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

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Abstract

The major trade liberalization "event" of the twentieth century was the tariff reductions within the framework of the General Agreement on Tariffs and Trade (GATT). Somewhat surprisingly, data on the tariff commitments made by the GATT contracting parties has not been widely available, preventing detailed empirical studies on the workings of the GATT. What may be even more surprising to many is that multilateral trade liberalization by the United States actually began in 1934 with a series of more than two dozen bilateral trade agreements whose commitments were extended to all trading partners. This paper studies this crucial period of trade liberalization, including the creation of a new dataset covering detailed product-level U.S. tariffs from the Smoot-Hawley Tariff Act of 1930 through the first GATT round in 1947. Using this novel dataset, we summarize this dynamic period in U.S. trade policy and use the data to test the terms-of-trade theory in the ideal setting of a large country moving from unilateral non-cooperative tariff setting to cooperative tariff setting. We find empirical evidence that changes in U.S. tariffs over this period are consistent with predictions from the terms-of-trade theory.

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

*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.

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

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 important 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 and uses that data to provide the first test of the terms-of-trade theory for a developed country that is large in terms of its market power as an importer.

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 too high from the point of view of the country's welfare and trade agreements lead to lower, more efficient tariff levels. While the theoretical literature has received much attention that dates back to at least Johnson (1953), there is less research providing empirical evidence of the terms-of-trade theory (e.g., 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; Jestrab 2024).

One reason that empirical evidence is limited is that the terms-of-trade theory is applicable 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 detailed, 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.[2] 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 predominantly small and developing economies. These samples are not ideal for testing the terms-of-trade theory since developing economies usual hold less importer market power than large, developed economies.

This paper overcomes the challenge of historical data availability and provides evidence that U.S. tariff changes in the first GATT round in 1947 are consistent with predictions from the terms-of-trade theory. In particular, there are two main contributions of this paper. The first contribution is with respect to data collection. We have located, digitized, and concorded the U.S. tariff schedules that include the universe of products, negotiated or imported, from

[2]More recently, Bagwell, Staiger, and Yurukoglu (2020) digitize the bilateral negotiation records for the Torquay Round. Acosta and Cox (2022) compile cross sections of U.S. tariff commitments, and Greenland, Lake, and Lopresti (2023) use product-level data for the Tokyo Round.

the Smoot-Hawley Tariff Act in 1930 to the first GATT round in 1947. This data provides detailed time series information for each product including whether they are included in bilateral agreements or changed by unilateral actions outside of trade agreement negotiations. We also merge in detailed U.S. import data for select years, and build concordances that allow us to track the tariff level and import value at the 7-digit Schedule A product level from 1930–1947.[3]

This new panel data set allows us to 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 analyze specific (i.e., per quantity) tariffs and ad valorem (as a percentage of value) tariffs separately, but our focus is on analyses that combine both types of tariffs using ad valorem equivalents (AVEs). We provide evidence that ignoring specific tariffs or tariffs with specific components (i.e., compound and mixed tariffs) is not advisable during this period, as only about 38 percent of products have only a non-zero ad valorem tariff (about 15 percent more are free, and can be characterized as having a zero ad valorem tariff). Importantly, considering only the ad valorem component of more complex tariff forms introduces mismeasurement, and these forms make up nearly 20 percent of the data.

We confirm that U.S. tariffs had relatively large decreases between Smoot-Hawley and the first GATT round for many products. Somewhat surprisingly, we find that the bilateral trade agreements flowing out of the Reciprocal Trade Agreements Act (RTAA) of 1934 made an important contribution to the amount of U.S. trade liberalization that was achieved between 1930 and 1947. The U.S. was active in negotiating these bilateral trade agreements prior to GATT and concessions from these bilateral agreements were generally extended on a most-favored-nation (MFN) basis.

There is 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 since 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 generally less common in modern U.S. tariffs.

Our second contribution is using this novel dataset to contribute to the empirical terms-of-trade literature. 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 a unilateral tariff under Smoot-Hawley to

[3]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 HS-6 digit level. Throughout this paper we refer to a Schedule A number as a product or item.

setting trade policy cooperatively with both bilateral agreements that are extended as MFN commitments and the multilateral GATT agreement. Overall, we provide empirical evidence that is 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). In particular, we find that conditional on the Smoot-Hawley tariffs and industry fixed effects, Geneva tariffs are lower when the U.S. imports more of the product. The baseline OLS estimates imply a one standard deviation increase in 1933 U.S. import values correspond with a 2.7 percent decrease in the average GATT tariff. We show this relationship is generally robust to a series of alternative specifications, such using a Tobit model to address zero tariffs, accounting for changes in unit values over time that impact AVEs, and separating trade liberalization through bilateral trade agreements versus the GATT.

Our work is related to several branches of literature. There is a large qualitative literature on the history of U.S. trade policy and the GATT. Irwin (2017) provides a comprehensive 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 went into effect. 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) that has 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 over 1995–2005 considered by Bagwell and Staiger (2011). Another related study is Irwin and Soderbery (2021) who examine U.S. tariffs around Smoot-Hawley. However, different from 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 the Smoot Hawley tariff. Mitchener, O'Rourke, and Wandschneider (2022) study how Smoot-Hawley affected U.S. exports. Acosta and Cox (2022) 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, along with with 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).[4] This section provides a brief historical background of U.S. trade policy between 1930 and 1947.

2.1 The Smoot-Hawley Tariffs of 1930 and 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 the large and general unilateral upward revision of the U.S. tariff schedule in the Tariff Act of 1930, known as the Smoot-Hawley Act.

[4]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.

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 as well as 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).[5] 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. With the RTAA's delegation of tariff setting powers to the president, the Smoot-Hawley Act was Congress's last general revision to 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. Their purpose was to reduce or eliminate 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 import items 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 1939. All commitments except those with Cuba were extended as MFN tariffs. 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. Czechoslovakia and Cuba, however, are excluded from our data, as previously discusssed. This means that there were fourteen contracting parties to the GATT that did not have a bilateral trade agreement with the U.S.: Australia, Burma, Ceylon, Chile, China, India, Lebanon,

[5] 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.

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	

The trade agreement with Nicaragua was enacted on Oct. 1, 1936 and terminated on March 10, 1938. The trade agreement with Czechoslovakia was enacted on Apr. 15, 1938 and terminated on April 22, 1939. We exclude these countries from our analysis along with Cuba since commitments to Cuba were not extended as MFN tariff commitments.

2.3 The First GATT Round: Geneva 1947

The U.S. was arguably the driving force behind the GATT, and it was responding to events both at home and on the world stage. 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—somewhat surprisingly in retrospect—the unconditional MFN principle would be applied to any tariff concession so that it was auto-

matically and freely extended to all other suppliers, with the exception of a few communist countries (Dobson 1976).

