The Regressive Nature of the U.S. Tariff Code: Origins and Implications

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Abstract

The U.S. tariff code has a surprising and little-known feature: Tariffs are systematically higher on lower-end versions of goods relative to their higher-end counterparts. For example, a handbag made of reptile leather has a tariff rate of 5.3 percent, while a plastic-sided handbag has a tariff rate of 16 percent. In this paper, we document the presence, historical origins, and consequences of this regressive pattern. Regressive tariffs are present throughout the tariff code, but are especially pervasive in consumer goods categories, where tariffs are 1.2 percentage points higher, on average, for low-value varieties. Using a newly constructed dataset on legislated tariffs that covers all major trade agreements back to the 1930 Smoot-Hawley Tariff Act, we show that this variation in rates across varieties largely originated in trade agreements made in the 1930s and 40s and has persisted over time. Welfare estimates suggest that the regressive nature of tariff rates on consumer goods has important distributional consequences.

Keywords: Trade Policy, Inequality, Gains from Trade, Tariffs, GATT

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1 Introduction

In trade models, tariffs are typically represented as a simple "τ"—a wedge between the buyer's and seller's price of traded goods. In reality, the U.S. tariff schedule is much more complex—today's schedule comprises 4,394 pages of tariffs on 19,347 varieties of goods. Tariff rates on many of these products have been negotiated over for more than a century by many interested parties—from countries and industries to politicians and consumers—and in response to economic conditions of the time. The size of the tariff schedule and the intricate political process that determines it raises questions about the extent to which tariffs are hysteretic in nature: Is the tariff schedule today determined by negotiations of the past, and, if so, what consequences does this have for how today's imported goods are taxed?

In this paper, we study hysteresis in tariffs through the lens of a little known but consequential pattern in the modern U.S. tariff schedule: Tariff rates are systematically higher on low-value versions of goods relative to their high-value counterparts. For example, the tariff on a $400 handbag made of reptile leather is 5.3 percent, while the tariff on an $8 plastic-sided handbag is 16 percent. To this point, this regressive pattern has been noted anecdotally,[1] but we show systematically that it is present across the entire tariff schedule, and is especially pervasive among consumer goods. Using newly digitized tariff schedules going back to the 1930 Smoot-Hawley Act, we show that regressivity originated in the 1930s and 40s and has persisted through vast changes in the economic landscape. Despite its historical origins, the pattern is still relevant for consumers today: We show that eliminating regressivity in the tariff code can amplify the pro-poor gains from trade liberalization.

In the first part of the paper, we document the presence of regressive tariffs throughout the modern U.S. tariff code. We compare tariff rates among "varieties" of narrowly defined "goods," and find that for roughly 60 percent of dutiable goods, low-value varieties face a higher tariff than the high-value varieties of the same good. We call the goods that fit this pattern "regressive

[1] First, by Gresser (2003), and more recently by Furman et al. (2017), who describe a number of consumption goods categories for which unit values (a proxy for prices) are negatively correlated with statutory tariff rates.

goods." The share of regressive goods varies widely across industries, and is especially high for consumer goods, where over 70 percent of dutiable goods are regressive. Not only are tariffs on low-value varieties higher than tariffs on high-value varieties, but in many cases, the discrepancy in tariff rates across varieties is substantial. Averaging across all goods, tariff rates on low-value varieties are around half a percentage point higher than tariff rates on high-value varieties, and among regressive goods, the average differential is around 4 percentage points.

We next show that regressivity is not a new phenomenon. Over the last 30 years, relative tariff rates on low- versus high-value varieties have been remarkably persistent, suggesting that the divergence in rates between these two groups emerged earlier. Data availability, however, precludes a simple answer of "when" and "why" regressivity emerged. To address these questions systematically, we construct a new dataset by digitizing U.S. tariff schedules following every major trade agreement back to the 1930 Smoot-Hawley Tariff Act. Analyzing these new data, a clear picture emerges: As a whole, tariff rates have come down over time, but relative tariff rates among varieties of the same good are largely functions of trade negotiations of the past.

Through detailed case studies of several goods, including fishing reels, forks, and bicycles, we uncover two primary drivers of the divergence between tariff rates on low- and high-value varieties. First, in some cases, tariff rates were reduced as concessions to important trading partners, who tended to be advanced economies producing higher-end varieties of goods. Countries that were considered core participants of the General Agreement on Tariffs and Trade (GATT) negotiations in the mid-twentieth century were 25 percent more likely to export high-value varieties. In other cases, tariff rates remained elevated on low-value varieties in order to protect a domestic industry from import competition, leading to regressivity in cases where the domestic industry specialized in production of a low-value variety. In most cases, tariff rates diverged to fulfill one of these two policy priorities in the 1940s through 1980s, and the gap has persisted despite rates trending down as a whole through the late 1980s. It is in this sense that we say that U.S. tariffs exhibit hysteresis: Much of their variation today is the result of trade agreements from the past.

Using our newly digitized data, we broaden the scope of our case study analysis in several ways.

First, using time series of individual tariff rates traced back to 1930 on a panel of representative consumer goods, a clear picture emerges. The divergence between average rates on low- versus high-value varieties begins in the late 1930s, when the United States began to engage in bilateral negotiations to lower tariffs after the era of global protectionism that emerged with the passage of the Smoot-Hawley Act of 1930. At each round of GATT negotiations, which began in 1947, tariff rates on all products were reduced, but regressivity was never eliminated. Furthermore, after the Uruguay round of the GATT ended in 1993, average tariff rates on all varieties have been remarkably stable. Zooming in on the period between 1930 and 1946, we show that the Anglo-American Trade Agreement of 1938 was an important source of regressivity: The average decrease on high-value varieties made in this agreement was around 25 percentage points, while the decrease in rates on low-value varieties was only 2 percentage points. Lastly, we decompose the variance of tariff rates across the entirety of the tariff code using digitized tariff schedules between 1946 and 1980, to confirm that variation in tariff rates within goods (the level at which regressivity arises) tripled between 1930 and 1946, declined between 1952 and 1958, and then settled at around 1.5 times its 1930 levels in 1963, where it remains today.

In the last part of the paper, we present several reduced-form exercises aimed at understanding the distributional consequences of tariff regressivity. There, we show that consumers would save a little over $4 billion on imported goods (via savings on tariff revenues) if the regressive pattern were eliminated. These savings would likely not be shared equally across the income distribution. Using the sufficient statistics approach from Borusyak and Jaravel (2021) and a reduced form exercise, we show that regressivity amplifies the pro-poor effects of trade liberalization. In a baseline counterfactual tariff schedule in which we lower tariffs uniformly by 5 percentage points across all varieties, the average welfare gain for an individual earning $20,000 per year is around double the gain for an individual earning $100,000 per year. When we additionally eliminate the regressivity in tariff rates, the lower-income individual gains about three times as much, showing that eliminating regressivity would amplify the pro-poor gains from trade liberalization. While our estimates pertain to U.S. consumers in 2017, the welfare implications may be more widespread:

We show that regressivity has been a longstanding feature of U.S. tariffs, and is a feature of the tariff schedule of the E.U.

This paper contributes to several different strands of literature, starting with the small literature on classification in trade. Related to our finding that tariff rates were often set in order to appease certain trading partners, Grant (2021) argues that the entire system used to classify traded goods in the United States is determined endogenously, as the policymaker weighs the benefits of better policy targeting against the costs of more complex classification schemes. In earlier work, Gowa and Hicks (2018), Gulotty (2018), and Tavares (2006) find that tariff lines are often split or reclassified to accommodate political goals. Our work provides evidence of this type of endogeneity, and its economic consequences. We also put these previous findings in a dynamic setting: Not only is classification endogenous, but it can be hysteretic as well. Endogenous classification decisions are not necessarily revisited and re-optimized in each period, but can persist even as the economic landscape shifts.

We also contribute to the literature that seeks to understand the political economy of the world trade negotiations that took place throughout the 20th century and their subsequent effects. Related to our finding that variation in tariff rates emerged during the pre- and early GATT years, Bown and Irwin (2015) study tariff levels in the 1940s and early 1950s and find that tariffs fell by relatively more in the early rounds of the GATT for a core group of GATT participants—the United States, United Kingdom, Canada, and Australia—than they did for many other important countries (including other non-core GATT participants). More recently, Bagwell et al. (2020) analyze recently declassified tariff bargaining data from the Torquay Round of the GATT and document that negotiations were characterized by a lack of strategic behavior among participants and an important multilateral element to bargaining. Our work shows the persistent economic consequences of these negotiations.

Our findings are also consistent with a group of papers that seek to understand the role that developing countries have played in multilateral trade negotiations over time. Many papers—for example, Jawara and Kwa (2004), Subramanian and Wei (2007), Bagwell and Staiger (2013)—

have documented that, while developing nations were participants in the GATT negotiations, they did not benefit from these negotiations in the same way that advanced economies did. Special and differential treatment provisions for developing economies, like the Generalized System of Preferences (GSP), may have had perverse effects, actually weakening their negotiating power (see, for example, Grossman and Sykes (2005) and Özden and Reinhardt (2005) on GSP).[2] This asymmetric power dynamic rendered the markets most important to developing countries—like shoes, textiles, and apparel—the least negotiated, and were sectors where the "terms of trade externality" forces of multilateral negotiations (first outlined in Bagwell et al. (2002)) were least likely to play out (as shown in Ludema and Mayda (2009) and Ludema and Mayda (2013)). These same industries are the ones where we find the strongest evidence of regressivity today, driven precisely by asymmetric negotiating presence among different producing nations.

Lastly, we contribute to the growing debate within the literature on the distributional effects of trade. Estimating the gains from international trade has been a central and long-standing question for policymakers and researchers. A more recent strand of the literature has acknowledged that the gains from trade may be distributed unevenly because individuals across the income distribution differ widely in the goods that they consume. Using data on aggregate expenditures and a nonhomothetic demand system, Fajgelbaum and Khandelwal (2016) find that trade favors individuals at the lower end of the income distribution, who tend to concentrate spending in more traded sectors. He (2018) also finds that trade has pro-poor effects and reduces real-wage inequality, and Hottman and Monarch (2020) find that, due to non-homotheticities, low-income consumers experienced more import price inflation than high-income consumers between 1998 and 2014. On the other hand, Borusyak and Jaravel (2021) find that the purchasing-power gains from lower trade costs are distributionally neutral. While we do not present a fully specified structural model, as in the aforementioned studies, our reduced form estimates align with the studies that find that trade has pro-poor effects. Perhaps unsurprisingly, we find evidence consistent with the notion that individuals with lower income tend to consume relatively more of low-value varieties. Taking this detailed

[2] Nunn (2019) discusses similar asymmetries created by anti-dumping duties and other development policy.

regressivity into account has an effect over and above previous findings, shifting the distribution of gains from trade liberalization even more toward the left tail.

The rest of the paper proceeds as follows: In Section 2, we define regressivity and document that it exists throughout the modern-day tariff code. In Section 3, we perform detailed case studies on a few consumer goods in order to illustrate when and why regressivity emerged. In Section 4, we describe the newly digitized dataset on legislated tariff rates since 1930 that we rely on for our historical analysis. We use this data, in Section 5, in order to bolster the case studies with some more systematic evidence. In Section 6, we consider the welfare implications of regressivity, then we conclude in Section 7.

2 The Regressive Nature of the U.S. Tariff Code

In this section, we document the pattern that is the focus of this paper: Tariffs are higher on low-value varieties of goods. We start by defining what "goods" and "varieties" are in the context of the Harmonized Tariff Schedule (HTS) in Section 2.1, and present summary statistics of those goods in Section 2.2. In Section 2.3, we define and present metrics by which to summarize the tariff differences on varieties of each good. In Section 2.4, we present alternative definitions and robustness checks. Our baseline analysis is performed on the 2017 U.S. tariff schedule; in Section 2.5, we ask whether the pattern has held over time (over the last 30 years) and in other countries (the EU). Our analysis reveals that the regressive pattern is not a new phenomenon, nor is it unique to the United States. These findings motivate the historical analysis presented in Sections 3 and 5.

2.1 Defining a "Good"

Documenting the regressive pattern in the tariff code requires a careful comparison of tariff rates and unit values among varieties of narrowly defined goods. The World Customs Organization classifies every internationally traded good by a six-digit Harmonized Commodity Description and Coding Systems (HS) numeric code. Countries are then permitted to provide more detailed classifi-

cations by adding digits to each good's HS code. In the United States, these detailed classifications take the form of ten-digit Harmonized Tariff Schedule (HTS) codes, which are administered by the U.S. International Trade Commission and enforced by the U.S. Customs Bureau. Following convention, the term "HS code" is used herein to describe HTS or HS codes, unless the distinction is important. Eight-digit codes define a good's "U.S. rate line," and ten-digit codes describe its "non-legal statistical reporting category."[3] Accompanying these numeric codes are text descriptions of each good. Because an important part of our analysis is ensuring that we are comparing the tariff rates on different varieties of the "same good," we rely on the text descriptions to help define "goods" within the HTS. In robustness exercises, we show that our findings hold using alternative definitions of goods and varieties.

The best way to see how we use the text descriptions of the tariff code to define goods and varieties is by example. Table I presents all of the varieties (ten-digit products) within the four-digit HS code 8215—a category that encompasses "spoons, forks, ladles, skimmers, cake-servers, fish-knives, butter-knives, sugar tongs and similar kitchen or tableware; and base metal parts thereof." The format of the HTS is such that descriptions get more and more detailed as additional digits are added to the HS code. Unfortunately, however, because of the vast coverage and complexity of the HTS, there is no simple rule that establishes an HS-digit level N such that all HS-N codes define goods, and HS-M codes (for $M > N$) are varieties of that good. That fact is apparent here, with spoons falling into two different HS-6 codes (8215.91 and 8215.99). Additionally, in some cases, varieties of two different goods might be classified under the same HS-N code. For example, 8215.99 contains forks and spoons, with forks running from 8215.99.01 through 8215.99.26, and spoons starting thereafter with 8215.99.30.

Ameliorating these complications is the layout of the HTS, which uses different levels of in-

[3]For the vast majority of products, tariffs are set at the eight-digit level. As of 2019, the exceptions are five eight-digit HTS codes corresponding to copper ores, lead ores, silver ores, other precious-metal ores, and "ash and residues containing mainly zinc." See https://www.usitc.gov/tariff_affairs/about_hts.htm for the naming of eight- and ten-digit codes, and https://pubapps2.usitc.gov/tariff/readme_hts.jsp, which notes that eight-digit goods with more than one tariff rate (i.e., eight-digit codes with different tariffs at the ten-digit level) have `NA` as the unit of quantity. Within eight-digit codes with `NA` units of quantity, only the five mentioned above have ten-digit tariff rates that are not uniform within the eight-digit code.

dentation to highlight relevant splits of HS codes into "like" categories. Returning to the example in HS 8215.99, the fork/spoon demarcation becomes clear once we leverage these indentations: All of the forks lie under the "Forks" heading (or have descriptions beginning with "forks"), and spoons lie under the "Spoons and ladles" heading (or have descriptions beginning with "spoons"). Each additional level of indentation introduces additional descriptive text for the HTS lines subsumed by it (that is, by varieties that are more indented). When this descriptive text begins with one or two *nouns*, and no nouns are used to start the description of any more-indented varieties, we use that noun as the definition of a good for that HTS line and all HTS lines subsumed by that indentation.[4] We find the part of speech of each word using the Penn Treebank project, described in Marcus et al. (1994), which, while not particularly new, is still the natural language processing industry standard.[5] To minimize the risk that different nouns could be used describe different goods (for example, "fish" could be used to describe the animals or "fish hooks"), only noun-groupings within HS-4 groupings are considered "goods."[6] So, in the example of table I, the goods introduced are 8215-sets, 8215-spoons, 8215-table forks, 8215-tablespoons, and 8215-forks.[7]

2.2 Coverage of the Tariff Schedule

Our main analysis focuses on the subset of total imports into the United States that can be reasonably classified into "goods." As such, we drop a few classes of imported varieties. First, we drop two chapters of the schedule (98 and 99) that reflect special and temporary tariffs. Second, we

[4]We also consider adjective-noun pairs, which (anecdotally) does not split goods into varieties.

