The Price of Protection: Tariff Incidence and Import Collapse under the Infamous Smoot-Hawley Tariff *

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March 25, 2026

Abstract

Using newly digitized monthly data on the quantities and prices of imports as well as product-level data on tariff rates, we show that the Smoot-Hawley Tariff Act swiftly and dramatically reduced the quantity of affected imports. In the first year after its passage, we estimate that imports declined by as much as 8%, and on average 4%, for a one-percentage-point increase in the tariff rate, relative to imports not affected by tariffs and a trade elasticity of greater than 4. We further estimate that the incidence of the Tariff Act of 1930 was almost entirely borne by U.S. households and firms. Using an open-economy model, we attribute the high measured short-run trade elasticity to fixed exchange rate under the gold standard, which the U.S. maintained with most of its consequential trade partners in the first 15 months after enactment. Finally, we construct both partial equilibrium and general equilibrium welfare estimates of Smoot-Hawley. The former shows a deadweight loss of 0.97 % of GDP (compared to tariff revenue of 0.49% of GDP) while structural GE estimates show welfare declined by roughly 0.39% of GDP, net of tariff revenue, reflecting the high measured elasticity of substitution and low US import-GDP ratio.

JEL classification: F10,F13,F14,F63,F68

Keywords: Trade policy, pass through, Smoot-Hawley Tariff, trade elasticity, international trade, tariff incidence, welfare analysis of tariffs

*The authors thank Eliza Maxfield and Carolina Celis for excellent research assistance. We thank Alan de Bromhead, Barry Eichengreen, Juan Herreno, Douglas Irwin, Andres Rodriguez-Clare, Hiroshi Toma, and Roman D. Zarate for useful comments and suggestions. The authors may be reached at kmitchener@scu.edu and mathieupe@iadb.org.

1 Introduction

The Tariff Act of 1930 represents the largest and most comprehensive American tariff increase in the last 100 years of American trade policy. In the two years after its passage, the ad valorem equivalent tariff rate in the US increased dramatically, from 44.4% in 1930 to 59% in 1932 (Bond et al., 2013) (likely downwardly biased since this estimate ignores substitution effects), and trade volume declined by roughly 40% over this same period. The Smoot-Hawley tariff (as it is more commonly known as) raised rates on a wide range of manufacturing and agricultural imports, and greatly increased the coverage of American tariffs – with hundreds of new line items added to the tariff code. In turn, it provoked both a massive trade war (Mitchener et al., 2023) and ushered in a new era of global protectionism (Eichengreen and Irwin, 1995; Irwin, 2011, 2012).

Given Smoot-Hawley's scale and scope, this paper asks a series of straightforward questions regarding its effects. First, how did the tariff act change import prices and quantities in the short run and medium run, and is industry-level and tariff heterogeneity (ad valorem vs. specific) important in explaining the responsiveness of prices and quantities to the tariff? Second, what is the average trade elasticity derived from a large, broad-based increase in tariff rates at different time horizons, and do measured elasticities appear sensitive to monetary policy? Third, what was the estimated change in welfare due to the Smoot-Hawley tariff?

To estimate these effects and parameters, we digitized a new high-frequency data set of monthly import prices and quantities between January 1929 and June 1932. We combine these with detailed information on changes in tariffs at the product level from additional historical government documents that we also digitized. Our new data set focuses

on roughly 60% of the total value of U.S. imports in 1929 (those denoted "principal imports" by the Department of Commerce).

Our data and setting have several appealing features. First, as noted above, the 1930 Tariff Act affected a wide range of imports. Although the tariff started as a 1928 Presidential campaign promise aimed at addressing the ongoing struggles of farmers in the 1920s, it quickly spiraled into a much more comprehensive rewrite of the U.S. tariff code that also resulted in significant changes to manufacturing tariffs. After a considerable and protracted negotiation in the House and Senate, the tariffs appearing in the final version of the bill affected many products and sectors, and thus impacted a large number of trade partners' chief exports (Mitchener et al., 2023). The broad-based changes in tariffs enacted in June 1930 allow us to examine an infamous example of a large economy considerably ratcheting up its tariffs. Second, because the U.S. and nearly all of its trade partners were on the gold standard when Smoot-Hawley was passed, we are able to isolate the effects of the tariff on prices and quantities free of exchange-rate effects for more than a year. Third, prior to the proposed recent changes in the U.S. tariff code, the Tariff Act of 1930 represents the last 20th century example of American trade policy where tariffs were radically increased. After World War II, the U.S. actively engaged in both multilateral (through GATT and WTO) and regional tariff agreements that lowered tariffs. Subsequent tariff hikes were usually limited to just a few products and were often temporary in nature. Fourth, although the U.S. economy may be experiencing a similar large shift in tariff policy in 2025, as of writing, this most recent episode's effects are not fully observable since the tariff code continues to be revised due to fluid governmental policies and legal rulings. Our episode thus provides a historical complement to studies examining the effects of the much more limited tariff increases during the first Trump administration as well

as the ones currently being enacted during his second term as president. Additionally, given the nature of our episode, we provide estimates of a change in tariffs that has a clear starting date and remained invariant at least up to June 1934, when the Reciprocal Trade Agreements Act (RTAA) was enacted.