By the mid 1940's, the U.S. had already made the general maximum allowable reduction—50 percent—under the RTAA 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 in the midst of World War II.

With this negotiating authority in hand, President Truman's administration instigated multilateral 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, and thus instead of members it had "contracting parties" (Irwin 2017).

The negotiations in Geneva were multilateral in principle, but in fact the way they were carried out was similar to the way 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 a MFN basis.[6] These schedules were annexed to the GATT.

3 Historical U.S. Data

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

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

3.1 Data sources

3.1.1 Tariff Commitment Data

The GATT tariff schedule data is collected from the United Nation Treaty Collection (UNTC) website, which offers the detailed tariff schedule of every country of each round of GATT negotiation from the first round of Geneva to the Uruguay Round.[7] From this source, we collect 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 jus before the Geneva round of the GATT. The 1946 tariffs were compiled by the forerunner to the USITC in order 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 Trade Act of 1930, which has 966 paragraphs, where many paragraphs cover multiple items with different tariff rates.[8] The number of distinct tariff rates within paragraphs grows over time as tariff commitments are often made in such a way that items that previously shared a tariff see their tariff rates diverge. As new negotiations take place, products that were previously listed as one item—and thus had a single tariff rate—are often split into multiple items with different tariff rates.[9] 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 the import classification system, known as "Schedule A," is not a perfectly hierarchical system, 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 Schedule A evolves over time, we have generally organized the tariff data using the 1946–1947 version of the Schedule A.[10] We chose 1946 because these tariffs are crucial in quantifying the tariff reductions in the Geneva 1947 round of GATT negotia-

[7] 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.

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

[9] See Acosta and Cox (2022) for in-depth examples.

[10] 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.

tions. 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 1944–1945.

3.1.2 Import Data

We also require U.S. import data to create AVEs for both descriptive statistics and the terms-of-trade analysis. We have acquired complete import data—including exporter detail—for 1935–1938 and 1947.[11] We also manually gathered total import quantities and values for 1933 and for 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 the Department of Commerce publication *Foreign Commerce and Navigation of the United States* for each calendar year from 1929–1946. These documents contain not only import quantity, unit of measure, and value, but in some years also the tariff rate, duties collected, and AVEs for specific tariffs. This document is 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.[12]

[11] 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.

[12] 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.

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 for organizing the data but we also 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 map the correct codes to each other across this time period.[13] Out of nearly 6,000 entries in our concordance, well over half 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 nearly 400 products were entirely new.

3.3 Calculating AVEs

To analyze all tariffs on the same basis, we calculate the AVEs for all products that have a specific-tariff component using the tariff data along with the import data.[14] 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.[15] We then add any ad valorem component to the AVE of the specific component, except for 'mixed' cases where we must

[13] Details for all data sources are in Section 8.1 of the Data Appendix.

[14] For Smoot-Hawley AVEs, we use 1933 unit values; for 1946 AVEs, we use 1946 unit values; and 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), those specific tariffs are dropped from the AVEs. Around 600 products are impacted by this issue.

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

compare the AVE of the specific component to the minimum and/or maximum rate to determine which rate applied.

Although we prefer to use AVEs for the term-of-trade analysis, for some summary statistics in the next section it can be helpful to compare specific and ad valorem tariffs instead of AVEs. 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 analyze AVEs that use unit values from a 1933 base year as a robustness for the terms-of-trade analysis.

Underlining the challenges with comparing specific tariffs, we find that the Smoot-Hawley tariff system employed 59 types of units for specific tariffs. We are able 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 finally transforming all dollars-based units to cents-based units (e.g., dollars per pound to cents per pound). Only five units then 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 Other Issues

Some other issues arose during the digitization process, including dealing with mixed tariff and increasing detail in product description that necessitated splitting lines. These issues are mostly important for robustness and completeness of our data, so we include the detailed explanations, examples and corresponding solutions in the Data Appendix. Of particular note, we detail how we dealt with Schedule A codes whose tariffs were not individually negotiated in Appendix **??**.

4 Summarizing U.S. Tariff Liberalization: Smoot-Hawley to the First GATT Round

Given that, to the best of our knowledge, this is the first time detailed tariff data between Smoot-Hawley and Geneva 1947 has been digitized and concorded across time and with import data, we first provide general summary statistics, trends, and stylized facts before our empirical analysis focused on the terms-of-trade motive.

Almost three-quarters of the 5,299 items in our dataset have an ad valorem component. Included in this count are nearly 900 items (about 16 percent of the total) that are duty-free under Smoot-Hawley and remain that way throughout the period. In addition, nearly 800 items (more than 15 percent) have a compound tariff, that is, they have both an ad valorem and specific component in a given year. A further 3 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 comparsion between ad valorem and specific tariffs. This means that Panel A—with items that have only an ad valorem component—represents about 38 percent of products and Table B—with items that have only a specific component—represents about 28 percent of the products in our full dataset.

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 Geneva in 1947. We find that from the Smoot-Hawley tariffs in 1930 to Geneva 1947, both the mean specific and ad valorem tariffs were cut by about 40 percent when considering only products that were dutiable in 1930.

Panel A of Table 2 shows that, for these items with only ad valorem tariffs, the mean ad valorem tariff binding decreases from 39.05 percent in 1930 to 24.58 percent in 1947. The medians are similar to the means, dropping from 35 percent to 20 percent.

For items with specific tariffs, Panel B shows that the mean specific tariff binding decreases from 44.39 cents in 1930 to 26.68 cents in 1947, while the median bindings are much smaller, dropping from 4.5 cents to 3 cents.[16]

Panel C of Table 2 shows the same statistics but now using AVEs calculated using same-year unit values from the import data. Note that the sample size is larger than the sum of the samples sizes in Panels A and B since we can include compound and mixed tariffs.[17] From the Smoot-Hawley tariffs to the Geneva round, the mean AVE tariff binding decreases from 48.49 percent in 1930 to 24.41 percent in 1947. This corresponds to a nearly 50 percent decrease, which is larger in magnitude than 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, compound tariffs—which are excluded from Panels A and B—have much higher average AVEs to begin with and decrease more than the other types. Second, we use 1933 import data to calculate the Smoot Hawley AVEs and 1947 import data to calculate the Geneva AVEs; inflation over this period would have reduced the AVEs even in

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

[17]We continue to exclude non-dutiable items throughout this section for ease of comparison.