[5]This tagger considers not only each word individually but also its surrounding words. So, for example, in "I went fishing," fishing is a verb, while in "fishing reels," fishing is a noun.

[6]The level of detail and margin of delineation for goods described in the HTS reflect trade patterns. So, for example, while meat of horses, asses, mules, or hinnies are all classified by the four-digit HS-code 0205, with no further delineation, the meat of lamb is broken down into ten-digit codes depending on the body part for bone-in meat, and eight-digit codes for boneless meat. This, and countless other examples, support the claim that defining a good based on its HTS code alone leads to definitions of goods that are inconsistent with what a human reader would define. However, at a high-enough level of aggregation the HS codes are useful for separating types of goods.

[7]From a text-processing perspective, this technique produced far more reasonable results than other more-sophisticated natural language processing tools. Perhaps the easiest way to see why an untrained algorithm would have difficulty in defining a good is to consider again the forks example. Suppose that the four varieties were silver forks, silver spoons, steel forks, and steel spoons. Without any additional information, algorithms that measured the similarity of each string have no way to know that spoon/fork is the right delineation, rather than steel/silver. The algorithm defined above leverages the fact that human beings created the layout of the HTS.

drop goods with no listed unit of quantity, since our analysis requires us to define the unit value of imported varieties. Third, we drop varieties that were not classified into a "good" using the algorithm described above. The vast majority of these cases arose from varieties that were described as "other" in the tariff schedule, as in the example of Table I. Finally, we only analyze goods with at least one variety, since our focus is on within-good tariff variation. Overall, our data cover $1.3 trillion of $2.3 trillion in total U.S. imports of goods in 2017. The largest losses in coverage of imports come from the second (no listed unit of quantity) and final (only one variety) steps, which represent about $650 billion of imports.

Table II presents summary statistics of the goods and varieties covered by our analysis. Since our objective is to demonstrate the pervasiveness of the regressive pattern across the tariff schedule, we present statistics for the full dataset, as well as for a few key subsets. The first three subsets—Consumer, Intermediate, and Capital goods—are categorized using the UN's Broad Economic Category (BEC) classification of 6-digit HS codes.[8] The final column represents a category of goods that we call low-tech consumer goods or LTCGs. This category consists of all (6-digit HS) varieties that are classified as consumption varieties under the BEC, but exclude food, electronics, and vehicles.[9] What remains are the types of household products that consumers purchase at a regular frequency, akin to non-durable consumption.

There are a few important takeaways from these summary statistics that illuminate the heterogeneity that exists in tariff rates across the tariff code. First, though tariff rates are often thought of or modeled as being uniform across good or industries, the fifth row of Table II shows that there is a substantial amount of variation in tariff rates at very disaggregated levels. Whether by count or by value, the majority of goods in each category have within-good variation in tariff rates. This is especially true for LTCGs—83 percent of LTCG goods have within-good tariff variation. This

[8]The BEC categorizes transportable goods according to their end use. The classification is more detailed than the three categories we present here, which are based on the categorization of BECs into three System of National Accounts categories, plus a residual. The details of both categorizations can be found in United Nations (2002). The crosswalk from BEC codes to 2017 HS codes is available from https://unstats.un.org/unsd/trade/classifications/correspondence-tables.asp.

[9]Specifically, we exclude varieties from sections I–IV of the HS (food), section XVI (machinery), and section XVII (transportation equipment).

may be in part because LTCGs also have a higher average number of varieties-per-good than the other categories, suggesting that these goods have received more attention from policymakers (in the framework of, e.g., Grant (2021)).[10] Lastly, consistent with the conventional wisdom that the United States has relatively low tariffs on average, the average (import-weighted) tariff rate across all goods is only 1.9 percent. Aggregation, however, masks substantial heterogeneity in tariff rates in different categories. Consumer goods and LTCGs have much higher average tariffs of 5.1 and 7.6 percent, respectively. In fact, LTCGs represented only 16 percent of imports in 2017, but accounted for 63 percent of total import duties.

2.3 Regressivity Across the Tariff Code

To evaluate the pro/regressivity of tariff rates, we start by sorting (HS10) varieties into within-good quantiles based on their unit-values. Specifically, within each good we classify varieties in the top quantiles as "high-value" varieties, and those in the bottom quantiles as "low-value" varieties. We then compare average tariff rates on varieties within each quantile. Our baseline approach splits goods at the median, though we show below that we obtain similar results when we split goods into quartiles.

We find that regressivity is pervasive across the tariff schedule. Figure I shows the share of goods for which the average tariff on low-value varieties is higher than the average tariff on high-value varieties. We compute this statistic for different industry groups using *ad valorem* equivalent (AVE) most-favored-nation (MFN) rates.[11] The dark blue bar on the right of Figure I shows this breakdown for all goods. In the aggregate, 60 percent of dutiable goods exhibit the regressive pattern. This share varies widely across industries (seen in the gray bars) and industry groups (the light blue bars, which depict BEC-classified categories). Intermediate goods industries like metals, plastic, and rubber are at the low end of regressivity, with fewer than half of goods in those

[10] The consumer good with the most varieties is cheese, with 59 varieties, whose low-value variety includes Velveeta, and whose high-value variety consists of Edam and Gouda cheeses.

[11] Data on legislated tariff rates (i.e., *ad valorem* rates) come from the U.S. International Trade Commission's website and Feenstra et al. (2002). Data on trade flows and effective tariffs come from Schott (2008). The AVE rate is the sum of the *ad valorem* rate with the quotient of the specific rate and unit value.

industries exhibiting the pattern. Among consumer goods and LTCGs, on the other hand, almost three quarters of dutiable goods are regressive goods.

Not only are tariffs on low-value goods higher than tariffs on high-value goods, but in many cases, the discrepancy in tariff rates within goods is substantial. Figure II shows the average tariff differential between low- (below median) and high-value (above median) varieties in each category of goods. The dark blue bars show the differential for all goods and the red bars restrict the sample to only the "regressive" goods, or the goods that fit the regressive pattern. Averaging across all goods, tariff rates on low-value varieties are around 0.4 percentage points higher than tariff rates on high-value varieties. Among regressive goods, the differential is around 4 percentage points. Differentials are magnified in the LTCG category. Across all LTCGs, tariff rates on low-value varieties are 1.24 percentage points higher than the rates on their high-value counterparts, and among regressive LTCGs, the differential is 5.3 percentage points.

The fact that regressivity is so commonplace across the tariff code is a hint that the pattern is economically significant, not just a harmless statistical quirk. The statistics presented above are based on unweighted averages of varieties and goods, which we focus on as our baseline due to the potential endogeneity of imports to tariff rates. In Appendix A.1, we show that the regressive pattern holds when we use import-weighted averages as well. More discussion of the economic significance of regressivity can be found in Section 6.

2.4 Robustness: Alternative Definitions and Global Presence

There are other justifiable ways to define and calculate the statistics presented above. In Table III, we show that alternative statistics and subsamples tell the same story. In the table, the baseline analyses of Figures I and II are shown in tabular form in the first, fifth, and sixth rows, respectively.

The shares of regressive goods, shown in the second through fourth rows, are quite stable across various alternative definitions of a "regressive good." The second row shows our estimates when we the split goods into quartiles by unit value, rather than at the median (our baseline). Put differently, a good here is "regressive" if the average tariff on the bottom quartile's goods is higher

than the average tariff on the top quartile's. In the third row, we alter the definition of a "good" from the text-based measure in our baseline, to a five-digit HS code/unit of quantity pair.[12] The results are consistent with our baseline. Next, to address the fact that specific tariffs (a fixed duty per unit) can mechanically make a good look regressive, the fourth row uses only the *ad valorem* component of legislated tariffs. Finally, to ensure that what we refer to as differences in "value" are not driven solely by a variety's country of origin (i.e. that there is not a price premium for goods from certain countries that is independent of value or quality), we redo our analysis replacing unit values with adjusted prices that are calculated by stripping out country-time-product category fixed effects.[13] Our results, shown in the fifth row, are robust to this adjustment.

Tariff differentials—shown in the sixth through eleventh rows—are also quite stable across definitions. The sixth and seventh rows reproduce, respectively, the blue and red bars in Figure II. While the use of only the *ad valorem* component of rates reduces the tariff differential, shown in the eighth and ninth rows, in general, this is less pronounced for LTCGs, and does not meaningfully impact the fraction of regressive goods. In the tenth row, we redefine both goods, and the tariff differential, using effective tariffs (tariff revenue divided by imports) rather than statutory rates. This ensures that the rates account for 2017 sourcing patterns. The tariff differentials are essentially unchanged. Using origin-adjusted prices leads to larger tariff differentials.

In the bottom two rows, we show an alternative metric for defining regressivity: the average correlation of unit-values and tariff rates within a good. The same general takeaway holds here: Tariffs tend to be lower on varieties with higher unit values. Among regressive goods, this correlation is quite pronounced, at -0.72 for all goods. Taken together, this evidence suggests that the pattern of regressivity is robust to our choice of data and definitions.

In Appendix A.2, we show that the regressivity also pervades the tariff schedule of the European Union. In light of the historical analysis below, this will not be surprising. There, we

[12] In other words, varieties are grouped into those with their first five HS digits matching, and also have the same unit of quantity (e.g., kilogram, pairs, pounds, etc).

[13] Specifically, let q_{ict} and v_{ict} be the quantity and value, respectively, of imports of variety i from country c in year t. We regress log unit values, $\log(v_{ict}/q_{ict})$, on 4-digit HS $\times$ country $\times$ year fixed effects. Denoting the residual by $\hat{p}_{ict}$, we reconstruct variety i's unit value in year t as $\left(\sum_c \exp\left(\hat{p}_{ict}\right) q_{ict}\right) / \sum_c q_{ict}$.

highlight that much of this regressivity emerged as a result of early GATT negotiations, in which EU members (in 2017, i.e., including the United Kingdom) were the primary contributors. While beyond the scope of the current paper, it is worth noting that the presence of regressivity in the tariff schedules of a bloc of countries that (including the U.S.) make up about 30% of global imports, also has implications for the *producers* of low- vs. high-value varieties of goods. To the extent that low-value varieties are produced by lower-income countries (consistent with our historical analysis), the regressive pattern can have not only domestic, but also global distributional implications.

2.5 Regressivity is Not a New Phenomenon

The statistics presented thus far are representative of modern times, based off of the 2017 U.S. tariff schedule. Figure III shows, however, that regressivity is not a new pattern in the data. Panel (a) of Figure III shows that not only have average tariff rates remained relatively flat between 1989 and the present, but the gap between rates on low- and high-value varieties has also been unwavering.[14] This is even more pronounced for LTCGs, shown in panel (b). This recent stability raises the question of *when* this regressive pattern emerged and, given the changes in the economic landscape and global sourcing patterns over the last 30 plus years, are these relative tariff rates still optimal, or are they remnants of a past era? In the next several sections of this paper, we seek to answer these questions.

3 Origins of Regressivity: A Case Study Approach

The analysis presented in Section 2.5 suggested that the modern-day regressivity in the tariff schedule had its origin before the availability of digitized legislated tariff schedules. In order to understand when and why the pattern originated, we performed detailed case studies on three goods—fishing reels, forks, and bicycles—that exhibit regressivity today and are among a larger set of

[14] Here, to allow for comparability across tariff schedules, we use define "goods" using five-digit HS codes. The gap tariff gap is a bit larger than under the text-based measure.

regressive consumer goods that we study more-systematically in Section 5. Our detailed historical investigation, described in sections 3.2 and 3.3, suggests that the divergence in tariff rates between low- and high-value varieties dates back to the mid-1900s before and during the early rounds of the GATT. While each variety of each good has its own history of tariff rate changes, the policy priorities driving the emergence of the regressive pattern tend to fall into one of two categories: concessions to important trading partners (lowering relative rates on high-value goods) or protection for domestic industries (maintaining high relative rates on low-value goods). We discuss these in turn.

3.1 A Brief History of U.S. Trade Negotiations, Post 1930

Before delving into the historical analysis, we provide a very brief overview of U.S. trade negotiations since 1930. Our analysis starts with the Tariff Act of 1930, more commonly known as the Smoot-Hawley Tariff. According to Irwin (2011), the Smoot-Hawley Act was one of the most "infamous pieces of congressional legislation of the twentieth century," as it raised tariffs in the United States to historic levels, and ushered in an era of global protectionism.[15] In 1934, Franklin Roosevelt signed the Reciprocal Trade Agreements Act, beginning what we refer to as the period of bilateral trade agreements. Between 1934 and 1939, the U.S. entered into trade agreements with 19 different countries.[16] A 1938 agreement signed during this period with the United Kingdom is of particular importance for this paper. In 1947, the GATT was signed, beginning the period of multilateral negotiations that still exists today—the GATT was the precursor to the modern day World Trade Organization. During the GATT, eight rounds of tariff negotiations were held between 1947 and 1994. During the first few rounds, negotiations occurred on a product-by-product basis, with the overarching goal of continuing to reduce tariffs on a global scale.[17] Starting in the mid-1960s, GATT negotiations became less "nitpicky," when it came to tariff reductions, instead

[15] Tariff rates under the Smoot-Hawley Tariff have been studied in great detail. A few recent examples include the work of Irwin and Soderbery (2021) and Mitchener et al. (Forthcoming).

[16] See `https://history.state.gov/milestones/1921-1936/export-import-bank` for more detail.

[17] `https://www.wto.org/english/docs_e/gattbilaterals_e/indexbyround_e.htm`

lowering tariff rates linearly on broad groups of goods. In addition to tariffs, negotiations focused on other aspects of the world trading system, including anti-dumping and development—much more akin to trade negotiations of today.[18]

3.2 Concessions and the Case of Fishing Reels

The first driver of regressivity that we uncover is that trade negotiations and subsequent tariff concessions in the decades following the Smoot-Hawley tariff tended to be made with advanced economies that produced higher end varieties. It is widely accepted that, especially in its early years, the GATT was somewhat of a "rich man's club." Many papers—for example, those by Jawara and Kwa (2004), Subramanian and Wei (2007), Bagwell and Staiger (2013)—have documented that developed countries were the dominant players in negotiations, while developing countries were largely on the sidelines. Negotiations occurred according to a "principal supplier rule," which dictated that agreements about tariff rates on a certain variety occur only with the principal supplier of that variety. Moreover, there was a sense of reciprocity in these negotiations—informal in some ways, but mandated by law in others[19]—such that countries would both ask for and grant concessions to trading partners. As a result, most of the "action" that occurred during the GATT rounds involved tariff reductions on goods supplied by developed countries.[20] Most developing countries were neither principal suppliers nor major importing markets, and so little was asked of them in terms of their own trade liberalization and the interests of their export markets were ill-represented (Bown, 2009). As an illustrative example, consider the following excerpt from the U.S. negotiating party at the Kennedy GATT round, which illustrates that even when developing countries were present at the negotiating table, it may have been difficult for their interests to be acknowledged due to differences in tariff nomenclature:

[18] https://www.wto.org/english/thewto_e/whatis_e/tif_e/fact4_e.htm

[19] According to Bown (2009), there is no article of the GATT 1947 that formally identifies reciprocity as a founding principle, however the articles that govern how countries are to renegotiate concessions (specifically, Articles XXVIII and XIX) if one party seeks to amend a bargain does contain language about reciprocity, suggesting that it played a role in how initial negotiations were carried out.

[20] And even more specifically, according to Bown and Irwin (2015), among a core group of GATT participants including the United States, United Kingdom, Canada, and Australia.

> Due to the lack of precision in descriptions of the products submitted, substantial difficulties have been experienced in identifying in the United States tariff nomenclature the corresponding articles which were actually intended to be designated by the less-developed countries (United States Tariff Commission, 1965).