Our study begins by documenting the effects of tariffs on prices at the market of origin. This exercise allows us to estimate whether the increase in tariffs was absorbed, in whole or in part, by the foreign producer. We build a database consisting of 73 import categories accounting for 60% of total U.S. imports (by value) that can be matched to monthly, free-on-board (FOB) import prices between January 1929 and June 1932. We construct panel data that contains goods with and without tariffs as well as products that saw their tariff rates increase in 1930 and those that did not. An advantage of our dataset is that includes pre-tariff import prices that are averages of wholesale prices of imports observed at the exporter's port. For estimation purposes, these import prices are superior to unit values (i.e., the implied price of imports, which are computed by dividing the total value of an import by the total quantity imported). Using unit values for inference can be problematic because some characteristics might not be homogeneous within a given import category. For example, any changes in the composition of imports, by characteristic, volume or quality, within an import category, could affect their measurement and hence inference.

The heterogeneity in products affected by 1930 changes in the U.S. tariff code allows us to construct treatment (products experiencing positive increases in tariff rates in 1930, including the intensity of the change) and control (those that did not) groups to estimate the cross-sectional effects of tariff changes, exploiting product and time variation. Using panel event-study models with time and product fixed effects, we find large and significant reductions in the quantities imported as well as their values for treated imports and

relative to imports that did not experience positive increases in tariffs in 1930. The average measured effects of the tariffs reduced quantities and values of treated imports by roughly 5% three months after the implementation of the tariff and of almost 8% a year after their imposition. The reductions in quantities and values due to tariffs are even larger in magnitude when we include sector-time fixed effects, consistent with larger tariff-induced substitution within sectors. We find no evidence of pre-trends or anticipation effects when examining the treatment and control groups and IV estimates show similar estimated average effects on prices and quantities. Across different specifications, we find an average trade elasticity within the first year after the enactment of Smoot-Hawley of between 4.43 and 5.25 – a quantitative finding we explore in more detail. [1]

Using a similar specification, we next consider tariff incidence, and find little evidence that foreign producers lowered their product prices in response to the 1930 tariff. This result implies that American wholesalers or consumers absorbed any changes in product prices arising from the Smoot-Hawley tariff. In 1930, we find no significant differences in prices between products that saw their tariffs rise and those that did not, implying no significant price anticipation and similar trends across the two groups. After implementation, we find some evidence of absorption by foreign producers in the first trimester. The estimates show a negative and statistically significant coefficient on the interaction between post and treatment of roughly 0.75, suggesting that foreign producers absorbed

[1] The trade elasticity, depending on the model, is typically interpreted as one minus the elasticity of substitution between varieties produced in different locations. For the Smoot-Hawley tariff, variation in tariff rates occurs at the product level rather than by exporter location. In our setting, we measure the elasticity of substitution between different products, comparing treated products to untreated ones. By including sector fixed effects, we compare products that are more similar; however, we cannot compare the exact same product across destinations. In models with nested CES preferences, where substitution across varieties within a product is higher than substitution across broader product categories, our estimates should therefore be interpreted as a lower bound in absolute value for the elasticity of substitution across varieties of the same product.

75% of the change in tariffs. However, event-study plots using monthly data reveal this result to be temporal, lasting only a couple of months. Thereafter, the coefficient displays values that are largely indistinguishable from zero for the remainder of the sample period. Event studies reveal no evidence of systematic price absorption by foreign producers in 1930, 1931, or 1932, and diff-in-diff regression estimates show an average effect on prices that is not statistically different from zero for the treated sample once Smoot-Hawley was enacted.

Our data allow us to generate import trade elasticities at different time horizons using product-level data (Boehm et al., 2023). We therefore present a new set of tariff-based trade elasticities based on the most comprehensive change to the US tariff code in the last century. Our estimates are also free from changes in monetary policy since the US and almost all of its trade partners remained on the gold standard until September 1931 (when Great Britain devalued), allowing us to isolate the responsiveness of quantities to trade policy rather than trade and monetary policy in the short-run (Auclert et al., 2025; Monacelli, 2025).

Empirically, we find a large and rapid effect of tariffs on quantities imported. In absolute value, our short-run trade elasticity is considerably larger than recent research by Boehm et al. (2023), which uses cross-country data on tariff changes and finds tariff-based trade elasticities of less than 2 in the year following the rate change in tariffs. Using a simple, New Keynesian model, we show that exchange-rate movements driven by changes in monetary policy can partially offset the effects of tariffs in the short run, explaining the lower measured reduced-form trade elasticities found in other empirical settings. In the short run, changes in the exchange rate can affect the prices faced by importers and exporters, reducing the effect of tariffs on quantities in transition. Similar to Boehm et al.