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

Panel A: Ad Valorem Tariffs (percent)

	Min	1st Quartile	Mean	Median	3rd Quartile	Max	N
Smoot Hawley	5	25	39.05	35	50	110	1991
1936	4	25	36.52	33	45	110	1987
1939	4	20	33.71	30	45	110	1989
1943	2.5	20	32.89	27.5	44	110	1986
1946	2.5	20	32.65	27.5	40	110	1991
Geneva	2.5	12.5	24.58	20	30	110	1991

Panel B: Specific Tariffs (cents)

	Min	1st Quartile	Mean	Median	3rd Quartile	Max	N
Smoot Hawley	0.00375	1.82	44.39	4.5	25	3000	1389
1936	0.00375	1.5	39.16	4	25	3000	1389
1939	0.00375	1.5	35.46	4	24	3000	1389
1943	0.00375	1	32.11	3.75	18	1500	1389
1946	0.00375	1	31.52	3.5	17.5	1500	1389
Geneva	0.00375	0.95	26.68	3	15	1400	1389

Panel C: Ad Valorem Equivalents (percent)

	Min	1st Quartile	Mean	Median	3rd Quartile	Max	N
Smoot Hawley	0.16	25	48.49	40	60	742.27	3859
1946	0.04	15	32.03	25	43.96	512.21	3677
Geneva	0.03	10	24.41	20	32.5	205.56	3716

All three panels exclude non-dutiable items. Panel (a) includes products that have only an ad valorem tariff. Panel (b) includes products that have only a specific tariff. Panel (c) includes products with all types of tariffs, but necessarily excludes products whose tariff has a specific component but for which there were no imports and thus we cannot calculate a unit value to convert to AVE.

the absence of any changes to the bindings.

Table 3 presents summary statistics for AVEs that hold unit values constant using 1933 unit values. Calculating AVEs that hold unit values constant isolates the contribution of negotiated liberalization, removing the influence of inflation in reducing specific tariffs. When holding unit values constant, the decrease in mean AVEs is smaller in magnitude, 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)

	Min	1st Quartile	Mean	Median	3rd Quartile	Max	N
Smoot Hawley	0.16	25.00	48.49	40.00	60.00	742.27	3859
1935	0.16	25.00	47.94	38.90	60.00	742.27	3862
1936	0.16	25.00	45.58	35.01	58.75	742.27	3863
1937	0.16	25.00	45.57	35.01	58.75	742.27	3863
1938	0.16	25.00	45.56	35.01	58.75	742.27	3863
1939	0.16	20.00	42.73	34.11	53.99	742.27	3866
1942	0.16	20.00	41.49	33.33	52.20	742.27	3866
1943	0.16	20.00	40.12	31.49	50.10	742.27	3866
1944	0.16	20.00	40.03	31.33	50.00	742.27	3866
1946	0.16	20.00	39.54	30.90	50.00	742.27	3867
Geneva	0.16	14.39	31.75	25.00	40.00	742.27	3872

4.1 Other Stylized Facts

The remainder of the section presents other stylized facts we find the data.

4.1.1 Bilateral Trade Negotiations are Important in the pre-GATT Years

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, generally more than half 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.[18] In Table 3, the reduction between Smoot-Hawley and 1946 is about 18 percent, which is not that different from the 21 percent reported in Irwin (2017, p. 485) that uses

[18]Only the agreement with Cuba and the non-agreement preferences for the Philippines did not have their commitments extended in this way.

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 that had non-zero tariffs in 1930[19] saw new commitments in each year. Geneva 1947 saw the largest number of items with commitments of any year: 2,036. The trade agreement with Ecuador in 1938 saw the fewest new commitments at one out of the seventeen items on which the U.S made commitments in this trade agreement.

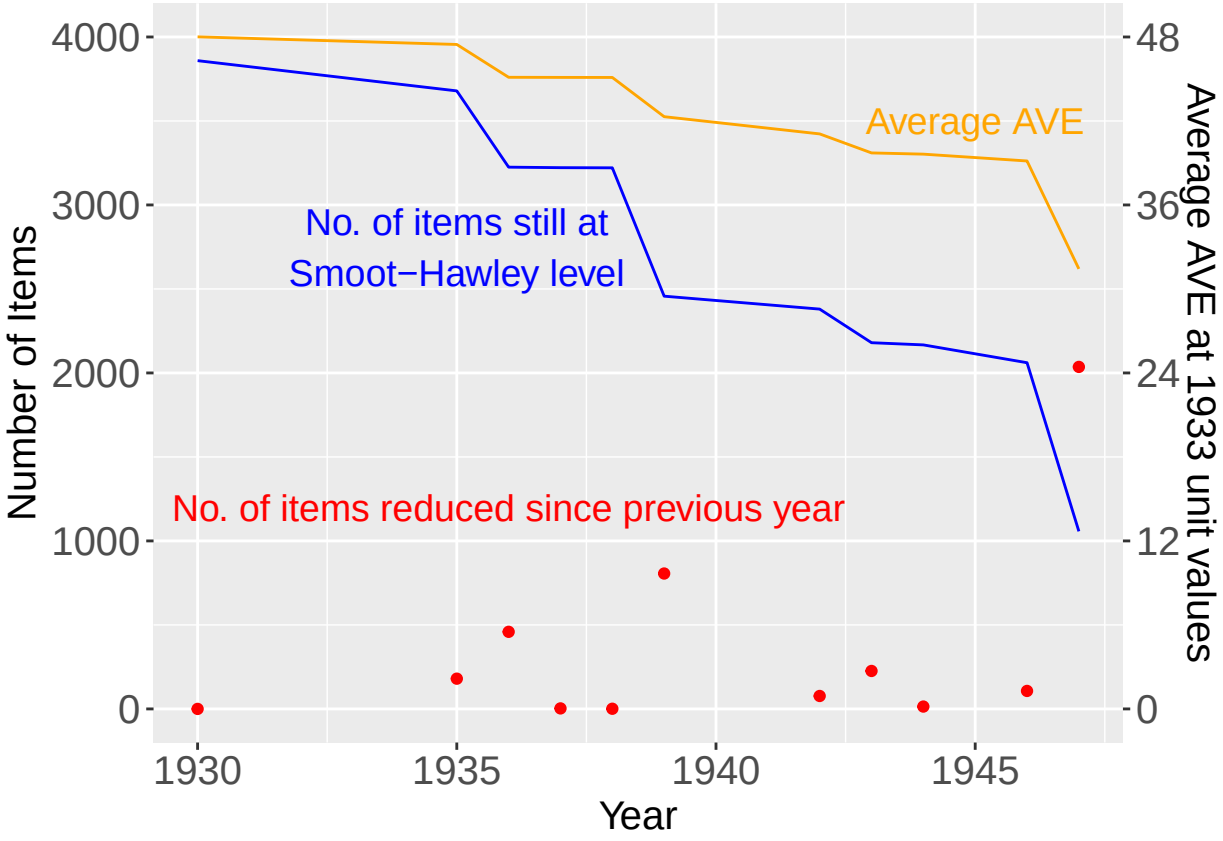


Figure 1: Tariff Reductions by Number of Items

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.[20] Although 2,036 items received commitments by the U.S. in

[19]Note that there were 1,440 items that were duty-free throughout the period or for which we do not have import data to calculate AVEs.