The well-known result of these negotiation dynamics is that while tariffs were lowered substantially on a vast array of goods, trade barriers remained high in a number of markets that were of export interest to developing countries, like agriculture and clothing.[21]

Somewhat more surprising, however, is that that this pattern appears to hold at the good-level as well. Anecdotal evidence suggests that the United States made tariff concessions primarily on *varieties* that were of interest to negotiating partners. According to a report of the Industry Sector Advisory Committee, for example, about the Uruguay Round of tariff negotiations (well after the start of the GATT): "Since China was not a party to these negotiations, the inclination of U.S. negotiators was to avoid making tariff cuts on products if China would be the main beneficiary to prevent the free rider problem."[22] In other words, at the variety level, efforts to lower trade barriers were largely determined by bilateral negotiations with principal suppliers, leading to within-good variation on tariff rates that favored negotiating partners.

The history of tariff reductions on fishing reels is a prime example of a case where tariff rates were lowered on expensive varieties to appease important trading partners. As shown in Figure IV, the tariff rate on fishing reels valued over $2.70 and the tariff rate on fishing reels valued over $8.45 were the same until around 1940. In fact, until that point, these two varieties of fishing reels were not differentiated in the tariff schedule at all. The distinction between the high- and low-value fishing reels originated in the Anglo-American Trade Agreement of 1938. According to a detailed analysis of the agreement by the United States Tariff Commission (1938), at that time, U.S. manufacturers were dominant fishing reel producers. Imports of fishing reels into the United States were equivalent to less than one half of one percent of U.S. production. The small number of imports that did come in, were either high-quality reels from the United Kingdom or

[21] See, for example, Ludema and Mayda (2013).
[22] See United States International Trade Commission (1994).

medium- to low-grade reels from Japan and Germany. By creating a distinction in the tariff rates between high-quality reels (those valued above $8.45) and low-quality reels (those valued below $2.70)[23], the United States was able to appease the United Kingdom in negotiations—lowering import barriers for the type of fishing reel that the United Kingdom produced—without creating a threat to domestic producers.[24] That is stated in no uncertain terms in the U.S. Tariff Commission's 1939 Annual Report:

> It is noted in the report that a large number of the duty reductions relate to articles, imports of which consist of grades or qualities either not produced in the United States or produced only in small amounts. Furthermore, it is pointed out that many new import classifications are established by the agreement either for the purpose of confining concessions to products supplied principally by the United Kingdom, or in order to limit duty reductions to the less competitive portions of the old classifications. United States Tariff Commission (1939)

Further concessions were made to the United Kingdom on expensive fishing reels during the GATT negotiations in Geneva in 1947, and though there were subsequent rate reductions for both varieties of reels during later rounds of GATT negotiations, the rates on the high- and low-value varieties never again equalized.

Evidence from trade flows data supports the notion that GATT participants were more likely to export high-unit value varieties across the board. To see this, we use the global trade flow data of Feenstra (1996) to compute, for each country, the share of exported varieties that were high-value varieties in 1974.[25] We then compute the average value of this export share for all "core" GATT participant countries, and in all non-core GATT participant countries.[26] Table IV

[23] A third group was also created for reels in between $2.70 and $8.45.

[24] While the Anglo-American Trade Agreement of 1938 was a bilateral negotiation between the United States and the United Kingdom, the negotiated rates were actually applied as most-favored nation rates for both countries. For more on this treaty, and Cordell Hull's strong roll in pushing through this agreement as a harbinger of world peace, see Schatz (1970).

[25] Our sample uses trade flows in 1974 because this is the earliest year for which we have bilateral trade data for all countries. We define a "good" here according to 5-digit TSUS codes. As was described in the context of table III, that convention yields similar views on the presence of regressivity as our text-based approach.

[26] The list of "core" participants (Bown and Irwin, 2015) is Australia, Canada, United Kingdom, the EEC, and Japan.

shows the difference, demonstrating that the share of exports of all goods of above-median unit value varieties for core GATT participants was about 25 percentage points higher in 1974 relative to non-core GATT participants. In other words, the primary participants in GATT negotiations were more likely to be exporting—and therefore negotiating on behalf of—high-value varieties of goods.

3.3 Protection and the Cases of Forks and Bicycles

The other apparent driver of the divergence in tariff rates between high- and low-value varieties in the mid-twentieth century is an age-old story: Domestic industries lobbied for protection from cheap foreign imports. Article XIX of the GATT permitted contracting parties to escape GATT obligations and raise trade barriers to safeguard domestic producers that could prove serious injury would be caused by an increase in imports. In each round of GATT negotiations, a number of tariff lines were excluded from concessions for economic reasons, and in cases where the varieties in question were the low-value ones, regressivity emerged: Tariff rates on those varieties remained high, while negotiations lowered rates on the more expensive counterparts only.

This protectionist motive played a prominent role in the case of forks. Today, forks of stainless steel that are valued under 25 cents have a 15.8 percent tariff, while those that are plated in precious metal enter freely. Shown in Figure V, the divergence in these rates came about in the late 1950s. USITC (1982) provides a detailed description of the state of the stainless steel flatware (SSTF) industry during this period: At that time, there were 21 manufacturers of SSTF in the United States. Most of these domestic firms were producing flatware of the low-value variety—valued between 8 and 25 cents per piece. At the same time, there was a sharp increase in imports of SSTF, and most of these imports were of the low-value variety (valued around 14 cents per piece) coming from Japan. In search of protection from these cheap foreign imports, the domestic SSTF industry petitioned for, and received, protection under an escape clause tariff rate quota (TRQ) starting in 1959 for flatware valued under 25 cents per piece.[27] Since domestic production of precious-

[27]Under the TRQ arrangement, imports of SSTF valued at less than 25 cents each were charged the concessionary

metal-plated flatware was minor, the more expensive variety was not included in the escape clause protection. As a result, during the Kennedy Round of GATT negotiations, the tariff rate on cheap stainless steel forks was excluded from concessions, remaining just under 20 percent, while the rate on silver-plated forks was lowered. Further rate reductions for silver-plated forks occurred in subsequent GATT rounds, but the rate on cheap stainless steel forks is roughly the same today as it was 60 years ago.

There are other cases, like the fork industry, where domestic industries specialized in production of the low-value variety of a good, leading to the divergence between tariff rates on high- versus low-value varieties in the face of import competition. The bicycle industry, for example, also petitioned for escape clause protection following concessions that were granted to the United Kingdom in 1938 and later multilateral concessions agreed to in the 1947 Geneva round of the GATT. In 1955, tariff rates on the cheapest three of four varieties of bicycles were raised from 15 to 22.5 percent. The tariff rate on the fourth and most expensive variety—lightweight bicycles (weighing less than 16.3 kilograms) was increased from 7.5 percent to only 11.25 percent.[28] The lower rate for lightweight bicycles was justified by the fact that virtually all lightweight bicycles were imported and did not directly compete with the most popular domestic model—the balloon tire bicycle. Today the differentiation in rates remains. The two lightweight varieties of bicycles, which have average unit values of $200 to over $1000, have tariff rates of 5.5 percent or lower, while the rate on all other bicycle varieties that cost below $150 on average is 11 percent.

3.4 Summary: Regressivity Born from Policy Priorities of the Time

If the two apparent drivers of tariff regressivity outlined in this section are indeed the causal forces, it is notable that the current pattern of tariff rates originated in a vastly different economic landscape than the one that exists today. U.S. trading partners in the mid-1900s and the types of goods

tariff rate on the first 5.75 million dozen pieces imported. Above 5.75 million dozen pieces, imports were levied at a higher rate.

[28] According to USITC (1982), the U.S. Tariff Commission actually recommended a rate of 22.5 percent for lightweight bicycles as well, but President Eisenhower halved this recommendation.

that were imported from those partners have shifted dramatically over the last half-century, as has the composition of domestic industries. While concessions on high-quality fishing reels, for example, were made in the interest of the United Kingdom (and world peace, see footnote 24), in 2018 the U.K. accounted for less than 0.1 percent of U.S. imports of fishing reels valued over $8.45. For forks, despite continued TRQ protection and an increase in domestic demand for SSTF, the domestic SSTF industry has all but disappeared. A few domestic producers survived by diversifying production into higher-end flatware and other cookware, but today only one domestic manufacturer of SSTF remains: Sherrill Manufacturing (Liberty Tabletop). The retail price of a single stainless steel fork "Made in the USA" is $5.29.[29] There are no domestic producers left that are protected by the tariff on forks costing less than 25 cents per piece, yet the rate on those cheaper forks remains where it was in the early 1960s when the domestic industry was strong. In fact, tariff rates on many manufacturing industries were kept high during GATT negotiations, not to save domestic industries, but to cushion the blow of industries that were clearly already in decline. This was noted explicitly in the justification of the economic exception to tariff concessions given to the *Headwear of Fur Felt* industry during the Kennedy Round of the GATT:

> Production and employment have declined persistently over the past decade in this industry. Imports now account for half of the domestic market. The few remaining firms and employees should be given additional time to complete the process of adjustment and diversification now underway. (United States Tariff Commission, 1965)

Though for most goods tariff rates have declined since the early GATT rounds, in many cases the divergence between rates on low- and high-value varieties has never been corrected. Rates on many low-value products remain high, even if those domestic industries no longer exist.

In part, this is no surprise, as trade negotiations have become much more sophisticated over the years. As noted above, starting in the Kennedy Round of the GATT in the mid-1960s and continuing through the present day, trade agreement negotiations have been about more than just tariff

[29] See https://www.nytimes.com/2015/10/22/business/smallbusiness/setting-a-made-in-the-usa-table-yes-do-stick-a-fork-in-it.html for more on the state of the domestic flatware industry. Prices updated to 2022 from the Liberty Tabletop webstore.

rate reductions. Instead, modern day agreements focus on other important issues like provisions for intellectual property, environmental concerns, and labor protection. Moreover, given that firms, and not consumers, are the primary lobbying force for tariff rates, if there are no longer domestic firms in many of the industries in question in this analysis, it is not hard to believe that tariff rates on these products have been somewhat forgotten.

The next two sections are devoted to showing that the conclusions drawn from the case studies are indeed relevant when expanding the historical analysis in a more-systematic way. To that end, we bring in newly digitized data on legislated tariffs since the 1930 Smoot-Hawley act and perform several cuts of that data that support the claims from this section.

4 New Data on Legislated Tariff Rates

We systematically investigate the origins of the regressive pattern documented in Section 2 using newly digitized data on legislated tariff rates going back to the Smoot-Hawley Act of 1930. Our data on legislated tariffs come primarily from the tariff schedules published by the U.S. International Trade Commission (formerly the U.S. Tariff Commission, or TC).[30] We describe the documents in detail in Appendix A.3, but mention some highlights of the dataset in this section.

Our starting point is the tariff schedule that was legislated in the Smoot-Hawley Act of 1930.[31] Between 1930 and 1946 (the year of the first round of the GATT), the U.S. engaged in a slew of bilateral trade negotiations. All changes in tariff rates over this period were recorded in a document produced by the TC in 1946, in anticipation of the first GATT. Each rate change over this period contained a reference to the relevant trading partner, allowing us to systematically document the

[30] Aside from the 1930 document, these documents contain only legislated tariff rates and lack trade-flow data. Until 1946 the Commerce Department (or preceding agencies) published the *Foreign Commerce and Navigation of the United States*, where we get data on rates in 1930. These documents are incredibly informative—with U.S. imports by country, legislated rates, and collected duties—but their absence between 1946 and 1964 renders them of little help in analyzing major changes in tariff rates arising from GATT negotiations. Less detailed monthly reports were produced during this period.

[31] In this schedule, tariff rates were also accompanied by trade flow data, which allows us to appropriately address the role of specific tariffs. More on this in Section .

countries for which negotiations induced regressivity.[32]

We then collected legislated tariffs after each of the seven GATT rounds that concluded before 1989, when digitized tariff schedules become readily available.[33] Over this period, the bulk of changes in tariff rates that were made, occurred during GATT negotiations, so measuring changes at this frequency effectively allows us to make statements about when various changes occurred. In Appendix A.3, we show that the legislated rates that we have digitized match other published time series of effective rates of duty at the aggregate level fairly closely.

In Figure VI, we provide examples of pages of the digitized tariff schedules, for tariffs on fishing reels. All of the data contained on these pages, and pages like them, were manually entered by a data-processing company. In total, we digitized about 2,500 pages of legislated tariffs like the ones shown here. We parsed the rates of duty into specific and *ad valorem* components using natural language processing (NLP) techniques. For varieties whose verbal description contains a description of its unit value, we parse the descriptions using NLP techniques in order to separate high- and low-value varieties. This, alongside the import data present in the 1930 schedule, is used extensively in section 5.2. In section 5.3, we also make use of the "column 2" rate of duty which, for the most part, reflects each variety's 1930 rate of duty (in the case of fishing reels, 55 percent). Finally, we record the level of indentation of each variety, which is useful in locating sub-varieties (as discussed in section 2.1).

Additionally, we digitized just under 400 additional pages of concordances within and across classification systems, which aided in our ability to trace tariff rates of specific items back to, or forward from, 1930. These concordances are complete and detailed from 1963 forward (i.e., at the tariff-line level). For the period before 1963, the concordances are more crude, and require some manual concordance.

[32] We digitized the 1930 data in conjunction with Bouscasse (2022).

[33] These occurred in 1949 (Annecy), 1950 (Torquay), 1956 (Geneva), 1960 (Dillon), 1964, (Kennedy), and 1973 (Tokyo). The Uruguay round commenced in 1986, but did not end until after digitized tariff schedules are available.

5 Origins of Regressivity: Systematic Analysis

In this section, we broaden the scope of the case study analysis in Section 3 using our newly digitized data in order to show robust and systematic evidence of our main finding: regressivity began in the 1930s and 40s in response to policy priorities of the time, and has persisted through vast changes in the economic landscape.

We begin, in Section 5.1, by showing that the time series patterns shown for the case study goods hold for a broader panel of representative consumer goods. Using newly digitized data on bilateral trade flows, we highlight the hysteretic nature of rates on these goods—trade patterns have changed substantially since the period in which regressivity was introduced, but the relative rates between goods still reflect policy priorities of the 1930s and 40s. Next, in Section 5.2, we study a panel of goods whose rates were modified between 1930 and 1946, and reach two conclusions: First, the Smoot-Hawley Act rates did not exhibit the regressive pattern in a meaningful way. Second, the bilateral negotiations between 1930 and 1946 (particularly an agreement with the U.K.) introduced a substantial amount of regressivity. We perform these exercises using a panel of goods whose varieties are *defined* by their unit value, which is the most direct way to study tariffs on low- and high-value varieties. Finally, recalling that regressivity arises from within-good variation in rates, in Section 5.3, we turn to a cross-sectional approach that uses full tariff schedules, and show that within-good variation in rates spiked in the 1930s and 40s, and never fully returned to its 1930 level.

5.1 Hysteresis in A Long Panel of Consumer Goods

To broaden the scope of our historical analysis beyond fishing reels and forks, we use our newly digitized data to trace variety-level tariff rates back to 1930 for 13 additional goods (and their varieties). Our selection criteria for the panel of goods is based on the approach taken by Crucini (1994). Specifically, we begin by selecting the 27 chapters of the HTS that are comprised of at least

75 percent consumer goods by value.[34] We eliminate three of these chapters (HS 46, 66, and 92) because total imports in these chapters failed to surpass 0.1 percent of total imports in 2017. We eliminated five more chapters (49, 97, 83, 57, and 89), because they either contained no dutiable imports or they contained no regressive goods. In the remaining chapters, we selected the top regressive goods, where goods are ranked based on total imports in 2017. In a few cases, the top ranked good was not a good candidate for our analysis because it was not composed of obviously substitutable varieties, so we selected the next highest good in terms of its import ranking.