(2023), our model indicates that the effect of tariffs on quantities imported depends on the direct effect of the tariff on quantities (the elasticity of substitutions between varieties imports) as well as on the indirect effect that tariffs produce on supplier decisions due to changes in prices. This indirect effect, in turn, depends on the effect of tariffs on prices of production and the effect of tariffs on the exchange rate. However, given that the U.S. was on the gold standard and had a fixed exchange rate during our sample period, exchange-rate movements are muted. Moreover, our empirical estimates show that foreign exporters did not respond to Smoot-Hawley by lowering their prices. Combining these two factors implies that our estimates of changes in quantities due to the 1930 tariff will measure the elasticity of substitution between varieties.

Using the model, we can also see why the measured trade elasticity can be smaller in the short run. If market conditions change producer prices, or monetary policy reacts to tariffs, for example depreciating the local currency, the measured effect on quantities can be lower in the short run, even with a relatively large elasticity of substitution between varieties. Our results highlight the importance of considering the monetary policy reaction when interpreting the effect of tariffs on the quantity imported, which is also key to understand the aggregate implications of tariffs (Auclert et al., 2025; Monacelli, 2025).

With these estimates in hand, namely, the trade elasticity and expenditure shares, we then evaluate the welfare implications of tariffs. Using a partial equilibrium analysis as in Amiti et al. (2019), we find that the tariffs we estimate imply a deadweight loss of roughly 0.97% of GDP, given imports were a relatively small fraction of U.S. GDP, and a welfare loss of 0.48%, given the relatively high tariff revenue (0.49% of GDP in 1931). In comparison, Amiti et al. (2019) find an annual estimated deadweight loss of roughly 0.09% of GDP per year for the much narrower set of tariffs imposed by the US in 2018. Using

the general equilibrium approach of Costinot and Rodríguez-Clare (2014), we estimate a welfare decline of about 0.39% of GDP. For comparison, Fajgelbaum et al. (2020) build a general equilibrium model and estimate the annual deadweight loss from the limited 2018 tariffs as 0.04% of US GDP. Our relatively modest estimate for Smoot-Hawley is explained by the high share of domestic expenditure (over 95%) and the large estimated trade elasticity. Irwin (2011) and Crucini and Kahn (2007), among others, find relatively modest effects of the Smoot-Hawley Tariff on GDP, mainly due to the low share of imports relative to GDP. Our analysis complements their findings by focusing on welfare implications as we explicitly measure the elasticity of substitution for the goods exposed to tariffs at the time. Our estimate, in addition to the effect attributable to import's low share of US GDP highlighted in earlier studies, reduces the potential welfare effects, even with large changes in tariff rates brought about by the Tariff Act of 1930.

Literature Review. Our study contributes to the literature in several ways. First, we respond to the recent call for more empirical studies on trade policy (Goldberg and Pavcnik, 2016), and focus on the most infamous case of American trade policy from the 20th century. The recent return of protectionism in the United States has also prompted new research interested in quantifying the effects of trade policy. Our paper is most closely related to those examining pass-through and tariff incidence in the context of the 2018-19 and 2025 tariff episodes Amiti et al., 2019; Gopinath and Neiman, 2025; Cavallo et al., 2025; Fajgelbaum et al., 2020; Flaaen et al., 2020; Cavallo et al., 2021. As in many of these studies, we find nearly complete pass-through on prices to the domestic economy as well as significant effects on the quantity of imports targeted by new tariffs. (For example, using a similar event-study design Fajgelbaum et al. (2020) find tariff-targeted products in 2018-19 fell by roughly 2.5%; in our setting, the quantity of imports fell by roughly 8% in

the year following implementation). One advantage of our data is that we are able to obtain import prices measured at the market of origin instead of unit values (i.e., prices that are inferred by dividing the value of a traded articles by their quantities), and that can be affected by measurement bias (including quality changes and within-category heterogeneity) as well as simultaneity bias (Fontagne et al., 2022; Feenstra and Romalis, 2014). Import prices collected at the market of origin (exporter to the U.S.) thus allow for cleaner measurement of pass-through to American households and producers. We then obtain changes in tariffs before and after Smoot-Hawley as well as the quantities and values for each specific import to estimate the effects of tariff changes on prices and quantities for the same group of products.

Like recent changes in commercial policy, our study focuses on tariff incidence for a large economy. The 2018-19 trade policy change, however, differs from the Tariff Act of 1930 in that the new tariffs disproportionately targeted Chinese imports (via Section 301) and otherwise affected a more limited range of imports (e.g., metals, solar panels, washing machines through Sections 201 and 232).[2] The 2025 Trump administration tariffs potentially represent a more apt comparison to Smoot-Hawley in terms of their scale and scope, especially if one considers the April "Liberation Day" tariffs, which included a 10% minimum tariff on all trade partners and additional "reciprocal tariffs" that varied by country. However, an important difference is that the rate increases in 1930 were almost entirely assessed at the product level, so many goods that the US did not produce, both inputs of production or consumption goods (such as bananas), were not affected by the Tariff Act of 1930, which explains our relatively large trade elasticity and the small, measured welfare effects of Smoot-Hawley (Arkolakis et al., 2012). Today, rates have yet

[2]It also featured some non-tariff arrangements, such as purchase agreements of agricultural goods.

to settle at their new levels due to the Trump administration's intended response to the 2026 Supreme Court ruling against the legality of many of the early 2025 tariffs, continued bilateral trade negotiations between the US and its trade partners, and the suggestion by the administration that additional product-level tariffs (beyond those already implemented) may be imposed. Since the final rates are not yet known, it is therefore difficult to estimate parameters necessary for evaluating the effects of the 2025-6 tariffs.