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

the Geneva Round of the GATT, only 1,004 of the items received commitments for the first time. By the end of the Geneva round of the GATT, only 1,057 items remained with no negotiated commitment.

For context, the light (orange) line visualizes the mean AVEs using 1933 unit values that are shown in Table 3. As discussed in Sections 2.1 and 2.3, reductions in AVEs were generally limited by statute. U.S. trade negotiators could only reduce the tariff on any given product by 50 percent between 1934 and 1945; then they were granted authority to reduce another 50 percent from the January 1, 1945 level for each product. There was no such restriction on the number of products on which tariffs could be cut.

4.1.2 There is Significant Heterogeneity Across Product Categories

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

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. Among items in the Machinery group (Group 7), only five have a specific component, while all items have an ad valorem component. At the other extreme, the Edible Animals group (Group 00) has only 56 of its 197 items not having some specific tariff component. Four of the groups have fewer than 4 percent of items with compound tariffs, while over 30 percent of items in Group 4 (Wood and Paper) have compound tariffs.[21] The group with the largest number of compound tariffs is Group 9 (Miscellaneous), which has 184 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 even more important to 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 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 8

[21] 81 items switch between ad valorem and specific tariffs at some point. The counts in Table 4 use the tariff form under Smoot-Hawley. See Section 4.1.4 for more details.

Table 4: Industry Groups in Schedule A

Group	Title	Count of Tariff Type				Total Items
		AV	Specific	Compound	Mixed	
0	Animals and animal products, inedible	311	23	26	89	449
00	Animals and animal products, edible	56	110	5	26	197
1	Vegetable food products and beverages	126	347	5	9	487
2	Vegetable products, inedible	289	95	22	8	414
3	Textile fibers and manufactures	455	120	145	76	796
4	Wood & paper	194	38	105	4	341
5	Nonmetallic minerals	264	127	75	35	501
6	Metals and manufactures	340	248	126	17	731
7	Machinery and vehicles	209	0	5	5	219
8	Chemicals and related products	214	179	97	8	498
9	Miscellaneous	328	139	184	15	666

percent from Smoot-Hawley until 1939, and at least 11 percent from Smoot-Hawley until 1946.[22] Across the industry groups, the magnitude of the average tariff decrease varies. Between Smoot-Hawley and the Geneva round, Groups 0 (inedible animals), 8 (chemicals), and 9 (miscellaneous) experienced tariff decreases around 26 percent, while Group 1 (edible vegetables) had a tariff decrease of just over 40 percent.

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

Group	AVEs				Percentage Decrease		
	SH	1939	1946	Geneva	SH to 1939	SH to 1946	SH to Geneva
0	26.8	22.8	21.7	16.7	14.7	19.1	37.5
00	36.3	32.0	28.9	22.3	11.8	20.5	38.6
1	52.8	48.3	36.7	31.3	8.5	30.5	40.8
2	20.5	17.3	16.9	13.9	15.2	17.2	32.1
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	36.0	33.0	29.9	23.5	8.4	17.0	34.6
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

[22]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.

4.1.3 Tariff Increases are Rare

Although it is rare, we see a few instances of tariffs increasing over the period 1930–1947. There are only three cases where this was caused by a statutory tariff increase. For one category of fur hats (Schedule A number 0754 000), the tariff form changed from compound to specific with an ad valorem minimum that caused an overall increase in the AVE. Something similar happened with a second category of fur hats (Schedule A number 0754 500), with a switch from compound to ad valorem. Finally, upholsterer's nails (Schedule A number 6112 400) increased due to a Section 336 action. When comparing AVEs at 1933 unit values, these are the only three cases of a tariff increase.

There were an additional 110 items that did not see a statutory increase, but did see an increase in the AVE because of reductions in the unit value from 1933–1947. These increases are scattered across all the groups except Group 7 (Machinery & Vehicles).

4.1.4 Switching from Ad Valorem to Specific Tariffs is Rare

Given that inflation was reducing the incidence of specific tariffs in this period (Irwin 2017), one might have expected specific tariffs to be converted into ad valorem tariffs to avoid a loss of protection. Another reason we might expect this conversion is simply that only 8 percent of U.S. tariffs were specific during the three decades since 1988 (Teti 2020).

However, during our period of 1930–1947, we saw only 81 products whose form changed. The most common change was transforming an ad valorem tariff into a mixed tariff, where a specific tariff is bracketed by ad valorem minimum and maximum rates. This was the case for 34 products that were concentrated in the Textiles and Metals groups. In addition, thirteen lines for fur hats were changed from compound to ad valorem tariffs, and four lines changed from compound to mixed.

Thirty products that had a specific tariff in 1930 changed their form: 19 metal products changed to ad valorem, five more metal products switched to the compound form, and six products–mostly glass–changed to the mixed form.

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, which suggests the switching from specific to ad valorem took place at a later date.

5 Terms-of-Trade Analysis

The previous summary statistics provide an overview of the wide-ranging U.S. tariff liberalization following Smoot-Hawley through the first GATT round in 1947. In this section, we use the tariff data merged with U.S. import data as described in Section 3 to better understand what was driving 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), and it 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 tariffs that are too high from the point of view of the country's welfare and 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) and 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 of 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.[23] 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. As the detailed trade data is at the tariff line level, we infer that imports with no recorded import value are zero.

The variable α_G denotes the 93 industry fixed effects for Schedule A subgroups. 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 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

[23] In other words, we do not use U.S. unit values to infer world prices to calculate m^{BR} in Equation 2.

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, it is important that import data reflect the tariffs under Smoot-Hawley. 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 tariff 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 variaables used for robustness checks we introduce below.[24] The baseline analysis sample consists of 4,329 observations due to the availability of Geneva AVE tariffs, Smoot-Hawley AVE tariffs, and 1933 import values. 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 37.86 percent. As expected, this implies that studying U.S. tariff outcomes from GATT is not the trivial case of predicting free trade for all products. 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.

In the baseline sample, 858 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. In addition, 12 products experienced tariff increases.[25] 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.

[24] Section 4 covers these AVEs, but for the sample of all products for which we can compute an AVE.

[25] These 12 products were subject to at least one special provision that impact the tariff rate, a point we return to in the robustness checks.