The time series of tariff rates for each variety within these 15 goods are plotted in Figure VII. While each good and variety has its own story, two general patterns emerge: First, divergences in tariff rates between low- and high-value goods tend to occur between 1930 and 1980; Second, tariff rates on most varieties are relatively stable after around 1990. These two patterns are illuminated in Figure VIII, which shows the average change in tariff rates relative to 1930 levels on the low- versus high-value varieties of our 15 goods. The divergence between average rates on the two types of varieties begins around 1938—the year of the Anglo-American Trade Agreement—and the divergence persists over time. At each major round of the GATT, tariff rates on all products are reduced, but regressivity is never eliminated. Furthermore, after the Uruguay round of the GATT ended in 1993, average tariff rates are remarkably stable.

One implication of the pattern we find—regressivity emerging in the mid-1900s due to strategic negotiations—is that unless tariff rates are constantly revisited *at the variety level*, tariff rates that may once have been set optimally to appease a trading partner may no longer be optimal if sourcing patterns have shifted over time. In other words, today's tariff rates (or, more precisely, the relative tariff rates among varieties of the same good) are functions of the economic landscape of the past, not the present. Returning to the 15 goods, we can see this shifting economic landscape quite clearly. The maps in Figure IX report the average share of imports for the 15 case study goods coming from each country. The top panels show these trade patterns in 1947—a year in the midst of when regressivity emerged for many of these goods. At the time, there were marked differences

[34] As before, the "consumer good" designation relies on the BEC classifications.

in the source countries for high- and low-value goods. Low-value goods came predominantly from Canada, while high-value goods had heavy concentrations coming from the United Kingdom, Italy, and Japan. The bottom two panels show import sources for the same low- and high-value varieties in 2017. Of course the most stark change over the 70 year period is that in the present day, the predominant share of *both* low and high unit value varieties comes from China. Moreover, while there are subtle differences in the import sourcing intensities among countries, the low- and high-value maps look remarkably similar to one another, in contrast to the 1947 versions.

5.2 The Introduction of Regressivity: 1930–1946

In our next exercise, we zoom in on the period between 1930 and 1946—where we believe regressivity was born—and study an even larger set of goods. The goods that we study in this section are what we call "valued" goods, or goods whose varieties are *defined* by their unit value. For example, fishing reels are taxed differently based on whether their unit values are above $8.45 each, below $2.70 each, or in between. This practice appears for the first time in the tariff of 1816,[35] and provides a set of goods with well defined low- and high-value varieties that allows us to circumvent some of the complications in our analysis described in Section 2. Within this subset of goods, there is no need to construct the definition of a "good," nor to use unit values to determine which varieties are low- or high-value.

We begin our systematic historical analysis by focusing on these valued goods in the Smoot-Hawley Tariff Act. At that time, during the second half of 1930, valued goods represented 4% of all dutiable goods imported into the United States. Our analysis of valued goods reveals two important facts about tariffs prior to the GATT (which began in 1947). First, we show that tariffs under Smoot-Hawley were not regressive (at least among this subset of goods), though they appear so due to the profuse use of specific tariffs.[36] Second, we show that the slew of bilateral U.S. tariff negotiations that occurred between 1930 and 1946 introduced an abundance of regressive

[35] See the tariffs on cotton products in the "Fourth" paragraph of the 1816 *Act to regulate the duties on imports and tonnage*.

[36] See Irwin (1998) for a discussion of the economic importance of specific vs. *ad valorem* tariffs.

changes, and much of the within good variation in tariff rates that exists today can be traced back to agreements made during that period.

5.2.1 Lack of Regressivity in the Smoot Hawley Tariff Act

While the Smoot-Hawley Act ushered in large increases in tariffs on many imported varieties, our analysis of the rates set on valued goods in the Act shows little evidence of the type of regressive pattern that we document above. There are 59 valued goods contained in the Act, whose legislated tariffs we parsed into their *ad valorem* and specific components, as described in Section 4.[37] Among these 59 goods, 55 contained specific tariffs—tariffs in the form of a specific dollar amount per unit imported (rather than a percent of value imported)—51 of which contained both specific and *ad valorem* components.

Figure X shows average tariff rates on the low- and high-value varieties of valued goods. The bars labeled "*ad valorem* equivalent" show that, relative to the average effective tariff rate for each good, low-value varieties had a 5% higher effective tariff, and high-value varieties had a 2% lower effective tariff. This finding suggests a pattern of regressivity, but indeed masks an important feature of tariffs at this time: Specific tariffs were pervasive. Why? Consider the case of belt buckles, one of the 59 valued goods in our sample. Belt buckles became a valued good in the tariff schedule in 1897, largely in response to calls from the domestic industry, such as the Alma Button Company of Baltimore, who testified in the tariff hearings ahead of the Committee on Ways and Means in 1896/7:

> If prices could be exactly determined nothing would seem to be fairer than an *ad valorem* duty. But unfortunately prices are very much matters of opinion, in which honest men may differ much and rogues much more. Inasmuch as the duty depends on the price, a cheat on the price is a cheat on the duty... *ad valorem* duties are mere inducements for fraud, and fail to attain the end desired. What is needed is a graduated

[37] To define valued goods, we start by parsing the descriptions of all varieties and keep those with the terms"valued" or "Valued" in the description. To group these varieties into "goods," we keep varieties that are listed sequentially and are at the same level of indentation.

specific duty.

These hearings ultimately culminated in a flat 15% *ad valorem* rate on each buckle, and specific tariffs of 5, 10, and 15 cents per 100 buckles on buckles valued below 15¢, between 15¢and 50¢, and above 50¢, respectively. This graduated schedule of rates was essentially a way to discourage the practice of under-reporting the value of imports for the purpose of circumventing tariffs: The effective *ad valorem* rate here is decreasing in price, converging to 15%.

Returning to Figure X, the bars labeled "*ad valorem* legislated" show that the *ad valorem* component of rates on these valued goods do not exhibit the regressive pattern. Instead, rates on low-value goods tend to be lower than rates on high-value goods, and are thus not the source of the regressive appearance of the first set of bars. Instead, the bars labeled "specific rate effective" are to blame. Those bars average the legislated specific rate as a percent of the average imported unit value of each variety. Like in the belt-buckle example, these rates are meant to dissuade under-reporting of prices and provide a minimum amount of tariff revenue per import object. To see this, in the final bars on the right of Figure X, we average the legislated specific tariff as a percent of the legislated unit-value cutoff. At the cutoffs, specific tariffs are (on average) uniform across varieties, i.e., not regressive.

5.2.2 Pre-GATT Bilateral Agreements: A Major Source of Regressivity

We turn next to the period between the Smoot-Hawley Act and the first round of GATT negotiations in Geneva, during which the U.S. took part in several bilateral trade negotiations. As discussed in detail by Irwin (2017), many of these agreements were at the urging of former Secretary of State Cordell Hull, who saw trade agreements and the reduction of tariffs as ways to foster international cooperation and peace. For the remainder of this section, we document that many of the tariff modifications made over this period were regressive in nature, with the majority of these regressive modifications coming from the 1938 bilateral agreement with the United Kingdom that was described in the case study on fishing reels in Section 3.2.

For this exercise, we use data on legislated tariff changes that took place over the period from

1930 to 1946 (see Section 4 for more detail). We again focus on valued goods, which we found by parsing the descriptions of each variety and searching for the term "valued." We then manually concorded these varieties back to their Smoot-Hawley rates and import values/quantities from 1930. In many cases, goods that were not valued goods in 1930, became so in the 1930-46 period, when new varieties were introduced. Thus, over the 1930-1946 period, the number of valued goods increased from 59 in 1930 to 105.

For each variety, we compute AVE tariffs using 1930 unit values (import quantity divided by import value).[38] We then compare these 1930 rates to new rates that were established between 1930 and 1946. In our analysis here, when a good is split into several bins by unit value of its varieties, we retain only the top and bottom bin. Figure XI presents the data in several formats. Panel (a) contains a scatter plot of a variety's 1930 tariff rates on the x-axis, plotted against its new rate established over the 1930-1946 period on the y-axis. Unsurprisingly, almost all of the modifications that were made are decreases in tariffs, and many were substantial, consistent with the findings of Bown and Irwin (2016).[39] Panel (b) confirms that the cuts were substantial, and, more importantly, shows that reductions mostly occurred among high-value goods. The average decrease in tariff rates for high-value varieties was just under 25 percentage points, while the decrease for low-value varieties was only about 2 percentage points. Panel (c) presents simple counts of the number of reductions that were made on high-value and low-value varieties. This confirms what can be seen by visual inspection of the scatter plot: Most of the reductions that were made were made on the high-value goods in the trade agreement with the U.K.

5.3 Within-Good Tariff Variation Post 1946

Putting regressivity aside momentarily, our case studies suggest that general variation in tariff rates *within goods* emerged in the mid-1900s and has persisted over time. We test for this pattern across

[38] That is, we sum the *ad valorem* component of each variety's tariff with the quotient of the specific rate and the unit value.

[39] Bown and Irwin (2016) find that tariff rates had come down substantially from Smoot-Hawley levels *prior* to the beginning of the GATT.

the entirety of the tariff code using digitized tariff schedules from eight years between 1946 and 1980.[40] Specifically, we decompose the variance of tariff rates across the tariff schedule into two components: within-good variation (across varieties of the same good) and across-good variation:[41]

$$\text{var}(\tau_{ig,t}) = \frac{1}{N}\sum_{g\in G}\sum_{i\in g}(\tau_{ig,t}-\bar{\tau}_t)^2 = \underbrace{\frac{1}{N}\sum_{g\in G}\sum_{i\in g}(\tau_{g,t}-\bar{\tau}_t)^2}_{\text{across}} + \underbrace{\frac{1}{N}\sum_{g\in G}\sum_{i\in g}(\tau_{ig,t}-\bar{\tau}_{g,t})^2}_{\text{within}}, \quad (1)$$

where i indexes varieties, g indexes goods, and $N = \sum_{g\in G}|g|$. We perform this decomposition for each year t for which we have a digitized schedule, and compare the relative within-good variation share in year t to the within-good variation share in 1930. To perform the 1930 decomposition, we leverage the fact that the 1930 rates for each variety are reported in each year's tariff schedule as the column 2 rate of duty.[42] This allows us to compute the decompositions in each year relative to 1930, without needing to crosswalk tariff lines between that year and 1930.

The results are shown in Figure XII. Between 1930 and 1946, the within-good share of variance nearly triples, consistent with our finding that the variation within goods emerged in these early post-Smoot-Hawley trade negotiations. The within-good share of variation declines between 1952 and 1958, and then settles at around 1.5 times its 1930 levels in 1963, where it remains. While this exercise does not tell us about regressivity, it does confirm that the pre-GATT bilateral agreement period and the early GATT years were times when tariff negotiations led to changes in tariff rates among varieties of the same good, which is consistent with our analysis from case studies and small panels of goods.

[40] The years we use are 1946, 1950, 1952, 1958, 1963, 1968, 1972, and 1980.

[41] "Goods" here, before 1963, are tariff paragraphs. After 1963, we use 5-digit TSUS codes.

[42] The U.S. tariff sched ule has two main columns. Column 1 reports the MFN tariff rate, and column 2 reports the rates for those countries that do not have normal trade relations status with the United States, which is also almost always the 1930 rate of duty.

6 Economic Significance

In addition to providing a window into the hysteretic nature of tariff policy, tariff regressivity has direct aggregate and distributional implications. In Section 6.1, we consider the aggregate implications of the regressive pattern by computing the loss in tariff revenue that would accrue from eliminating the pattern. We then consider the distributional consequences of the pattern in Section 6.2. There, we present a reduced-form exercise using the sufficient statistics approach from Borusyak and Jaravel (2021) and regional trade data to show that regressivity amplifies the pro-poor effects of trade liberalization.

6.1 Aggregate Implications

As discussed in Section 2.3, the economic relevance of the regressive pattern hinges on current consumption habits. In this section, we ask whether U.S. consumers are meaningfully taxed more heavily on their consumption of low-value goods. To that end, we compare tariff revenues collected with current MFN AVE rates to an alternative set of tariff revenues that would be collected if the regressive pattern were eliminated. To do this, we construct an alternative tariff schedule, where within regressive goods we replace the tariff on low-value varieties with the average tariff on high-value varieties. Put differently, assuming that tariffs are fully passed-through into consumer prices and holding quantities imported fixed, this number represents the amount that consumers would save each year from a reduced tax bill if regressivity were eliminated—an approximation to the loss in consumer surplus from the existence of the pattern. The exercise is an import-weighted representation of Figure II.[43]

Figure XIII presents the results. Under the alternative—non-regressive—tariff schedule, consumers would save nearly $5 billion per year. If the change were implemented for LTCGs only, the savings would be about $3 billion, or about 1.5% of imports of LTCGs. These savings are substan-

[43]To see this, suppose that each good g has a single low- and high-value variety, indexed by ℓ and h. This graph shows the revenue loss $\sum_g \sum_{v\in\{\ell,h\}}(\tau_v - \tilde{\tau}_v)m_v$, where $\tilde{\tau}_h = \tau_h$ and $\tilde{\tau}_\ell = \tau_h$ are the counterfactual tariff rates. The revenue loss is therefore $\sum_g(\tau_\ell - \tau_h)m_\ell$, or an import-weighted version of the "tariff divergence" measure.

tial, representing nearly 20% of total revenue collected on LTCGs. The aggregate figures mask an important aspect of this back-of-the-envelope calculation: The gains from eliminating regressivity in the tariff code would likely not be distributed equally, to the extent that lower-income consumers are more likely to purchase the low-value high-tariff varieties. In the next subsection, we discuss the distributional consequences of the regressive pattern.

6.2 Distributional Implications: Sufficient Statistic Calculation

Borusyak and Jaravel (2021) show that import shares in consumer expenditure are sufficient statistics for estimating the welfare effects of trade shocks. Specifically, they show that the welfare effect for an individual with income i of a reduction in iceberg trade cost on variety ω is given by:

$$\partial \log W_i = \sum_{\omega} s_{\omega}^{i} \times -\partial \log \tau_{\omega} \tag{2}$$

where s_{ω}^{i} is the share of individual i's expenditures spent on imported variety ω.[44] We estimate equation (2) using district-level import data for counterfactual reductions in variety-level tariff rates. The data and calculations are described in more detail below.

6.2.1 Data

To estimate equation (2), we need data on the expenditure shares of imported variety ω in each income quantile i. We do not directly observe these values, but we can estimate them using regional data on imports and regional data on income and expenditures. For imports, we rely on customs data on variety-level imports by Customs district in 2017. Following Riker (2013), we aggregate districts into 27 import regions such that each region contains at least one customs district and at least one state.[45] District-level import data has its limitations, so we admit that these estimates must

[44] Borusyak and Jaravel (2021) have a more complex formula that also takes input-output relationships into account, which we abstract from here.

[45] As in Riker (2013), districts are combined such that regions combine customs districts that have ports in the same state (e.g., Miami and Tampa are in the Florida region), and they also combine states that have ports in the same customs district (e.g., the Maine district includes ports in both Maine and New Hampshire).

be taken with caution. In particular, the import data do not directly identify the location of the final consumer of the imports, but rather the point of entry into the United States from the exporting country. Riker (2013) shows that imports do tend to benefit consumers within the region where they clear customs, so we are cautiously optimistic that these data give us a reasonable proxy for regional import consumption.