Researchers have also noted that estimating the effects of policy-based tariff hikes for the recent period is particularly challenging because of shipment lags, subsequent exemptions at the product and company level (e.g., microchips), USMCA inclusion, evasion and uneven enforcement (Gopinath and Neiman, 2025). Our study thus provides an empirical setting that is complete and comprehensive. We have a full and known set of rate changes applying to a large change in US tariff policy that remained invariant for four years, allowing us to measure the tariff's effects on prices and quantities in the short run and medium run. Moreover, we have a setting where we can explicitly control for the effects of exchange rates on trade prices and quantities, given the U.S. remained on gold until April 5, 1933. Also, important trade partners of the US, such as Great Britain, Canada, and Japan only went off gold beginning in September 1931, 15 months after the implementation of Smoot-Hawley. Finally, in comparison to episodes such as 2018-19 which are also "complete," in the sense that we can now fully observe short-run and medium-run effects, our setting provides evidence on a more comprehensive overhaul of the tariff system.

Our research also relates to interest in empirically estimating the macroeconomic effects of tariffs (Känzig and den Besten, 2025; Barnichon and Singh, 2025) and specifically estimating trade elasticities using trade policy, a key parameter of interest in international trade (See Anderson and van Wincoop (2004) and Head and Mayer (2014) for re-

views). Using aggregate import data, Irwin (1998b) quantifies the effects of of the Smoot-Hawley tariff on imports and finds modest effects. We complement those findings by using product-level data on tariffs and imports to measure trade elasticities. We find complete pass-through and large effects of the Smoot-Hawley Tariff on the quantities of affected imports. This last result implies a high trade elasticity and considerable domestic substitution between goods affected and not affected by the new tariffs.

Recent examples use cross-country changes in tariffs, Boehm et al. (2023), derive a policy-based estimate using changes in most-favored-nation status. They find relatively small trade elasticities in the short run in comparison to longer-run estimates. Teti (2024) revisit the measurement of the tariff rates used in Boehm et al. (2023), finding significant issues in terms of measurement. Our empirical approach for estimating trade elasticities differs in that we use a single, large, within-country tariff shock that is characterized by a large number of changes across many product groups. We exploit this product-level variation in tariff rates and monthly data to trace out the evolution of elasticities over the short run and medium run. Furthermore, since the rate changes arising from the Tariff Act of 1930 were almost exclusively assessed at the product level, they were homogeneous across most destinations. Moreover, unlike other data sets, they remained in place for several years after implementation. In summary, these characteristics of our data allow us to compute short-run and medium-run elasticities and avoid measurement issues described in Teti (2024). Our estimates show large trade elasticities, even in the short run. Our research thus complements existing studies focusing on post-World War II trade policy changes by producing a set of product-group estimates as well as an average trade elasticity estimate over various horizons for the 1930s.

Finally, our research contributes to a recent stream of papers evaluating the effects of

trade policy in interwar period using modern empirical methods and disaggregated or large data sets (Jacks et al., 2008; Bond et al., 2013; Jacks et al., 2020; Vellore et al., 2024; Mitchener et al., 2023; Chakarbarty et al., 2025; Greenland and Lopreseti, 2022). The Tariff Act of 1930 has received considerable attention from economic historians (Irwin, 1998a, 2012, 1998b, 2011; Crucini, 1996; Crucini and Kahn, 2007). Irwin (2010), using sector level data, estimates deadweight loss (DWL) from the existence of US tariffs between 1859 to 1961. Our DWL estimates are slightly larger than Irwin's for the relevant period of overlap, the early 1930s, mainly due to our larger estimated elasticity of substitution. Crucini (1994) was one of the first articles to make use of micro level data on Smoot-Hawley tariff rates. Our paper builds on the methodology of his research and more recent scholarship Bond et al. (2013); Greenland and Lopreseti (2022); Chakarbarty et al. (2025) that exploits the cross-sectional variation in tariff rate changes in 1930 by also drawing on new high-frequency quantity and price data on imports from the period around the tariff act. Our high-frequency panel data allow us to apply modern micro empirical methods to analyze outcomes that vary both across industries and over time. Our study thus not only throws new light on this important historical episode by providing quantitative estimates of the tariff's effects on quantities and prices, but also provides novel estimates of key trade parameters whose values have often been assumed in the existing literature on the interwar period. For example, in generating gravity-based estimates for trade costs for the interwar period, Jacks et al. (2011) have to assume a value of -8 for the elasticity of substitution based on their reading of estimates from other time periods. Exploiting the cross-sectional variation in rate changes and monthly data, we improve upon this by providing period-specific or interwar estimates of the conceptually-related, but broader concept of a trade elasticity, and that complement another recent interwar estimate based on British

trade data De Bromhead et al. (2019). Moreover, existing research on Smoot-Hawley often assumes a value for pass through or estimates it using simple cross-sectional regressions so the tariff's macroeconomic impact can be evaluated (Bond et al., 2013). Our data and event-study analysis allow us to generate monthly estimates of the effects of Smoot-Hawley on import prices while controlling for potential confounders, such as differences in the types of tariffs across imports (specific vs. ad valorem) and differences in import substitution across sectors of the US economy.