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 $12,299 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). 643 of the 4,329 observations have an import value of zero, leading to the sample decreasing to 3,686 observations when using the log of 1933 import values.[26]

Table 6: Terms-of-Trade Summary Statistics

	Mean	Std. Dev.	Min	Max	N
Geneva AVE Tariff (1947 Unit Values)	19.46	19.85	0	192.23	4,329
Geneva AVE Tariff (1933 Unit Values)	24.63	26.67	0	407.04	4,329
AVE Tariff Prior to Geneva (1946 Unit Values)	25.00	23.60	0	331.20	4,188
Smoot-Hawley AVE Tariff (1933 Unit Values)	37.86	36.80	0	581.48	4,329
1933 Import Value	0.29	2.88	0	124.14	4,329
Log 1933 Import Value	-4.15	2.74	-13	4.82	3,686
High 1933 Import Value	0.50	0.50	0	1.00	4,329

Notes: AVEs are listed as percentages. Import values are in millions of U.S. dollars.

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 also significant at the 1 percent level. Both of these 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.[27] The estimate on log import values is

[26]Regarding zero import values, @bagwell2011trade 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 19.5 percentage points. Thus, as predicted by the terms-of-trade theory, products with zero imports face smaller tariff decreases, on average.

[27]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.

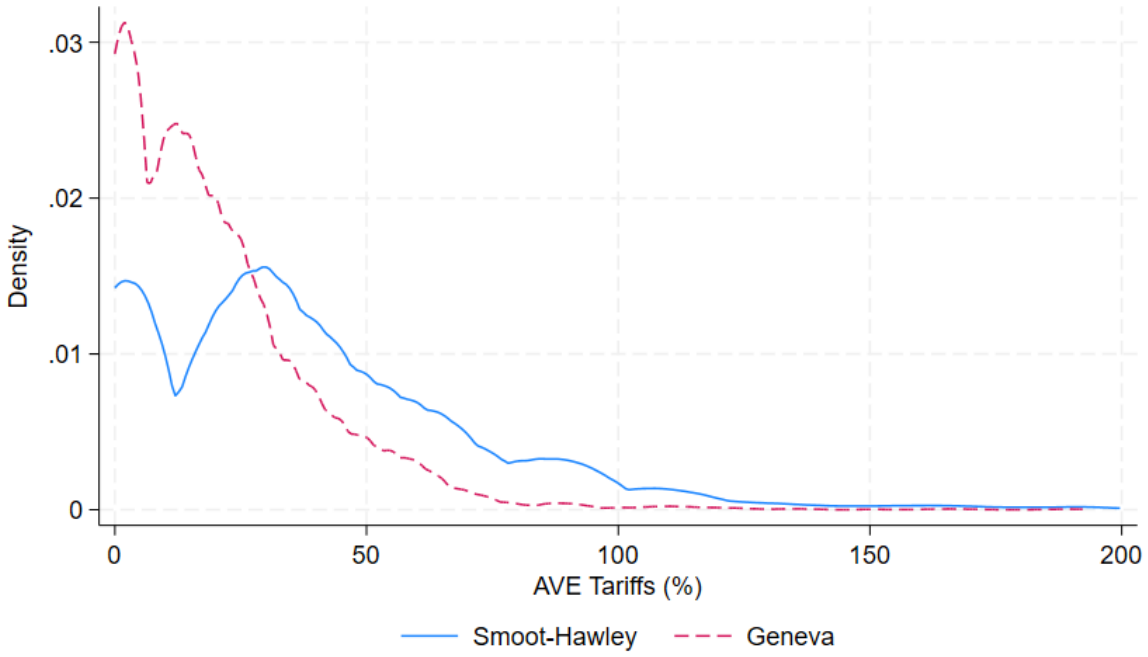


Figure 2: Distribution of Tariffs

Notes: For ease of exposition, several AVE tariffs above 200 percent are omitted from the figure.

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 are influencing 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 ($-0.180 \times 2.88 = -0.5184$). Given the mean GATT tariff is 19.46 percent, this 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 column 2 point estimate on the log import value implies that doubling US import values, all else equal, reduces bound GATT tariffs by about 0.39 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

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	0.289***	0.270***	0.289***	0.338***	0.314***	0.338***
	(0.022)	(0.024)	(0.022)	(0.008)	(0.009)	(0.008)
1933 Import Value	-0.180***			-1.483***		
	(0.061)			(0.319)		
Log 1933 Import Value		-0.393***			-0.615***	
		(0.096)			(0.108)	
High 1933 Import Value			-1.812***			-2.527***
			(0.422)			(0.523)
Observations	4,329	3,685	4,329	4,329	3,685	4,329
R-squared	0.533	0.533	0.534			
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Standard errors in parentheses (OLS are heteroskedasticity-robust). Singleton observations are dropped. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

GATT tariffs by about 1.81 percentage points.

About 20 percent of the Geneva tariffs (or 846 observations) are duty-free in the analysis, which suggests that a Tobit model may be preferred over the OLS model, if disturbances are normally distributed and homoskedastic. The Geneva tariffs are technically not censored, but have a lower bound of zero as tariffs are not negative. Nevertheless, as one robustness check we use a Tobit model and the results are in columns 4–6.

The Tobit results provide additional support for the terms-of-trade theory predictions.[28] The point estimates on each of the import variables continue to 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 56 percent and 39 percent, respectively. However, the Tobit point estimates are not the best measure to compare to the OLS coefficients. We also compute the average marginal effect of the change in 1933 import values conditional on positive tariffs for the Tobit model and find that the adjusted Tobit coefficients continue to be larger in absolute value than the OLS estimates, yet smaller than the Tobit point estimates.[29] Taken together, we view the Tobit results as providing evidence that accounting for the non-negativity constraint on

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

[29]Results are available upon request.

tariffs provides further support for the terms-of-trade theory predictions.

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. 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 also calculate AVEs that hold unit values constant using 1933 unit values for the time period 1930–1947.

In addition to Geneva AVEs calculated with 1947 unit values, Table 6 includes summary statistics when holding unit prices constant at 1933 unit values.[30] The mean Geneva AVE tariff increases to 24.63 percent, up from 19.46 percent when using 1947 unit values, but is still well below the mean Smoot-Hawley tariff of 37.86 percent. This suggests that AVEs using time-varying unit values may be overstating 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 consider the following 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 schedules. In contrast, when holding unit values constant, AVEs only include changes in the tariff schedule. 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, 100 products have Geneva AVEs that are larger than the Smoot-Hawley AVEs

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

when using time-varying unit values, and only 26 products have Geneva AVEs larger than Smoot-Hawley AVEs when using 1933 unit values.