We merge the import data at the state level (recall that each import region contains at least one state) with income data from the Current Population Survey's 2017 Annual Social and Economic Supplement. We then compute the median income of each region. In our analysis below, we will treat each region as being composed of a representative consumer with income given by that region's median income, y_i. We normalize each region's imports so that each region spends 20% (the average value across regions) of its income on imports. Thus, our identification of welfare effects comes from the allocation of spending across imported varieties, rather than between imported and non-imported varieties. To have a sense of whether this treatment of the data provides a sensible approximation of expenditure habits by income, we estimate

$$s_\omega^i = \beta \left[\ell_i \times \mathbf{1}\{p_\omega > \bar{p}_{g(\omega)}\} \right] + \delta_{g(\omega)} + e_{i,\omega} \tag{3}$$

where s_ω^i is region i's imports of variety ω divided by total income in region i, ℓ_i is the percent of the region's population that makes below \$20,000 per year, $\mathbf{1}\{p_\omega > \bar{p}_{g(\omega)}\}$ is an indicator for whether variety ω has a unit value above its good's median unit value, and $\delta_{g(\omega)}$ is a fixed effect for variety ω's good. The results are displayed in table V. For interpretability, we divide s_ω^i by its average value of 0.000009. While not terribly statistically significant, the negative estimate of β indicates that as the low-income share increases, relatively less is spent on high-value varieties. Increasing the low-income share by one percentage point decreases the share of income spent on high-valued varieties by 3% (recall, over a base of 0.000009).

6.2.2 Estimation

Given actual (gross) MFN *ad valorem* tariff rates, $\{\tau_\omega\}$, we consider the welfare effect of switching to two alternative tariff schedules, $\{\tau_\omega^c\}$. Before describing the alternative schedules, we discuss the procedure for calculating welfare gains over the income distribution using the regional-level import data and equation (2). For each region i, we estimate $\partial \log W_i$ using equation (2), log changes in tariffs $\{\log(\tau_\omega^c) - \log(\tau_\omega^c)\}$, and region i's imports of ω divided by total income in i, s_ω^i. We then fit an exponential curve to the relationship between the welfare effect $\partial \log W_i$ and median income y_i in each region, and report the fitted curve.[46]

The first alternative tariff schedule we consider is one in which tariff rates are reduced across the board by 5 percentage points. We call this alternative the "uniform reduction" schedule and index it by U. The associated tariff schedule has $\tau_\omega^{\text{U}} = \min\{\tau_\omega - 0.05, 0\}$ for each ω. This alternative scenario reduces collected duties by 4.4%. The second alternative schedule, which we call the "eliminate regressivity" scenario and index by ER, asks how the distribution of welfare gains would change if, in addition to the uniform reduction, tariffs on low-value varieties, ω, that fit the regressive pattern were set to the average tariff on the high-value varieties of the same good (within $g(\omega)$). The alternative tariff rates under this scenario are computed as:

$$\tau_\omega^{\text{ER}} = \begin{cases} \min\{\bar{\tau}_g(\omega) - 0.05, 0\} & \text{if } p_\omega < \bar{p}_{g(\omega)} \\ \min\{\tau_\omega - 0.05, 0\} & \text{if } p_\omega \geq \bar{p}_{g(\omega)}, \end{cases}$$

where $\bar{p}_{g(\omega)}$ is the median unit value of varieties in good $g(\omega)$, and $\bar{\tau}_g(\omega)$ is the average AVE tariff rate on varieties with unit values above $\bar{p}_{g(\omega)}$.

The results of our estimation are shown in Figure XIV. When calculated changes in welfare if tariff changes are made on all imported varieties, the gain for a consumer with 2017 median U.S. income of $30,100 is 0.18 percent under the uniform reduction scenario, and 0.22% when regressivity is also eliminated. This is at the low end of the range reported by Fajgelbaum and

[46] An exponential curve fits the data better than a linear one.

Khandelwal (2016), who estimate that a 5 percent decrease in tariffs on manufacturing imports increases the welfare of the representative consumer by between 0.2 and 1.3 percent. Among LTCGs, the welfare gain for a uniform 5 percentage point reduction is 0.036%, and this increases to 0.054% when we additionally eliminate regressivity. Figure XIV shows, however, that welfare gains are not evenly distributed: Consumers at the low end of the distribution see much larger welfare increases than consumers at the top of the income distribution, and this difference becomes especially pronounced in the counterfactual that eliminates regressivity. In other words, the regressive pattern alone has distributional implications.

7 Conclusion

In this paper, we document a surprising feature of the U.S. tariff code: Tariffs are systematically higher on low-value versions of goods relative to their high-value counterparts. We show that this regressive pattern is pervasive across the tariff code, and is not a new phenomenon. Using newly digitized data on legislated tariffs dating back to the 1930 Smoot-Hawley Tariff Act, we show that many regressive goods were born in the 1930s and 40s, and though average tariff rates came down over time, relative rates within goods persisted. Our historical analysis helps to put previous findings on the endogeneity of import classification systems into a dynamic setting: Not only is classification endogenous, but classification and therefore tariff rates can be hysteretic as well. Due to the sheer magnitude and complexity of the tariff schedule, classification and tariff rate decisions are not necessarily revisited or re-optimized in each period, but can persist even as the economic landscape shifts, leaving us with a set of tariff rates that reflect policy objectives of a bygone era. Lastly, we show that while regressive tariffs may have emerged almost a century ago, they have modern-day impacts: Their presence substantially alters the implied distributional gains from trade.

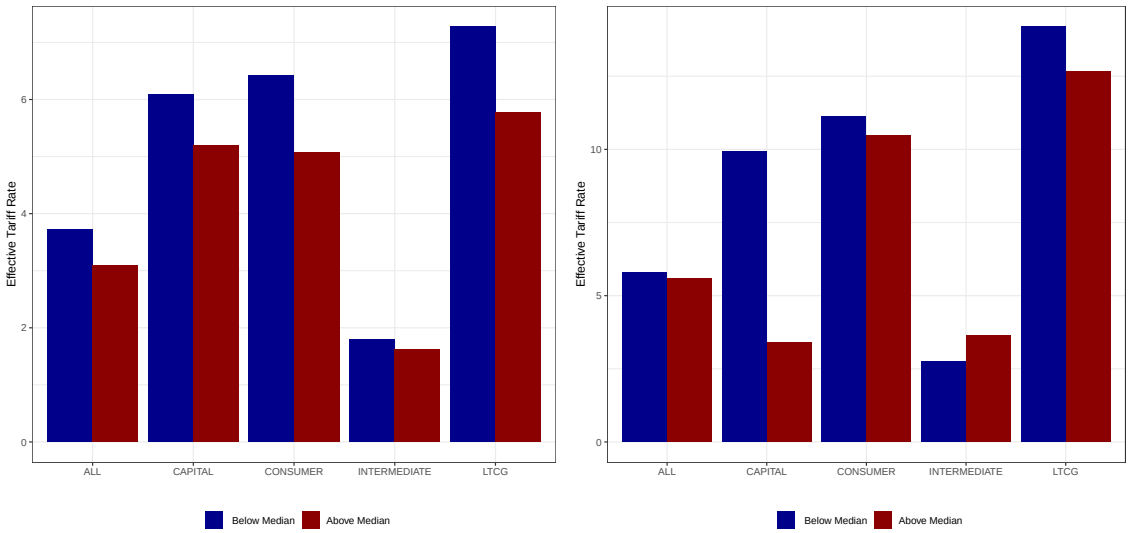
A Appendix

A.1 Weighted Statistics

This appendix represents the average AVE MFN tariff on low- and high-value varieties, weighted by each variety's (left) or good's (right) import share. Goods are split by median unit-value, as in the baseline. The results are similar to the unweighted average differences, presented as the baseline estimates in the paper.

FIGURE A.I
Tariff Differentials Under Different Weighting Schemes

(a) Variety Weighting (b) Good Weighting



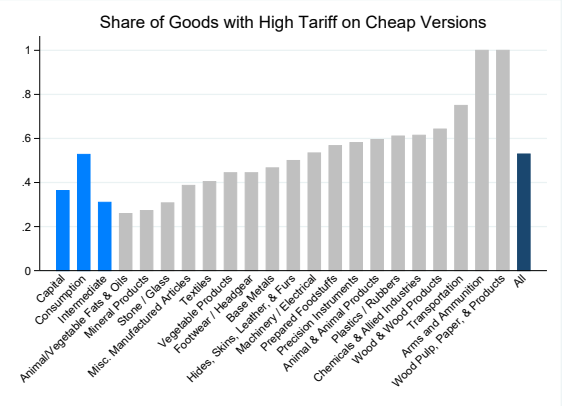
NOTE. The figures above show the average AVE MFN tariff rate on low- and high- unit value varieties when we weight by each variety's (left) or good's (right) import share.

A.2 Regressivity in the European Tariff Schedule

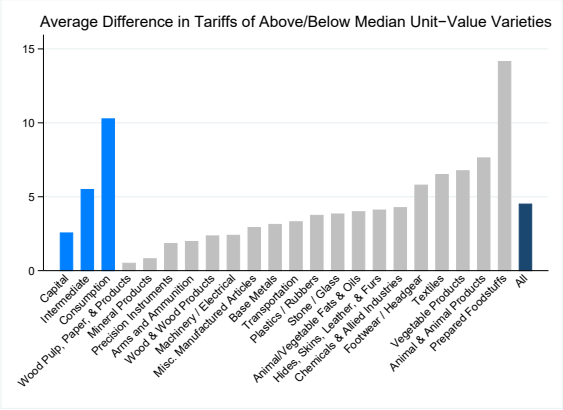
This appendix shows the analogue of our main U.S. figures using the 2017 EU tariff schedule. The panel on the left shows the fraction of regressive goods within the full, and various subsets of the EU tariff schedule. We define a "good" as an HS5/unit of quantity pair, and restrict our analysis to only *ad valorem* rates of duty (the more conservative approach to checking for regressivity). The panel on the right shows the tariff differential among varieties of regressive goods.

FIGURE A.II
Presence of Regressivity in the EU Tariff Schedule

(a) Share of Regressive Goods



(b) Tariff Differentials



NOTE. In the figures above, we replicate our baseline analysis (Figure I for legislated tariffs in the European Union (EU). The left panel shows the fraction of regressive goods within different product categories. The right panel shows the tariff differentials.

A.3 Details on Digitized Tariff Data

This appendix describes the data sources used to form our new dataset of legislated tariff rates. Table A.I shows the list of documents that we digitized. The first document, *Foreign Commerce and Navigation of the U.S.*, provides tariff rates immediately before and after the Smoot-Hawley Act. All legislated tariff changes between 1931 and 1946 were included in the first edition of the Tariff Commission's *United States Import Duties* (USID). Between 1946 and 1958 we gathered the annual USID after each round of GATT negotiations (except the first Geneva round). The year 1963 witnessed a major overhaul of the tariff schedule, which culminated in the creation of the *Tariff Schedules of the United States* (TSUS). We digitized the TSUS in the year following each GATT round from 1963 through 1987 (Dillon, Kennedy, and Tokyo). The year 1989 saw another major overhaul of the import classification, with the establishment of the Harmonized Tariff Schedule (HTS). Starting at this point, digitized tariff schedules are readily available.

TABLE A.I
Data Sources

Year	Publication Name	Event
1930	*Foreign Commerce and Navigation of the U.S.*	Pre- and Post-Smoot Hawley
1931–1946	*United States Import Duties*	Pre-Geneva I
1948	*United States Import Duties*	Post-Geneva I
1950	*United States Import Duties*	Post-Annecy
1952	*United States Import Duties*	Post-Torquay
1958	*United States Import Duties*	Post-Geneva II
1963	*Tariff Schedules of the U.S.*	Post-Dillon
1968–1972	*Tariff Schedules of the U.S.*	Post-Kennedy
1980–1987	*History of the Tariff Schedules of the U.S.*	Post-Tokyo

NOTE. The post-Kennedy and post-Tokyo documents contain MFN and column-2 rates of duty for the first year in the range, and staged MFN rates for the following years.

Some of our analysis (namely, in section 3) requires us to trace tariff rates on particular products over time. To assist in that analysis, we also digitized several concordances between 1930 and 1988, and relied on the digitized concordances of other authors to cover the period since 1988. To concord tariff lines in the *Foreign Commerce* (see table A.I) to their corresponding "paragraph numbers" used in the USID (1930–1963), we use the 1930 *Statistical Classification of Imports into*

the United States.[47] Varieties tended to stay within tariff paragraphs over the USID period, so the concordance of goods from 1930–1963 is straightforward. To concord these paragraph numbers to their corresponding TSUS (1963–1988) numbers, we use of the crosswalk put together by the Tariff Commission in its 1960 *Tariff Classification Study*.[48] To concord items in the TSUS from 1963 through 1988, we use the *History of the Tariff Schedules* (see table A.I). To concord TSUS items to their HTS codes (1989–present), we use the concordance digitized by Feenstra (1996). Finally, to concord HTS items since 1989, we use the digitized concordance of Feenstra et al. (2002).

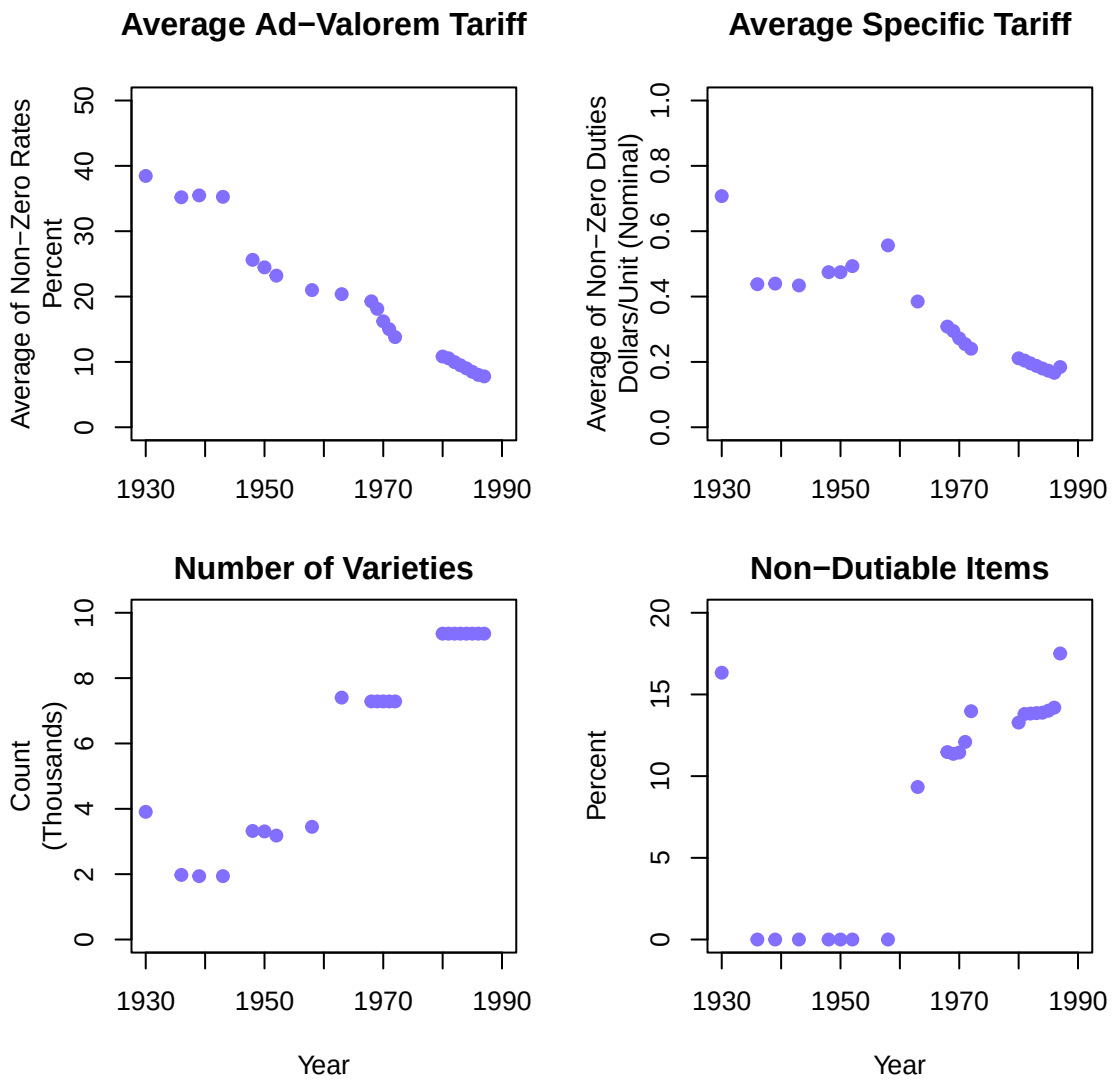
We end the description of the data with some summary statistics regarding legislated U.S. tariffs, shown in Figure A.III. The top panels, show the (simple) average *ad valorem* and specific tariff on all dutiable items in each schedule. Despite not being trade-weighted, the patterns generally line up with trade-weighted average tariffs among dutiable items.[49] Our data do not cover the full breadth of non-dutiable imported items, though that is irrelevant for our analysis below.