The rest of the paper is organized as follows. Section 2 describes the historical context and the data we use. Section 3 presents our empirical strategy and estimates the effects of Smoot-Hawley on quantities, values, and prices. Section 4 discusses the implications of our findings for in terms of the welfare, and Section 5 concludes.

2 Data and Historical Setting

2.1 The Tariff Act of 1930

The origins of the Tariff Act of 1930 date back at least to campaign-trail promises made by Republican presidential candidate Herbert Hoover to Midwestern farmers – an important constituency. In spite of the Emergency Tariff Act of 1921 and the Fordney-McCumber Tariff of 1922, agricultural farm prices were falling relative to non-agricultural goods throughout the decade (Eichengreen, 1989). In addition, farmers were saddled with debt and foreclosures from wartime expansion of cultivable land that was no longer paying off due to the return of European producers after the end of World War I. Two months before Hoover's inauguration in March 1929, the Republican-controlled House Ways and Means Committee began meeting on the issue of American tariffs with the hope of acting on the newly-elected President's tariff agenda.

However, as drafts of the proposed legislation passed between the the House and Senate over the subsequent year and a half, it was clear legislators had moved beyond the "limited tariff" Hoover had called for in his inaugural address to a much more comprehensive tariff, one that would that would not only seek relief for agricultural, but one that would also significantly alter manufacturing tariffs. The classic analysis of pork barrel politics (Schattschneider, 1935) describes how the proposed legislation's reach broadened considerably through a process "reciprocal noninterference," where no one import-competing group benefited more than any other, but a broad coalition of import-competing sectors benefited sufficiently so as to support its passage. Subsequent research argues that vote-trading and log rolling in the Senate also played a pivotal role in widening the coverage of the tariff (Irwin and Kroszner, 1996). The final version, sponsored by Senator Reed Smoot (UT) and Representative Willis Hawley (OR) was signed into law on June 17, 1930.

Around the time of the implementation of the Tariff Act of 1930, imports were small relative to US GDP. Table 1 shows that in 1929 imports accounted for 4.2% of GDP. After the stock market crash of October 1929, GDP and imports both collapsed quickly: by 1931, nominal GDP was 26% lower than in 1929 and the value of imports was 51% lower. Both prices and quantities declined during this period, which helps explain the fall in both nominal GDP and the value of imports. Irwin (2011) argues that between 30-40% of the decline in imports can be attributed directly to Smoot-Hawley, due to the increases in duties, or indirectly, since deflation increased the average tariff paid on goods subject to specific tariffs. As a result of this decline, imports as a share of GDP fell from 4.2% of GDP in 1929 to 2.7% in 1931. Tariff revenue declined from 0.56% of GDP to 0.48%, despite the rising average tariff rates.

The American tariff code was already large and complex before Smoot-Hawley tar-

Table 1: Imports and GDP between 1929 and 1931

Year	1929	1930	1931
GDP (USD, billions)	103.6	91.2	76.5
Imports (USD, billions)	4.34	3.11	2.09
Tariff Revenue (USD, billions)	0.58	0.462	0.37
Imports over GDP	4.19%	3.41%	2.73%
Tariff Revenue over GDP	0.564%	0.506%	0.485%

Notes: GDP, imports, and tariffs revenues are in nominal USD. GDP is from the U.S. Bureau of Economic Analysis. Imports and tariff revenue are from the the U.S. Department of Commerce, *Foreign Commerce and Navigation Acts of the United States* (1929, 1930, 1931) DoC (1930).

iffs was enacted. There were around 4,500 categories of goods. Among them, almost half were subject to ad valorem tariffs, around one fourth to specific tariffs, and nearly 10 percent to compound tariffs (a combination of both a specific and ad valorem tariff).[3] The remaining categories corresponded to goods with no tariffs. After Smoot-Hawley, the number of categories increased by around 10%, to roughly 5,000. The composition of categories remained relatively constant, with a slight decrease in exempt categories and categories with specific tariffs, and an increase in categories with ad valorem tariffs and compound tariffs. By far, the group with the largest number of tariff categories was "cotton manufactures," with roughly 1,000 tariff lines, many of which varied by numerical thresholds that captured specific product characteristics. Certain groups of metals, metal manufactures and industrial chemicals also had a large number of tariff categories.