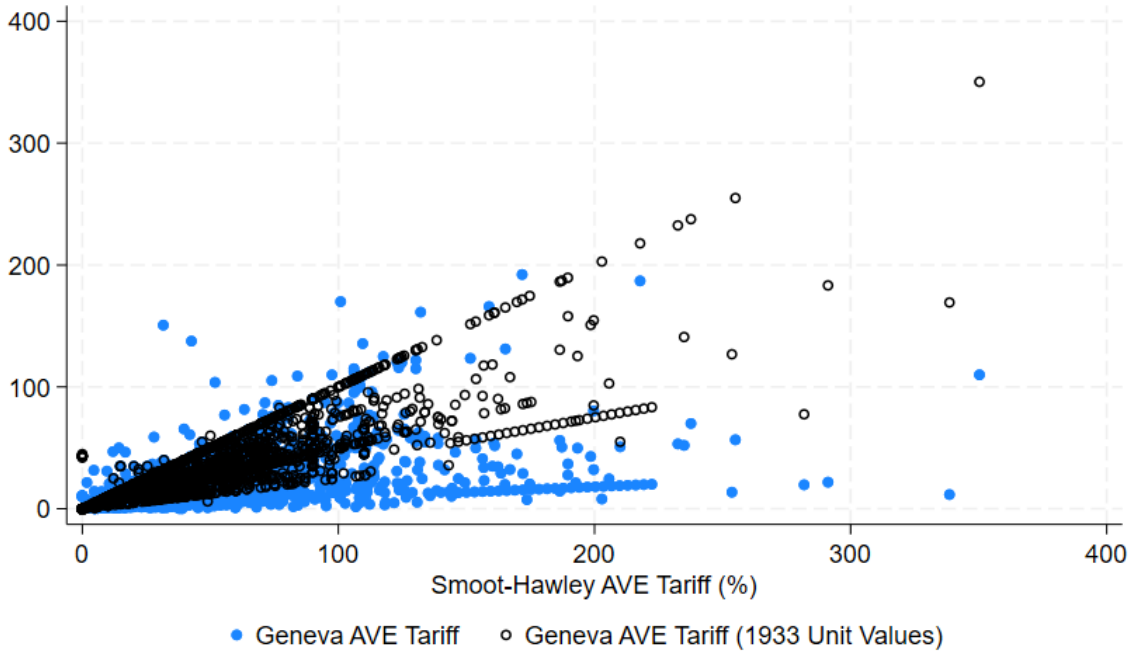


Figure 3: Time-varying Unit Values Versus Constant 1933 Unit Values

Notes: For ease of presentation, one Smoot-Hawley tariff with an AVE above 400 percent is omitted from the figure.

Table 8 includes the regression results when the dependent variable in Equation 3 is the 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, while the magnitude of the point estimates on the level, log, and binary import value variables are generally smaller, but continue to provide negative estimates that are consistent with the terms-of-trade motive. Only the level import value estimate in columns 1 is insignificant; however, the use the log or 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 Prices 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***	0.664***	0.640***	0.696***	0.713***	0.695***
	(0.018)	(0.019)	(0.018)	(0.007)	(0.008)	(0.007)
1933 Import Value	-0.049			-1.253***		
	(0.048)			(0.286)		
Log 1933 Import Value		-0.171**			-0.399***	
		(0.083)			(0.094)	
High 1933 Import Value			-0.721*			-1.349***
			(0.382)			(0.465)
Observations	4,329	3,685	4,329	4,329	3,685	4,329
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). 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 following the RTAA in 1934. The tariffs commitments from 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.[31]

From one point of view, the application of 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 tariff preferences multilaterally.[32] 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

[31] Tariff changes prior to GATT also include changes due to special provisions, a point we return to in a later robustness check.

[32] 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.

one opportunity for trade negotiations. In this way, Geneva Round tariffs in 1947 encompass a series of negotiations over many years.

To disentangle whether the tariff changes from these bilateral trade agreements prior to the Geneva round are consistent with the predictions from the terms-of-trade theory, we consider two robustness checks in Table 9. First, we substitute 1946 AVE tariffs as the dependent variable in Equation 3. 1946 is the last year before the GATT and includes all the bilateral tariff changes that occur between Smoot-Hawley through 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 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.[33]

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 question of whether the U.S. tariff changes in the Geneva round were driven by the terms-of-trade motive or estimates are 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.[34] The regression results are in panel B of Table 9. The number of observations decreases to 2,679 for the specifications that use the level of imports or the binary transformation, and down to 2,294 when using log imports. Across the six columns, the import value estimates continue to be negative and statistically significant at the 1 percent level. Taken together with the 1946 tariff results (panel A), this provides strong support that the terms-of-trade consistent results are driven both by bilateral negotiations and GATT negotiations.

[33] $(37.86 - 25.00)/(37.86 - 19.46) = 0.6989$.

[34] 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).

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	0.367***	0.342***	0.367***	0.427***	0.396***	0.427***
	(0.029)	(0.032)	(0.029)	(0.010)	(0.011)	(0.010)
1933 Import Value	-0.251***			-1.896***		
	(0.086)			(0.365)		
Log 1933 Import Value		-0.593***			-0.852***	
		(0.120)			(0.125)	
High 1933 Import Value			-2.357***			-3.139***
			(0.486)			(0.600)
Observations	4,188	3,549	4,188	4,188	3,549	4,188
R-squared	0.587	0.580	0.588			
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***	0.431***	0.478***
	(0.028)	(0.028)	(0.028)	(0.012)	(0.012)	(0.012)
1933 Import Value	-0.158***			-1.967***		
	(0.043)			(0.507)		
Log 1933 Import Value		-0.477***			-0.947***	
		(0.110)			(0.149)	
High 1933 Import Value			-2.472***			-4.179***
			(0.507)			(0.730)
Observations	2,679	2,294	2,679	2,679	2,294	2,679
R-squared	0.657	0.652	0.660			
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Notes (both panels): Standard errors in parentheses (OLS are heteroskedasticity-robust). Singleton observations are dropped. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

5.5.3 Special Provisions

In addition to the bilateral trade agreements, U.S. tariffs were also impacted by several special provisions prior to GATT. The appendix provides a description for each type of special provision that we encounter in the tariff data, ranging from tariffs set under Section 336 of the Tariff Act of 1930 to those under the Sugar Act. To explore if the empirical results are sensitive to these special provisions we drop products that were subject to any special provision in Table 10. Even with the decrease in sample size, 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.[35]

Table 10: Robustness Check, Drop Products with Special Provisions

Dependent Variable: Geneva AVE Tariff (1947 Unit Values)	OLS			Tobit		
	(1)	(2)	(3)	(4)	(5)	(6)
Smoot-Hawley AVE Tariff	0.324***	0.294***	0.324***	0.380***	0.344***	0.381***
	(0.029)	(0.030)	(0.029)	(0.009)	(0.009)	(0.009)
1933 Import Value	-0.196***			-1.086***		
	(0.042)			(0.350)		
Log 1933 Import Value		-0.383***			-0.604***	
		(0.098)			(0.113)	
High 1933 Import Value			-1.689***			-2.374***
			(0.430)			(0.538)
Observations	3,994	3,407	3,994	3,994	3,407	3,994
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). 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 occuring between Smoot-Hawley and 1946—the year prior to GATT—were generally capped at 50 percent. Between

[35] As an alternative, we used the baseline sample that include special provisions and include a dummy variable that indicates if the product had any special provision as a control variable. The coefficient estimates for Smoot-Hawley tariffs and the import value variables continue to be similar the baseline results in Table 7. The estimate on the special provision dummy variable is statistically insignificant at the 10 percent level. Results are available upon request.