[47] To measure the full tariff schedule between 1930 and 1946, we carried the *Foreign Commerce* forward, updating it manually with the 1946 USID, guided by the *Statistical Classification*.

[48] Congress directed Tariff Commission (TC) to simplify tariff schedules and bring them up to date in the 1953 *Customs Simplification Act*. That process culminated in the 1960 report, which (after a few modifications) took effect with the 1962 *Tariff Classification Act*.

[49] See, e.g., https://www.usitc.gov/documents/dataweb/ave_table_1891_2016.pdf.

FIGURE A.III
Legislated Tariffs: Summary Statistics



NOTE. This figure shows summary statistics for the tariff schedules that we use in our historical analysis. The top two panels show the (simple) average tariff rates among varieties with non-zero tariffs. The bottom-left panel shows the number of varieties in each schedule, and the bottom-right panel shows the percent of varieties that have a non-zero tariff.

References

Bagwell, Kyle and Robert W Staiger, "Can the Doha round be a development round? Setting a place at the table," in "Globalization in an age of crisis: Multilateral economic cooperation in the twenty-first century," University of Chicago Press, 2013, pp. 91–124.

_ , _ , and Ali Yurukoglu, "Multilateral trade bargaining: A first look at the GATT bargaining records," *American Economic Journal: Applied Economics*, 2020, *12* (3), 72–105.

_ , _ et al., "The Economics of the World Trading System," *MIT Press Books*, 2002, *1*.

Borusyak, Kirill and Xavier Jaravel, "The Distributional Effects of Trade: Theory and Evidence from the United States," Working Paper 2021.

Bouscasse, Paul, "Canst Thou Beggar Thy Neighbour? Evidence from the 1930s," Working Paper 2022.

Bown, Chad P., *Self-Enforcing Trade: Developing Countries and WTO Dispute Settlement*, Brookings Institution Press, 2009.

Bown, Chad P and Douglas A Irwin, "The GATT's Starting Point: Tariff Levels circa 1947," Technical Report, National Bureau of Economic Research 2015.

_ and _ , *The GATT's Starting Point: Tariff Levels Circa 1947*, The World Bank, 2016.

Brossard, E. B., "Comparison of Rates of Duty in the Pending Tariff Bill of 1929 with the Tariff Act of 1913 and the Tariff Act of 1922: Letter from USTC Chairman Brossard to Senator Reed Smoot," Mar 1930.

Crucini, Mario J, "Sources of variation in real tariff rates: The United States, 1900-1940," *The American Economic Review*, 1994, *84* (3), 732–743.

Fajgelbaum, Pablo D and Amit K Khandelwal, "Measuring the unequal gains from trade," *The Quarterly Journal of Economics*, 2016, *131* (3), 1113–1180.

Feenstra, Robert C, "US imports, 1972-1994: Data and concordances," Technical Report, National Bureau of Economic Research 1996.

_ , John Romalis, and Peter K Schott, "U.S. Imports, Exports, and Tariff Data, 1989-2001," Working Paper 9387, National Bureau of Economic Research December 2002.

Furman, Jason, Kathryn Russ, and Jay Shambaugh, "US tariffs are an arbitrary and regressive tax," *VoxEU. org (Center for Economic and Policy Research blog). http://voxeu. org/article/us-tariffs-are-arbitrary-and-regressive-tax (January 15, 2017)*, 2017.

Gowa, Joanne and Raymond Hicks, ""Big" Treaties, Small Effects: The RTAA Agreements," *World Politics*, 2018, *70* (2), 165–193.

Grant, Matthew, "Where do the Data Come From? Endogenous Classification in Administrative Data," 2021.

Gresser, Edward, "Toughest on the Poor: America's Flawed Tariff System," *Foreign Affairs*, 2003, *81* (6), 9–14.

Grossman, Gene M and Alan O Sykes, "A preference for development: the law and economics of GSP," *World Trade Review*, 2005, *4* (1), 41–67.

Gulotty, Robert, "Mismeasured Cooperation: The Trans-Atlantic Origins of Reciprocity in Market Access," 2018.

He, Zheli, "Trade and Real Wages of the Rich and Poor: Cross-Region Evidence," 2018.

Hottman, Colin J and Ryan Monarch, "A matter of taste: Estimating import price inflation across US income groups," *Journal of International Economics*, 2020, *127*, 103382.

Irwin, Douglas A, "The Smoot-Hawley tariff: A quantitative assessment," *Review of Economics and statistics*, 1998, *80* (2), 326–334.

_ , *Peddling Protectionism*, Princeton University Press, 2011.

_ , *Clashing Over Commerce*, University of Chicago Press, 2017.

_ **and Anson Soderbery**, "Optimal tariffs and trade policy formation: US evidence from the Smoot-Hawley era," Technical Report, National Bureau of Economic Research 2021.

Jawara, Fatoumata and Aileen Kwa, *Behind the scenes at the WTO: the real world of international trade negotiations*, Zed Books, 2004.

Ludema, Rodney D and Anna Maria Mayda, "Do countries free ride on MFN?," *Journal of international Economics*, 2009, *77* (2), 137–150.

_ **and** _ , "Do terms-of-trade effects matter for trade agreements? Theory and evidence from WTO countries," *The Quarterly Journal of Economics*, 2013, *128* (4), 1837–1893.

Marcus, Mitchell, Grace Kim, Mary Ann Marcinkiewicz, Robert MacIntyre, Ann Bies, Mark Ferguson, Karen Katz, and Britta Schasberger, "The Penn Treebank: Annotating Predicate Argument Structure," in "Proceedings of the workshop on Human Language Technology" Association for Computational Linguistics 1994, pp. 114–119.

Mitchener, Kris James, Kirsten Wandschneider, and Kevin Hjortshøj O'Rourke, "The Smoot-Hawley Trade War," Forthcoming.

Nunn, Nathan, "Rethinking economic development," *Canadian Journal of Economics/Revue canadienne d'économique*, 2019, *52* (4), 1349–1373.

Özden, Çaglar and Eric Reinhardt, "The perversity of preferences: GSP and developing country trade policies, 1976–2000," *Journal of Development Economics*, 2005, *78* (1), 1–21.

Riker, David, "Geographically Disaggregated Import Data and Consumer Gains from Trade," *J. Int'l Com. & Econ.*, 2013, *5*, 65.

Schatz, Arthur W, "The Anglo-American Trade Agreement and Cordell Hull's Search for Peace 1936-1938," *The Journal of American History*, 1970, *57* (1), 85–103.

Schott, Peter K, "The relative sophistication of Chinese exports," *Economic Policy*, 2008, *23* (53), 6–49.

Subramanian, Arvind and Shang-Jin Wei, "The WTO promotes trade, strongly but unevenly," *Journal of international Economics*, 2007, *72* (1), 151–175.

Tavares, Samia Costa, "The political economy of the European customs classification," *Public Choice*, 2006, *129* (1), 107–130.

United Nations, "Classification by Broad Economic Categories," Statistal Paper, Statistics Division, Department of Economic and Social Affairs 2002.

United States International Trade Commission, *Potential impact on the U.S. economy and industries of the GATT Uruguay Round Agreements*, Vol. 1, U.S. International Trade Commission, 1994.

United States Tariff Commission, *Trade Agreement Between the United States and the United Kingdom* 1938.

_ , *Twenty-third Annual Report of The United States Tariff Commission* 1939.

_ , "Contribution of the United States to the Trade Negotiations under the Kennedy Round 1964-67 (Part III of III)," *GATT Bilateral Negotiating Material by Round (https://www.wto.org/english/docs_e/gattbilaterals_e/indexbyround_e.htm)*, 1965.

USITC, "The effectiveness of escape clause relief in promoting adjustment to import competition," *USITC publication*, 1982, *1229*, 332–115.

B Tables

TABLE I
2019 HTS: All Varieties with HTS Code 8215

HTS Code	Description	Noun Grouping
8215	Spoons, forks, ladles, skimmers, cake-servers, fish-knives, butter-knives, sugar tongs and similar kitchen or tableware; and base metal parts thereof:	
8215.10.00.00	Sets of assorted articles containing at least one article plated with precious metal	sets
8215.20.00.00	Other sets of assorted articles	sets
	Other:	
8215.91	Plated with precious metal:	
8215.91.30.00	Forks	forks
8215.91.60.00	Spoons and ladles	spoons
8215.91.90.00	Other (including parts)	–
8215.99	Other:	
	Forks:	
	With stainless steel handles:	
	With handles containing nickel or containing over 10 percent by weight of manganese:	
8215.99.01.00	Valued under 25¢ each, not over 25.9 cm in overall length	forks
8215.99.05.00	Other	forks
	Other:	
8215.99.10.00	Valued under 25¢; each	forks
8215.99.15.00	Other	forks
8215.99.20.00	With rubber or plastic handles	forks
	Other:	
8215.99.22.00	Without their handles	forks
	Other:	
8215.99.24.00	Table forks (including table serving forks) and barbecue forks with wooden handles	table forks
8215.99.26.00	Other	table forks
	Spoons and ladles:	
	With stainless steel handles:	
8215.99.30.00	Spoons valued under 25¢each	spoons
8215.99.35.00	Other	spoons
8215.99.40	With base metal (except stainless steel) or nonmetal handles	–
8215.99.40.30	Tablespoons and table ladles	tablespoons
8215.99.40.60	Other	tablespoons
8215.99.45.00	Other	–
8215.99.50.00	Other (including parts)	–

NOTE. This table presents an example of the layout of the HTS in 2019. The indentations replicate what is in the HTS, and the column "Noun Grouping" shows the relevant noun (or pair of nouns) that define the several goods within the HS-4 8215—see the text for more details.

TABLE II
Good-Level Summary Statistics

	All	Consumer	Intermediate	Capital	Other	Low-Tech. Consumer
Number of Goods	2,987	956	1,649	387	46	474
Number of Varieties	12,487	4,649	6,428	1,222	188	3,030
Imports ($, billions)	1,334	339	543	306	147	209
Import-weighted Tariff	0.019	0.051	0.010	0.004	0.009	0.076
Dutiable Fraction (by count)	0.644	0.689	0.660	0.457	0.391	0.827
Dutiable Fraction (by imports)	0.549	0.620	0.571	0.286	0.847	0.699
Fraction with ≤ 2 varieties	0.523	0.456	0.560	0.584	0.652	0.340
≤ 4 varieties	0.779	0.722	0.800	0.860	0.826	0.584
≤ 10 varieties	0.934	0.903	0.945	0.982	0.935	0.831

NOTE. This table presents summary statistics for different slices of the 2017 U.S. tariff schedule. See the text for details on the sample selection.

TABLE III
Establishing the Pattern: Robustness

	All	Low-Tech Consumer	Capital	Consumption	Intermediate
Share Regressive					
Average	0.60	0.71	0.67	0.71	0.47
(s.e.)	(0.01)	(0.01)	(0.03)	(0.01)	(0.01)
Quartile Split					
Average	0.60	0.71	0.66	0.71	0.47
(s.e.)	(0.01)	(0.01)	(0.03)	(0.01)	(0.01)
HS5 Goods					
Average	0.6	0.80	0.54	0.75	0.47
(s.e.)	(0.0)	(0.01)	(0.02)	(0.01)	(0.01)
Ad Valorem Only					
Average	0.56	0.70	0.65	0.66	0.44
(s.e.)	(0.01)	(0.01)	(0.03)	(0.01)	(0.01)
Origin-Adjusted Prices					
Average	0.56	0.66	0.67	0.64	0.46
(s.e.)	(0.01)	(0.01)	(0.03)	(0.01)	(0.01)
Tariff Differential					
Average	0.41	1.24	0.30	1.07	0.03
(s.e.)	(0.11)	(0.28)	(0.15)	(0.26)	(0.13)
Only Regressive					
Average	3.99	5.30	2.7	5.00	3.40
(s.e.)	(0.20)	(0.36)	(0.4)	(0.35)	(0.25)
Quartile Split					
Average	0.54	1.45	0.28	1.49	0.00
(s.e.)	(0.13)	(0.33)	(0.15)	(0.30)	(0.12)
Ad Valorem Only					
Average	0.16	1.11	0.24	0.53	−0.08
(s.e.)	(0.10)	(0.28)	(0.15)	(0.22)	(0.12)
Effective Rates					
Average	0.34	1.29	0.31	0.94	0.00
(s.e.)	(0.09)	(0.26)	(0.15)	(0.18)	(0.11)
Origin-Adjusted Prices					
Average	1.32	1.90	0.64	2.04	0.81
(s.e.)	(0.23)	(0.49)	(0.38)	(0.48)	(0.28)
Unit-Value Tariff Correlation					
Average	−0.09	−0.16	−0.09	−0.19	−0.01
(s.e.)	(0.02)	(0.04)	(0.09)	(0.03)	(0.03)
Only Regressive					
Average	−0.72	−0.56	−0.70	−0.66	−0.76
(s.e.)	(0.01)	(0.03)	(0.06)	(0.02)	(0.02)

NOTE. The table reports averages over different categories of products (across columns) of the different statistics and subsamples described in the text (rows). The "tariff differential" figures are in percentage points. Heteroskedasticity-robust standard errors are reported in parentheses.

TABLE IV
GATT Participant and Concentration of High-Value Exports (1974)

	(1) Above-Median Unit Value Export Share	(2) Above-Median Unit Value Export Share
GATT Participant	0.230***	0.271**
	(0.052)	(0.087)
Observations	155	155

Standard errors in parentheses
Sample year: 1974.
Column (2) weighted by country's total imports.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

NOTE. The core "GATT Participant" countries, described in the text, are Australia, Canada, the United Kingdom, the EEC (France, Germany, Italy, Denmark, Ireland), Benelux (Belgium, Luxembourg, and the Netherlands), and Japan. Heteroskedasticity-robust standard errors of the differences in averages are reported in parentheses.