Ideally, one could use product-level tariff data to construct a weighted average rate tariff rate, pre and post any change in a country's tariff code. However, comparing changes in tariff rates over time on an article-by-article basis is quite challenging since new sub-

[3]This breakdown accounts for the number of products (i.e., at the level of the tariff line) and is not weighted by the quantity imported. Irwin (1998a) reports that 65% of dutiable imports had specific or compound tariffs in 1925 weighted by value of imports.

categories of tariffs can be created when the tariff code changes. Nevertheless, we can still exploit disaggregated data to gain a more accurate assessment of how the Smoot-Hawley tariff altered the average tariff rate on dutiable goods. To do so, we construct average tariff rates based on the 88 sub-categories of imports. These 88 categories encompass all U.S. imports at the time of enactment and are published in the 1930 edition of U.S. Department of Commerce, *Foreign Commerce and Navigation of the United States*. They roughly correspond to trade at the 2-digit-level using today's Harmonized System Codes. Specifically, we calculate the total amount paid in tariffs divided by the imports subjects to a rate, the ad valorem equivalent rate, for each of the 88 categories before and after the enactment of Smoot-Hawley. We then take the average of these 88 rates. Using this methodology, the ad valorem equivalent rate was around 44.5% before enactment of the Tariff Act of 1930. After that tariff came into effect, the ad valorem equivalent rate increased to 50.4%. This change in the tariff rate considers only articles that were dutiable, but many imported articles entered duty free. If we consider the large fraction of goods that entered the US duty free, the average rate across all 88 categories increased from 15.9% to 17.5%. Of course, that average rate also includes substitution between categories, reducing the total revenue collected and hence the implied tariff rate using an ad valorem equivalent. In order to have a sense of how much substitution matters, we estimate the ad valorem equivalent rate for each of the 88 categories. Using this approach, the average rate increased from 12.1% (weighted by total imports in the first half of 1930) to 18.1%, six months after the enactment of the Tariff Act of 1930.

These average calculations, at the 2-digit level, mask variation in rate changes across product categories. Some categories had rates as high as 85%. Others, such as non-manufactured silk or petroleum, had no tariffs before or after June 1930. In general, goods

that were harder to produce in the United States, such as bananas and turmeric, or important intermediate inputs, such as copper or iron ore, were not affected by the new tariff schedule: Smoot-Hawley did not change their rates. In contrast, goods that the United States produced more intensively had higher tariffs and larger tariff increases. For example, goods such as rice or wool clothing already had high rates before June 1930, but were also subjected to large rate increases under Smoot-Hawley. These rate changes reflect Congressional negotiation over the scope of Tariff Act, as discussed earlier. From a measurement perspective, the political economy of these rate changes implies that many highly tariffed goods likely had near substitutes, which could have implications for how much of the incidence is borne by foreign suppliers, a point we return to later.

2.2 Data

We now describe the construction of a micro-level panel dataset, which we will use in our empirical analysis. To understand the effects of the Smoot-Hawley tariff on quantities and prices of imports, we digitized several different U.S. government publications. For import prices at the product level, we digitized the U.S. Department of Commerce's *Monthly Summary of Foreign Commerce* (BFDC, 1932). Through June 1932, this publication included a table entitled, "Monthly Average Prices of Principal Articles Exported and Imported," which displays many of the most important U.S. tradables by value added. Table A.2 in Appendix A shows that the products specified as "principal imports" by the US government represented 60% of the total value imported in the US by the first half of 1930, just prior to the enactment of Smoot-Hawley. The table's note further specifies that import prices are "based on wholesale price of articles in the markets of the countries from which imported for unit of quantity stated." These reported prices are thus the price of the import to the U.S. recorded in the country of origin (or exporting country)

and represent wholesale prices received at the port before any U.S. tariffs are applied. Throughout our discussion, we refer to these as "import prices."

As noted, the data on import prices shown for principal imports is a subset of all imports, consisting of 82 products such as "beef and veal, fresh," "spun silk," and "unrefined copper." In some months and for some goods, there are no import prices listed in the table perhaps because there were no imports in that month, or there was a publication timing issue or some other issue that was not reported in the publication. For some of these cases, we were able to find the missing price from the publication in the same month, but one year later, which also reported prices for the month of interest. All import prices are quoted in US dollars.[4] We drop any product that still had missing values since these can affect the interpretation of the results in difference-in-differences estimates, our main estimation strategy utilized in the empirical section.[5] Using this source for price data (an alternative is discussed below), we obtain a consistent set of 73 products with a full series of monthly prices beginning in January 1929 and continuing through June 1932, the last month the "principal import and export" data appears in the publication. [6] Appendix Table A.1 shows that the 73 products included in our sample span all the 1-digit classification codes or groups that the U.S. Commerce Department utilized for imports in the late 1920s and early 1930s.

We then obtained the tariffs that applied to each of the 73 products (if any) before and after Smoot-Hawley was enacted using *Foreign Commerce and Navigation of the United*

[4]Most US trade partners were on the gold standard up through August 1931, so exchange rate changes likely played a very small role in explaining changes in those prices given rates were pegged and stable.