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 could have limited the amount of tariff liberalization over the period. 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.[36]

It is therefore important to test the robustness of our empirical results 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***	0.300***	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***			-1.765***		
	(0.063)			(0.359)		
Log 1933 Import Value		-0.509***			-0.828***	
		(0.103)			(0.129)	
High 1933 Import Value			-2.537***			-3.654***
			(0.473)			(0.631)
Observations	3,404	2,906	3,404	3,404	2,906	3,404
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). Singleton observations are dropped. $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

[36]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 special provision. Between 1946 and 1947, 763 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 any special provisions.

6 Conclusion

This paper has demonstrated that it is possible to compile and concord product-level trade and tariff data for the period 1930–1947. It has uncovered interesting patterns in U.S. tariff commitments across industries and over time. It has also confirmed the terms-of-trade theory in an ideal setting for a large developed economy. Its largest contribution, however, is likely providing the data to advance both academic research and public policy.

Although there is broad consensus among economists that free trade is almost always the optimal policy in terms of aggregate well-being, significant barriers to trade and the concomitant welfare losses remain—especially given the recent return to higher tariffs. This paper's data will be crucial for learning about a range of trade and trade-policy topics that we expect to inform public policy, including for instance how trade policy was used in navigating World War II. For example, providing credible evidence about the role the U.S. as a driving force behind trade liberalization and the benefits of stable, open markets in the historical context can help inform future trade policy.

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8 Data Appendix

8.1 Data Overview

Our data set incorporates two industry classification systems pertaining to imports into the United States during the Smoot-Hawley period. The first is the Smoot-Hawley paragraph number system, which covers import duties. 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 relevant sources and merged using a concordance table, 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 any other data set that employs either the Schedule A system or the Smoot-Hawley paragraph number system. A summary of the data sources is presented in Table 12.

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 a series of nonconsecutive years (e.g., in 1933 but not in 1934 or 1935, and then again in 1936 and 1937). The HathiTrust digital library contains a substantial number of Schedule A reports from 1930 to 1946. However, it does not encompass the entirety of this data set. Consequently, we also utilized the interlibrary loan system through the Syracuse University library to obtain and digitize the remaining reports. Furthermore, these documents are verified and extended through the utilization of import records from the Department of Commerce's series listed in the 5th and 6th row in Table 12.

In Schedule A, the industrial classification of products are classified as eleven "groups" presented in Table 13. And "groups" are further divided into "subgroups" that define the products classification at a finer level. For example in "Group 4: Wood and Paper", there are six subgroups: "Wood, unmanufactured", "Sawmill products(lumber)", "Wood manufacture", "Cork and manufactures", "Paper base stocks", and "Paper and manufactures". Each of them includes a range of products that sharing similar characteristics under its category. We digitized all the 93 subgroups in Schedule A and use them as the industry fixed effects for our analysis.

Table 12: Summary of Data Sources

Document	Content	Years	Sources
Consolidated schedules of tariff concessions	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
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 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 documentation of all GATT rounds' negotiation content for all participating countries. In order to facilitate our analysis, we have collated and digitized the relevant documentation pertaining to the Geneva 1947, Annecy, and Torquay rounds for the United States. Furthermore, we obtained the United States' consolidated version of all bilateral

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

agreements preceding the inaugural round of GATT negotiations, as well as the consolidated document of the initial three rounds of GATT negotiation treaties. We utilized the original scanned copy of the Smoot-Hawley Act to provide supplementary information for special provisions and for products whose tariffs are not the subject of negotiations by 1947.

8.1.3 Bilateral Agreements

The bilateral trade agreements of the U.S. government with other countries had also played an important role in the trade liberalization prior to the foundation of GATT. The Office of the Historian website maintained by the US Department of State collects all the related information of negotiations/correspondence between the two nations for each agreement. The trade agreement documents are stored in *United States Statutes at Large* and the corresponding volumes of each bilateral agreement can be found in the Library of Congress, which contain detailed information of the products and tariffs negotiated in each bilateral agreement. Additionally, the supplementary online appendix provides further detailed information regarding the products involved in the bilateral agreements.

8.2 Concordance

8.2.1 Concordance Between Schedule A And Smooth-Hawley

After digitizing all the documents we need, we concord multiple data sets and classifications into our final data set for analysis[37]. The initial step is to create an "across-concordance" between the Schedule A Codes and Smoot-Hawley Paragraph Number. This is achieved by manually entering the corresponding paragraph numbers for each Schedule A code in the data set. It is evident that a considerable number of products are assigned the same Paragraph Number. In contrast, the Schedule A codes are characterised by more detailed descriptions and a one-to-one correspondence with import records. In order to facilitate the sorting of products within a Smoot-Hawley paragraph, a unique item numbering system was created that utilizes the sequence of Schedule A codes as the basis for the organization of products sharing the same paragraph number. However, in certain instances, some Schedule A codes are also associated with multiple paragraph numbers. In the majority of instances, the multiple paragraph numbers encompass a principal product description and supplementary provisions pertaining to it, such as specific materials or colors. The primary method for determining the major paragraph number for these products is through a process of comparison and selection, with the most relevant descriptions being chosen. Subsequently, the items are sorted 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, the first paragraph number documented in the original government schedules for that line is used instead. 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 Concordance of Schedule A Over Time

This section presents a description of the methodology employed in the "within-construction" of the Schedule A concordance table spanning from 1933 to 1946 to 1948. The Schedule A product list has undergone numerous modifications over time, including alterations to its syntax, provisions, and code, which presents a significant challenge in the creation of a comprehensive panel data set for analysis. In addition to the modifications to the Schedule A numbers, another challenge is the mapping of the relationships between products over time. As with the "across concordance," numerous line mappings are neither unique nor exclusive. In practice, cases may be classified as N-to-1 (one or multiple old codes merge

[37]We discuss our detailed process of digitization in the Supplementary Online Appendix.

into one new code), 1-to-M (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). In the meantime, new products are incorporated into Schedule A, while older products might become obsolete.