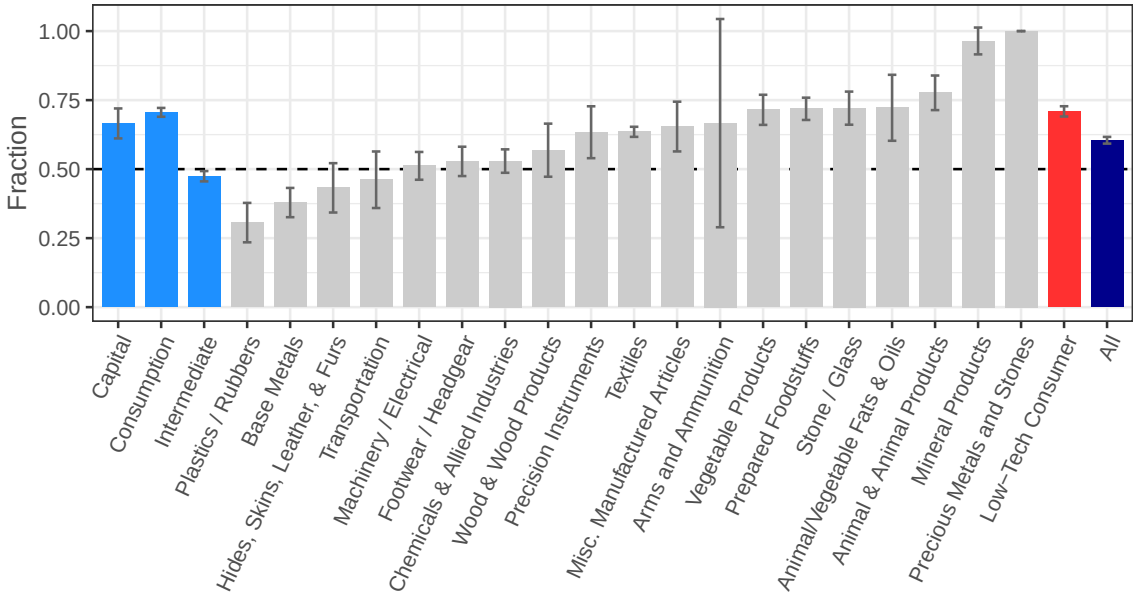
TABLE V
Income and Import Habits

	$s^i_\omega/\bar{s}$	$s^i_\omega/\bar{s}$	$s^i_\omega/\bar{s}$	$s^i_\omega/\bar{s}$
$\mathbf{1}\{p_\omega > \bar{p}_{g(\omega)}\} \times \ell_i$	-0.0345	-0.0345		
	(0.0200)	(0.0201)		
$\mathbf{1}\{p_\omega > \bar{p}_{g(\omega)}\} \times y_i$			0.192	0.192
			(0.147)	(0.148)
Observations	336501	336501	336501	336501
Good FE	No	Yes	No	Yes

NOTE. This table shows the estimates of equation (3). Standard errors are clustered at the regional (i) level. The columns with "Good FE" include good level ($g(\omega)$) fixed effects. Regional median income, y_i, is in thousands of dollars, and the low-income share, ℓ_i, is in percent.

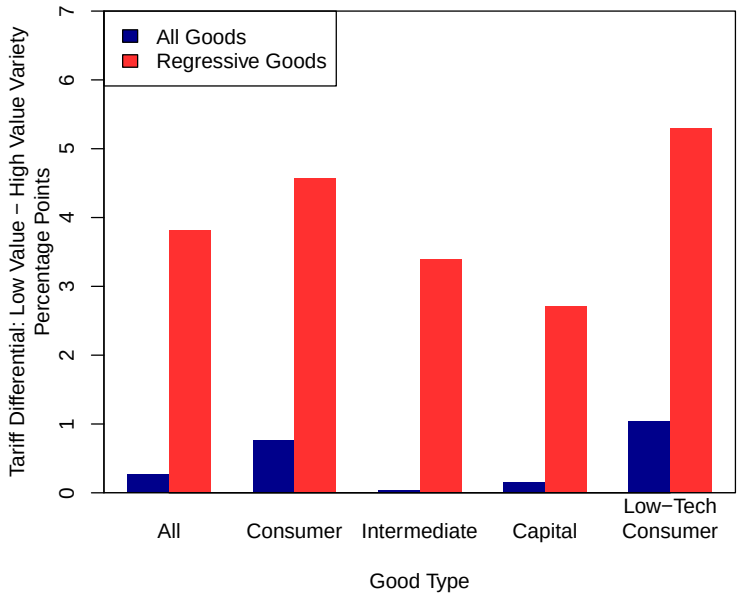
C Figures

FIGURE I
Heterogeneity and Overall Presence of the Pattern



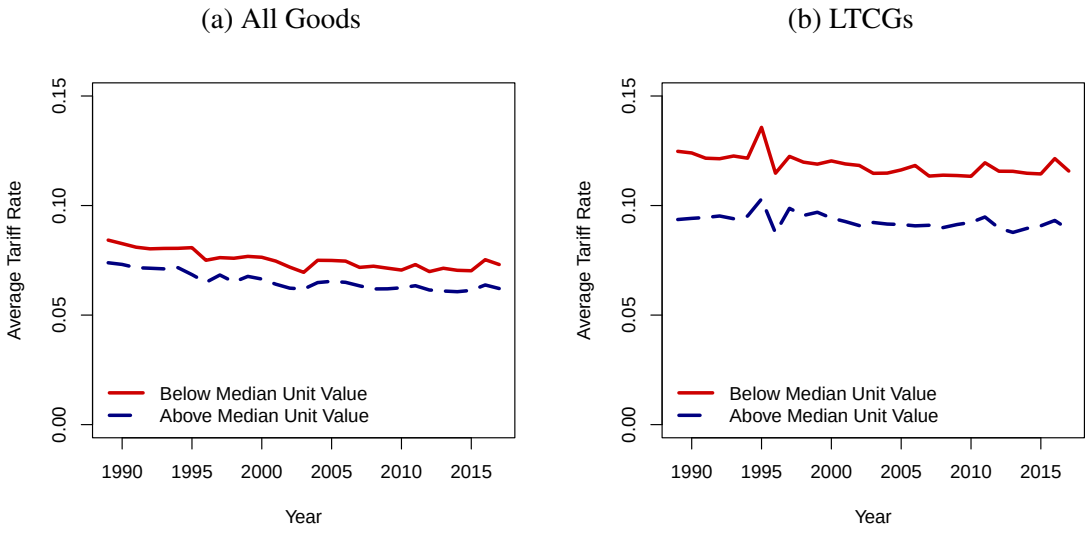
NOTE. This figure reports the share of regressive goods within each product category listed on the x-axis. Regressive goods are goods for which the average MFN *ad valorem* tariff on low-value varieties is greater than the corresponding average tariff on high-value varieties. 95% confidence intervals are shown with whiskers, computed using heteroskedasticity-robust standard errors. See Section 2.2 for a discussion of the categories and sample.

FIGURE II
Tariff Differentials between Low- and High-Value Goods



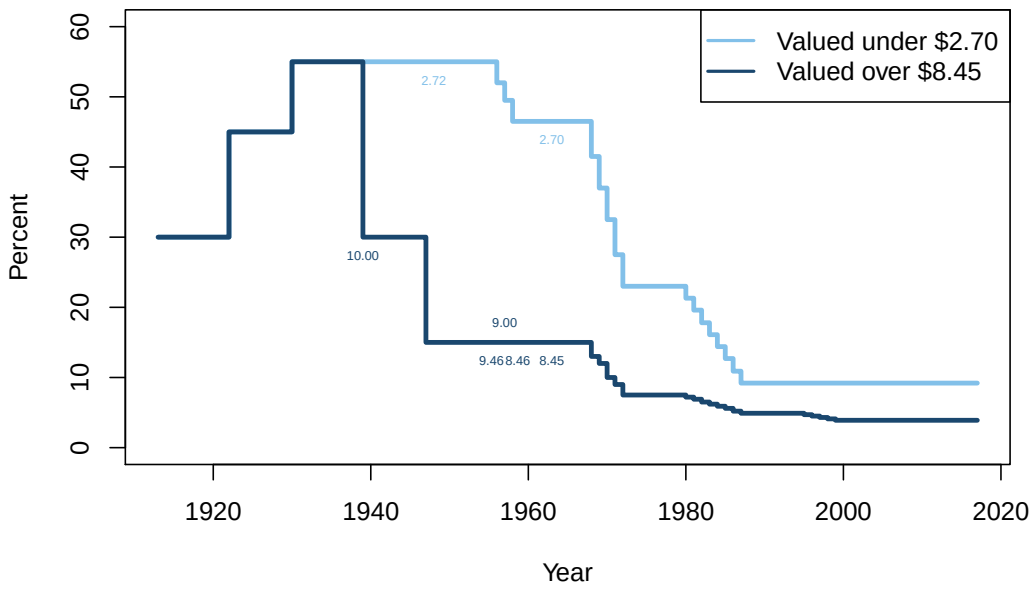
NOTE. The graph shows the average tariff differential between low- and high-value varieties among each category on the x-axis. The differential is constructed, for each good, as the difference between the average MFN *ad valorem* tariff on low-value varieties and the corresponding tariff on high-value varieties.

FIGURE III
Legislated Tariffs, 1989-2017



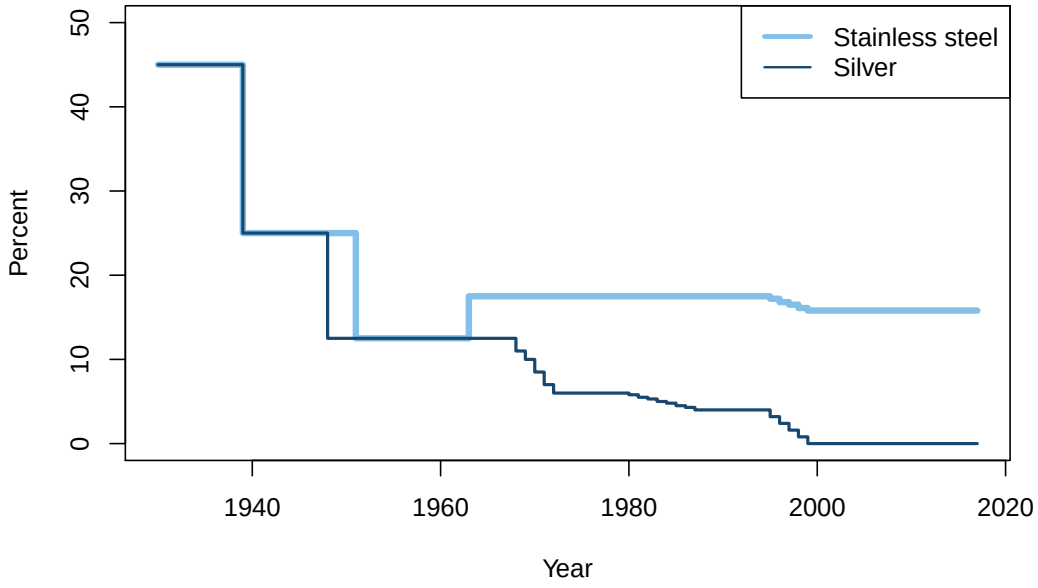
NOTE. This figure shows the (simple) average legislated tariff rate for all varieties above and below the median unit value of a good. The left panel shows this calculation for all goods/varieties in the tariff schedule, while the right panel restricts the sample to LTCGs.

FIGURE IV
History of Tariff Rates on Fishing Reels



NOTE. This figure shows the most-favored-nation tariff rate on fishing reels. Rates are from historical tariff schedules, written in the documents *U.S. Import Duties* between 1946 and 1963 (the first edition of which contains all rates since the 1930 Smoot-Hawley Act), *Tariff Schedules of the United States Annotated* between 1963 and 1989, and the HTS thereafter. Rates between 1913 and 1930 were extracted from Brossard (1930). The small numbers show instances in which the tariff-determining unit-values changed.

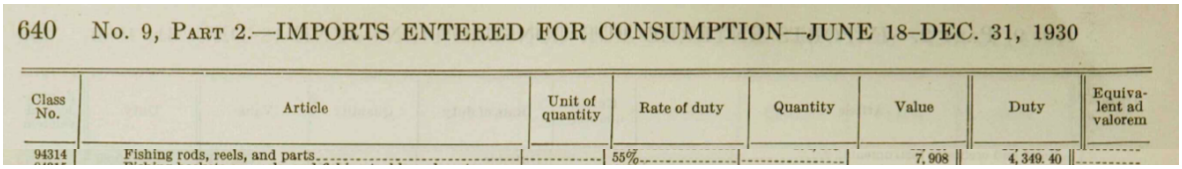
FIGURE V
History of Tariff Rates on Stainless Steel Forks



NOTE. This figure shows the most-favored-nation tariff rate on table forks with metal-plated handles. Rates are from historical tariff schedules, written in the documents *U.S. Import Duties* between 1946 and 1963 (the first edition of which contains all rates since the 1930 Smoot-Hawley Act), *Tariff Schedules of the United States Annotated* between 1963 and 1989, and the HTS thereafter.

FIGURE VI
Examples of Digitized Tariff Schedules: Fishing Reels

1930: *Foreign Commerce and Navigation of the U.S.*



640 No. 9, PART 2.—IMPORTS ENTERED FOR CONSUMPTION—JUNE 18–DEC. 31, 1930

Class No.	Article	Unit of quantity	Rate of duty	Quantity	Value	Duty	Equivalent ad valorem
94314	Fishing rods, reels, and parts		55%		7,908	4,349.40	

1950: *United States Import Duties*

UNITED STATES IMPORT DUTIES (1950)

Par. No.	Description	1930 rate	Modified rate	Reference
	Fishing reels, finished or unfinished, nspf	55% ad val.	$1.50 each, but not less than 15% nor more than 55% ad val.	TD 51602

1968: *Tariff Schedules of the U.S.*

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SCHEDULE 7. - SPECIFIED PRODUCTS; MISCELLANEOUS AND NONENUMERATED PRODUCTS 7 - 5 - A, B
Part 5. - Arms and Ammunition; Fishing Tackle; Wheel Goods; Sporting Goods, Games and Toys 730.85 - 731.60

Item	Stat. Suffix	Articles	Units of Quantity	Rates of Duty 1	Rates of Duty 2
		Fishing reels and parts thereof:			
		Reels:			
731.20	00	Valued not over $2.70 each.....	No.....	41.5% ad val.	55% ad val.
731.22	00	Valued over $2.70 but not over $8.45 each.....	No.....	$1.12 each	55% ad val.
731.24	00	Valued over $8.45 each.....	No.....	13% ad val.	55% ad val.

1980: *History of the Tariff Schedules of the U.S.*

HISTORY OF THE TARIFF SCHEDULES OF THE UNITED STATES ANNOTATED

Notes p. 6
Schedule 7
Part 5

Staged Rates

Modifications of column 1 rates of duty by Pres. Proc. 4707 (Tokyo Round), December 11, 1979, 44 F.R. 72348, as amended and Pres. Proc. 4768 (Customs Valuation Code), June 28, 1980, 45 F.R. 45135, as amended (see Preface):

TSUS item	Prior rate	Rates of duty 1/, effective with respect to articles entered, or withdrawn from warehouse, for consumption on and after --							
		January 1, 1980 except as noted	January 1, 1981	January 1, 1982	January 1, 1983	January 1, 1984	January 1, 1985	January 1, 1986	January 1, 1987
731.20	23% ad val.	21.7%	19.6%	17.8%	16.1%	14.4%	12.7%	10.9%	9.2%
731.22	62.5c each	58c each	54c each	50c each	46c each	42c each	38c each	34c each	30c each
731.24	7.5% ad val.	7.2%	6.9%	6.5%	6.2%	5.9%	5.6%	5.2%	4.9%