[5]In most cases, goods with missing prices also have missing quantities. In one case (Coal: Bituminous), there is only one missing price, for July 1931, but no missing quantity for that month, and that good had price and quantity data for the rest of the period. So, we impute the price of that good for July 1931 by averaging the prices for June and August (i.e., 0.5*(4.68+4.58)).

[6]The publication changes format thereafter and reports less information.

States (DoC, 1930). (The Tariff Act of 1930 are the only tariff changes that occurred during our sample period.) Following other scholars (Bond et al., 2013), we use Table 9 from this government publication for the line-item tariff rates.[7] The table provides the complete list of items imported into the U.S., specifically each article's name, a five-digit classification number, the unit of the quantity imported, the rate of the tariff if applicable (ad-valorem, specific, or both), the quantity imported, the value imported, the total amount paid in tariffs, and the equivalent ad valorem tariff in the case of products with specific tariffs or a combination of an ad valorem and specific tariff.[8] Generally, these figures are reported annually. However, given the large changes in the tariff code that took place midway through 1930, the 1930 publication conveniently reports two tables of interest: one covering data on imports from January 1930 to June 17th 1930 (before the implementation of Smoot-Hawley) and one from June 18th 1930 to December 1930 (after enactment and implementation). The *Monthly Summary of Foreign Commerce* presents monthly data on quantity and values imported for the same goods.

Using this table, we obtain the an ad valorem rate or an ad valorem equivalent rate for each article imported. Many of the articles for which we have monthly import prices correspond directly to the tariff line level or the 5-digit classification number provided in Table 9.[9] In some instances, there were multiple sub-products listed with differing tariff rates; in these cases, we aggregate up to the next nearest classification. Appendix Tables

[7]The full title of Table 9 is "Imported Merchandise Entered for Consumption, Including Entries for Consumption and Withdrawals from Warehouse for Consumption, With Rates and Amounts of Duty Collected."

[8]For a given article, the ad valorem equivalent shown in the table is calculated as total tariff revenue divided by total value.

[9]The Tariff Act of 1930 conveniently began to list products using this 5-digit classification number and classified the existing (pre-1930) products and tariffs similarly in its 1930 volume. Our sample period significantly predates the introduction of harmonized tariff schedules, but most of our categories would be roughly equivalent to 3-4 digit level of classification under the modern, harmonized system.

A.3 and A.4 show the exact correspondence between the two sources that we used both for 1930 H1 and 1930 H2. We validate this correspondence in Appendix C. With this information, we build a monthly series of quantity, values, and prices at the border for 73 products between January 1929 to June 1932.

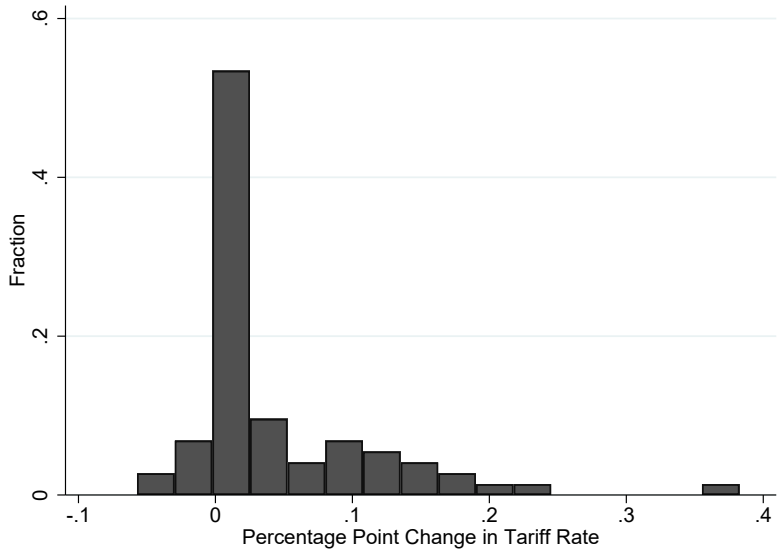
53% of the articles in our sample of principal imports had tariffs prior to the Tariff Act of 1930. For our sample of principal imports, ad-valorem equivalent rates from January 1st to June 17th, 1930 ranged from of 0.8% for wheat to a 125% in the case of tobacco leaves. After the enactment of the Smoot-Hawley tariff, 58.9% of articles in our sample had tariffs. On average, comparing duties in the first and second half of 1930 (January 1st to June 17th versus June 18th to December 31st, 1930), tariffs in our sample increased by 6.7 percentage points, from 19.2% to 25.9%.[10] Of course, this average masks some important distributional changes. Many goods, especially goods that are difficult if not impossible to produce in the US, such as bananas or tea, or important intermediate inputs, such as iron ore or copper, were not affected by tariffs before or after Smoot-Hawley. In our sample of imports, the 75th percentile of the tariff increased by 5.6 percentage points and the 90th percentile by 13.6 percentage points. Figure 1 shows the distribution of changes in tariff at the product level. Some imports show a negative change in the rate, which could reflect reductions in rates, goods with specific tariffs where the import price increased, or products in our sample that had sub-categories and where there were changes in the amount of imports toward sub-categories which were less affected by the tariff of 1930.[11]

We then plot the the average price of imports between January 1929 and June 1932

[10] Because these calculations include goods with specific tariffs, such averages mask the fact that changing import prices change the ad valorem equivalents and should be taken as suggestive evidence. We address this issue more systematically throughout our analysis.

