selling Price: This provision allowed the tariff to be calculated based on domestic prices instead of the price charged by foreign exports on some products. It was used primarily for chemical products. The American Selling Price was applied to 42 products in our dataset.

[47] See https://uscode.house.gov/view.xhtml?req=granuleid:USC-prelim-title19-section1318&num=0&edition=prelim.