FIGURE VII
Tariff Rates Over Time for 15 Goods

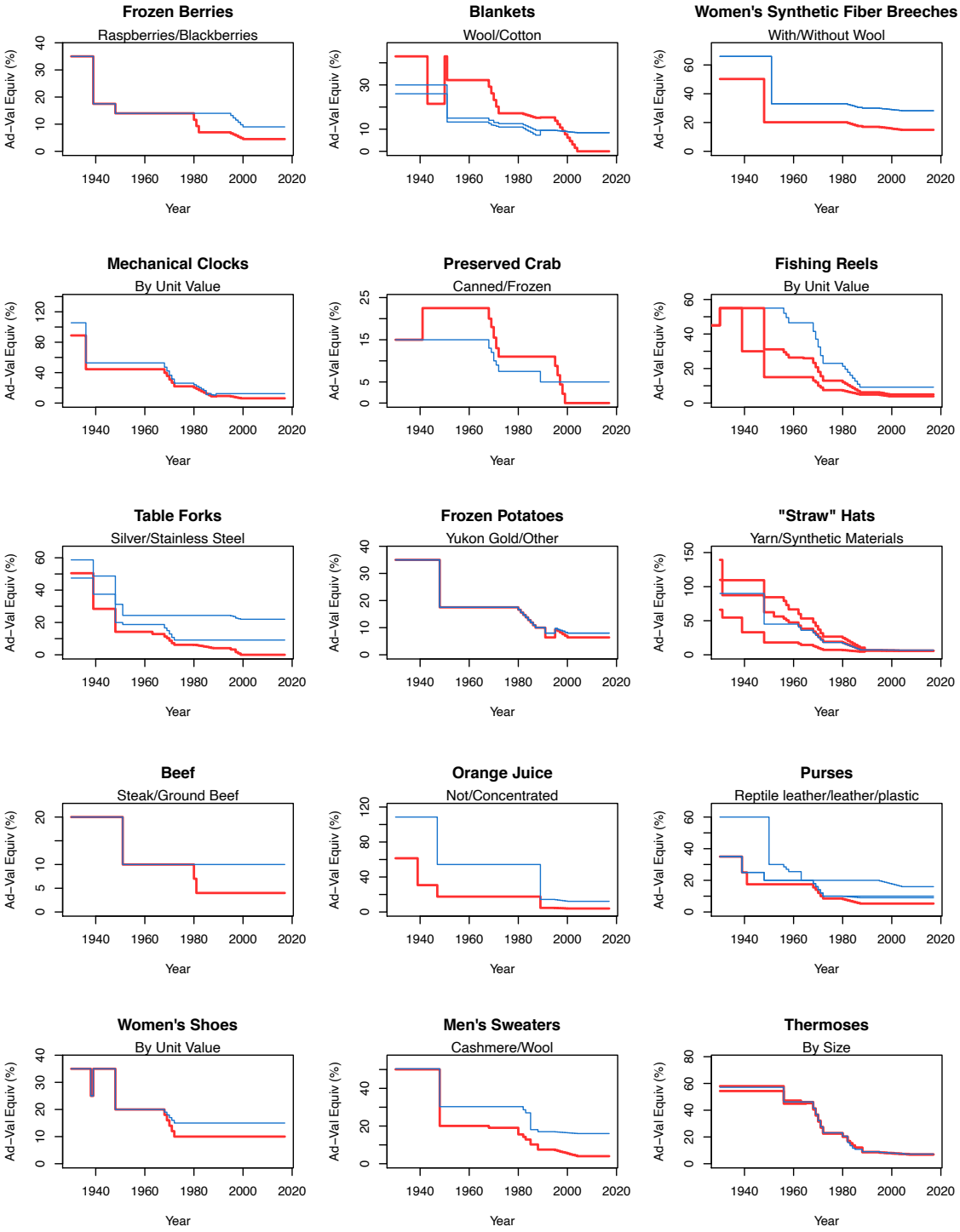


FIGURE VIII
Average AVE Tariff Relative to 1930 for 15 Goods

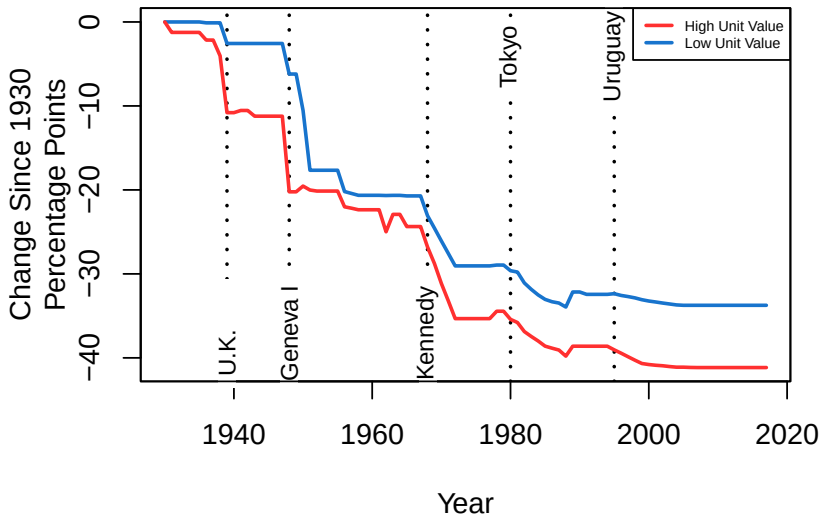


FIGURE IX
Source Countries for 15 Goods

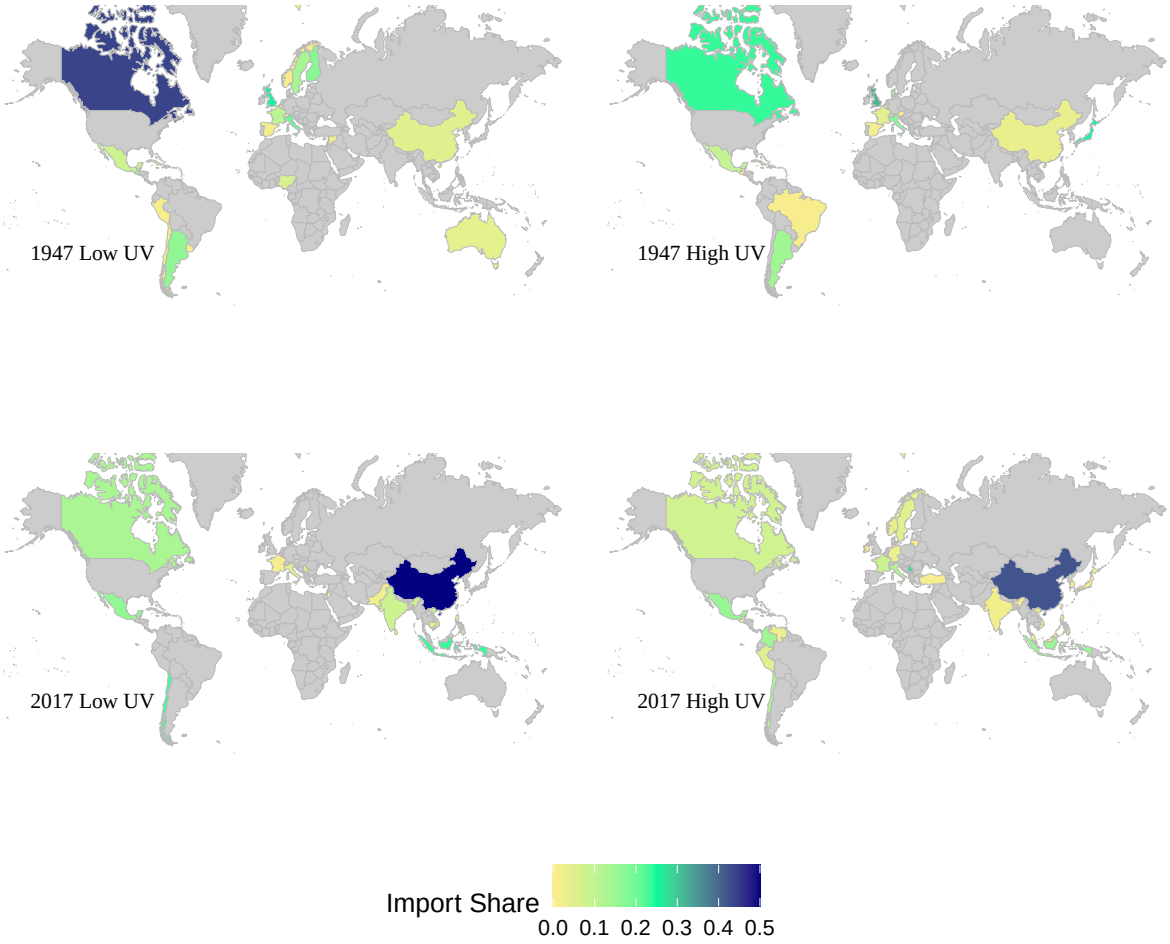
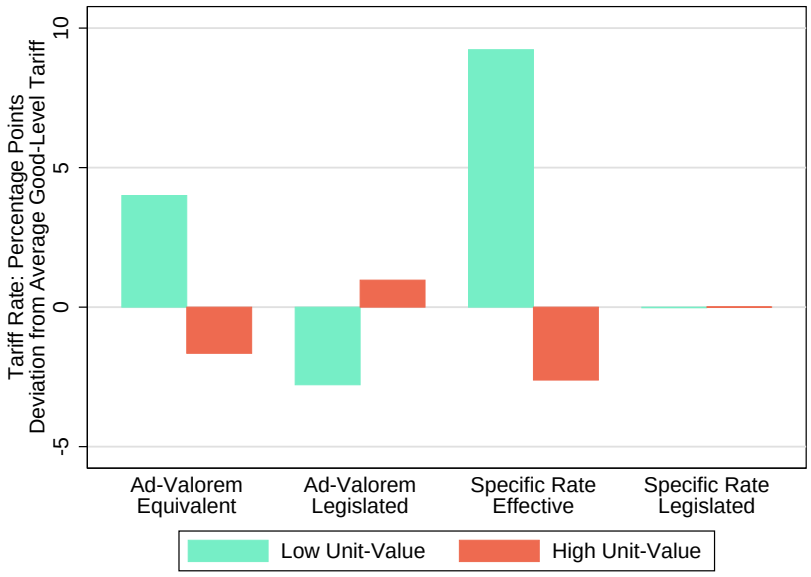


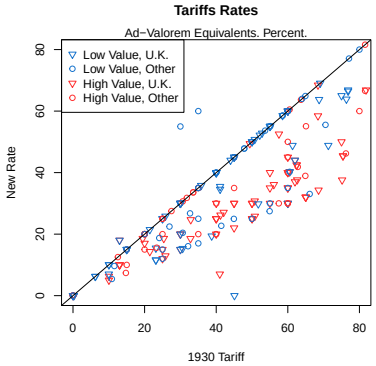
FIGURE X
Tariffs on Goods Defined by Unit Value: Smoot-Hawley Tariff



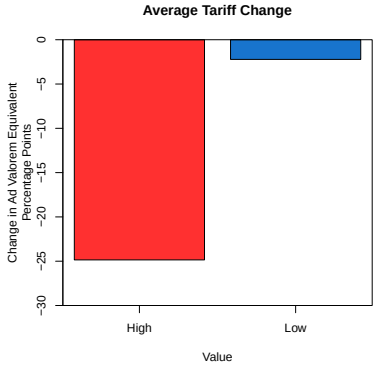
NOTE. The summary statistics here are based on the lowest- and highest-described unit-value variety within each valued good (i.e., when a good has varieties binned into more than two groups by unit value, we retain the first and last bins only). For each variety, we calculate 4 statistics: the AVE tariff (total duties/imports), the *ad valorem* legislated tariff, the "effective" specific tariff (specific tariff/unit value), and the "legislated" specific rate (specific rate/cutoff, where, for low-valued varieties, "cutoff" is the upper-bound of each variety's unit value range, and vice versa). We then take the difference between each statistic and the (trade-weighted) average value of that statistic for the corresponding good. The light (green) bars show the trade weighted averages of these difference for all low-valued varieties, and the darker (orange) bars show the averages for high-valued varieties.

FIGURE XI
Tariff Changes on Valued Goods between 1930 and 1946

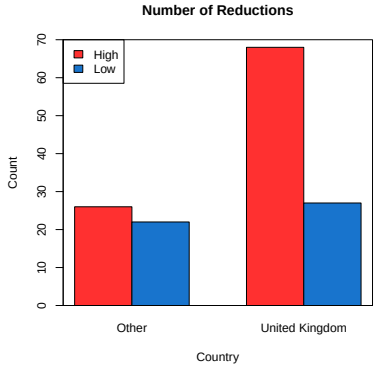
(a) 1930 vs. New Rate



(b) Average Change in Tariff Rate

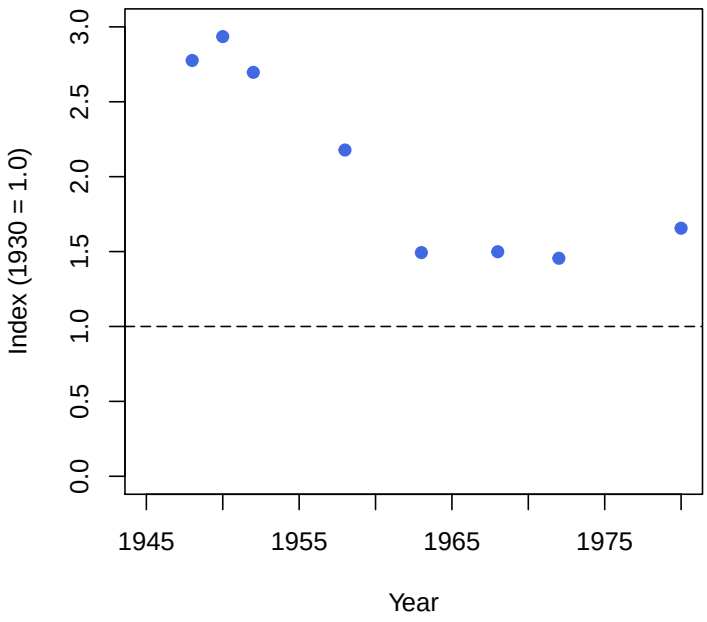


(c) Number of Reductions



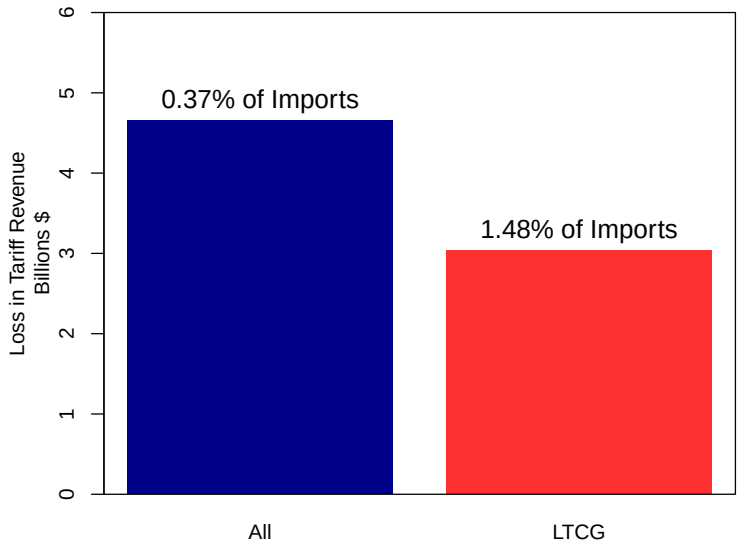
NOTE. This figure shows different representations of changes in AVE tariff rates between 1930 and 1946. The left panel shows a scatter plot of 1930 rates against new rates established after 1930. The middle panel shows the trade-weighted changes in these rates for high- and low-valued goods, and the right panel shows the number of reductions on these goods by country. As described in the text, AVEs are constructed using 1930 import values and quantities, so all changes shown only arise from changes in legislated tariffs.

FIGURE XII
Within-Good Tariff Variation Share Relative to 1930



NOTE. This figure shows the within-good share of tariff variation in each year relative to the within-good share of variation in 1930. The variance decomposition is calculated using Equation 1

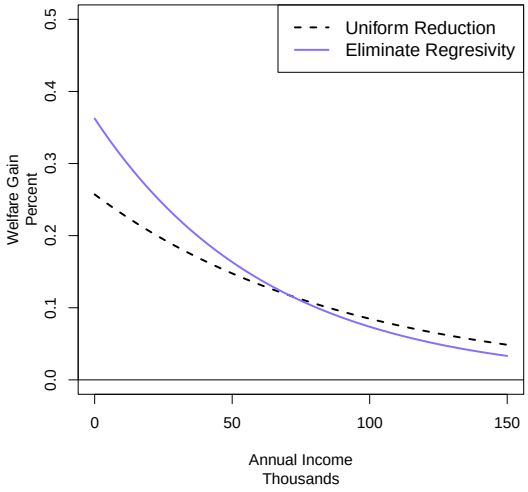
FIGURE XIII
Revenue Loss from Eliminating Regressive Pattern



NOTE. This figure shows the revenue losses in levels (bars) and relative to total imports within each category (printed numbers) under the counterfactual tariff schedules described in the text.

FIGURE XIV
Welfare Gains under Alternative Counterfactuals

(a) All Goods



(b) LTCGs