The initial step is to select a benchmark year, as the concordance can be constructed in two directions: either 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, more specific codes are added over time as tariff negotiations insert more nuance into the U.S. tariffs. 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 utilize the year just before the Geneva Round negotiations (1946), as our benchmark for the construction of the concordance. The use of 1946 as the benchmark year has the advantage of providing the most comprehensive pre-Geneva rates schedule, which encompasses all bilateral agreements up to the first round of GATT. A prerequisite for the construction of these concordances is the assurance that all Schedule A codes adhere to a uniform format. Accordingly, our Schedule A code identifiers are in the format of 1946, necessitating the filling in of missing digits (typically zeros) from Schedule A 1933 and the careful treatment of the codes that were changed in 1948 to accommodate the Geneva Round concessions lines in 1948[38], as they lack any tariff or import record prior to the GATT.

After setting the benchmark year, we consider five elements when connecting products through time: the Schedule A number, unit of quantity, tariff rate, SH paragraph number, and product description. We classify the matches into six types:

- Type "0", Default: a schedule A code is unchanged through the period and has an equivalent description.
- Type "1", Split: a line in 1933 Schedule A was split into multiple lines in 1946 Schedule A;
- Type "2", Merge: multiple lines in 1933 Schedule A were merged into 1 line in 1946 Schedule A;
- Type "3", New: a new product that does not appear in the 1933 Schedule A;
- Type "4", Reassign: without a change in description, a line was assigned a new code;
- Type "5", 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

[38]We discuss these two steps in more details in the Supplementary Online Appendix.

the logic of the chapter and rephrasing of the descriptions;

There are several advantages of assigning a concordance type to each match: it provides a comprehensive picture of the expansion of the universe of the products included in the Schedule A and it is necessary in order to link the tariff data from Schedule A with the import data to derive the ad valorem equivalence (AVEs).We made these assignments manually for both 1933 to 1946 and 1946 to 1948.

8.3 Some Notable Cases

8.3.1 Free List

Under the Smoot-Hawley paragraph number classification system, items that were free of duty were gathered together into Schedule 16 instead of being integrated into a schedule with like products. That is, the products in Schedule 16 all are free of duty, and unlike the products in Schedules 1-15, the free list products come from many industries. We have integrated these duty-free items into our data organized by Schedule A so that all like products appear together. In fact, many of the free-of-duty products in Schedule 16 of the Smoot-Hawley Act remained unconstrained by trade commitments for many years. In each trade agreement, only some of the free-of-duty products from the Tariff Act of 1930 (Smoot-Hawley) receive commitments to bind the tariff at zero.

Between 1930 and when a product receives a commitment under a trade agreement, the U.S. authorities could conceivably increase the duty on a product unilaterally. What is clear is that once these products were bound in a trade agreement, the U.S. was committed to not subsequently charge a duty on these products. We thus infer that if a product was free of duty in the Tariff Act of 1930 but not included in a subsequent trade agreement, the US government either wanted to have more flexibility on this product or had not yet found a negotiating partner who was willing to exchange commitments involving the product.

While the Smoot-Hawley rates were unilaterally imposed by the U.S. government, we did not find a single case where a Free-list product received a strictly positive tariff up to 1947. However, we did see cases where the unilateral duty-free rates became bound during the bilateral negotiation with other countries and during the GATT.

8.3.2 Mixed Tariffs

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

The line splitting cases are often associated with the introduction of new product specifications. In these cases, the majority of these new lines are created in a subsequent round of the schedules as a consequence of heterogeneous tariff reductions within a general product during the negotiation. To take one 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 with a rate of 10 cents per pound. Subsequently, the 1950 Schedule 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 document this change in tariff, the government divides the original line to accommodate the new import entries subject to different rates. To deal with these cases, we will have two lines in our data with identical 1946 Schedule A codes, Smoot-Hawley rates, pre-Geneva rates, but different 1948.[39] Schedule A codes and different post Geneva rates.

It is worth mentioning that the tariff interval cases we just discussed earlier could also lead to line splitting. For example, product with 1950 Schedule A code 5374900 (Paragraph

[39]The year when the Geneva round became effective.

Number 210) *"Rockingham earthenware"* originally had 25 percent ad valorem rate in the Smoot-Hawley Act in 1930, but as part of the negotiation in the Geneva round, it became 20 cents per dozen of articles as base rate, 7.5 per cent ad valorem as the minimum rate and 25 per cent ad valorem as the maximum rate. In this case, we also split the line into three different lines, keep the pre-Geneva values as the same and change the post-Geneva values.

***A major challenge to deal with the line splitting is matching the import data over time. (Could you provide a short sentence or two on how we dealt with these splitting in the import data, especially when calculating the AVEs? I thought we dealt with this part differently from the mixed tariff cases.).**

8.3.4 Special Legislations In The Tariff Data

The provisions listed below are typically unilateral tariff reductions on certain groups of products decided by the U.S. government. Each of these special provisions focuses on a particular group of products, but we run a robustness check that excludes them since, in principle, one would not expect the terms-of-trade hypothesis to hold for unilaterally-set tariffs.

- ***Section 336***: The Section 336 is also known as the flexible tariff provision. It was created to give the United States' president authority to unilaterally change individual import duties–either to increase or decrease tariffs by up to 50%. Importantly, products under this provision may have non-cooperative rates (Column 2 rates) different from the original Smoot-Hawley rates. There are 168 products in our data that are related to Section 336.

- ***Quota Provisions***: There are has two types of quotas in our data. First are absolute quotas, in which once a certain amount of a particular item is imported during the quota period, no more of that item can be imported. Second are tariff-rate quotas, which allow a certain amount of goods to be imported at a lower tariff rate, and quantities in excess of the quota are imported at a higher tariff. There are 36 products in our data that were subject to a quota.

- ***Sugar Act***: We see several revisions to the Sugar Act during our time period. Its goal was to control sugar imports into the US and stabilize the sugar sector. The Sugar Act offered short-term solutions to control the sugar market and preserve price stability. The Act included the establishment of quotas and tariffs on sugar. It was set to limit

the amount of sugar imported to the US to protect domestic sugar producers from foreign competition. There are 80 products in our data that fall under the Sugar Act.

- ***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 where a domestic excise tax exists to make sure foreign producers did not escape the excise tax and gain an advantage over domestic producers because of it. IRC rates were sometimes included in bilateral negotiations. There are 279 products in our data that were impacted by internal tax provisions.

- ***Emergencies***: Emergencies are related to Section 318 of the Tariff Act of 1930, which 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, he 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.[40]. There are 5 products in our data that are related to this provision.

- ***The American Selling Price***: This provision allowed for the tariff to be calculated on the basis of domestic prices instead of the price charged by foreign exports on some products. It was used, in particular, for chemical products. There are 42 products in our data that are related to this provision.

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