[11] In many cases, those subcategories are not possible to identify before Smoot-Hawley. Many goods received new tariffs by subcategory (for example, by size). In those cases, those subcategories where generally not reported before the change.

Figure 1: The Distribution of Changes in Tariff Rates due to the Smoot-Hawley Tariff

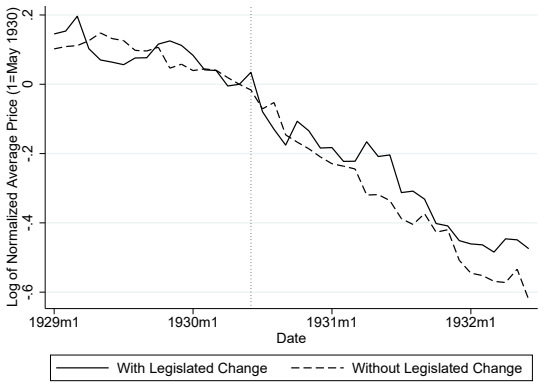


Notes: The histogram shows the change in the ad valorem equivalent rate for a given import, where the rate is compared for the period from January 1, 1930 to June 17th, 1930 to the period June 18, 1930 to December 31st 1931.

based on our sample of 73 principal U.S. imports. Figure 2 shows a clear downward trend, unsurprising since our sample period encompasses the onset and deepening of the Great Depression – a period of severe deflation as noted earlier. Between January 1929 and May 1930, the month prior to passage of Smoot-Hawley, average import prices at the market of origin had declined by 12.3%. Between May 1930 and June 1932, the decline was even more precipitous, with average import prices falling by approximately 55%. Between March 1929 and June 1932, import prices at the market of origin decreased 67.2%. The U.S. wholesale price index fell by 35% between March 1929 and December 1932 and the cost of living index (the precursor to the CPI) fell by 23% over that same period, suggesting that import prices fell by more than overall prices in the economy. Given this downward trend in import, consumer, and wholesale prices, our empirical analysis

of import prices focuses on the relative effects of the tariff act, comparing those imports that experienced positive tariff increases in 1930 versus those that did not. All our empirical specifications thus include time fixed effects, such that we exploit the cross-sectional variation in the intensity of tariffs.

Figure 2: Prices with and without Legislated Tariff Changes



Notes: The figure displays the average relative price change for goods with legislated tariff changes (solid line) and the goods without legislated tariff changes (dashed). Each good's price is first normalized to May 1930. We then compute the average of the log of that normalized price for each group of goods.

We now turn to providing a more systematic analysis of the effects of the Smoot-Hawley tariff on quantities, values, and prices, and estimate models to test for differences in the movements for the two groups of products in our sample before and after its implementation.

3 Estimation and Results

In this section, we present our difference-in-differences (DiD) models and panel event studies to analyze the effects of 1930 tariff code changes on import quantities, values, and prices. Our analysis is at the monthly frequency and spans January 1929 to June 1932 to ensure we have data on quantities and prices for the same set of goods. Be-

cause economists and economic historians view U.S. departure from the gold standard as a regime shift that altered the evolution of U.S. prices (Eichengreen, 1992; Ellison et al., 2024; Temin and Wigmore, 1990), our sample period ends well before the devaluation of the dollar in April 1933 as to avoid any anticipatory effects.

3.1 Measuring changes in tariff rates

To begin, we compute the change in the tariff rate for each product in our sample based on the rate before and after the legislative change that occurred on June 17$^{\text{th}}$, 1930. Specifically, the change in the tariff rate $\Delta Tariff_i$ for article i is defined as

$$\Delta Tariff_i = \log(1 + rate_{i,1930H2}) - \log(1 + rate_{i,1930H1}), \tag{1}$$

where, $rate_{i,t}$ is the amount paid in tariffs for imported article i divided by the total value of imported article i in period t. The period $1930H1$ considers imports from January 1$^{\text{st}}$, 1930 to June 17$^{\text{th}}$, 1930. The period $1930H2$ considers imports from June 18$^{\text{th}}$, 1930 to December 31$^{\text{st}}$, 1930. We measure $rate_{i,t}$ as the ratio of the total tariffs paid by a product i during period t divided by the total value of those imports. For products facing ad valorem tariffs, this yields the exact tariff rate since an ad-valorem tariff is a trade tax assessed as a percentage of the total value of the import. Thus, $\Delta Tariff_i$ is equivalent to the legislated rate change due to the enactment of Smoot-Hawley. However, for specific and combined tariffs, $\Delta Tariff_i$ represents ad-valorem-equivalent change in the tariff. Specific tariffs are trade taxes assessed on the quantity imported, i.e., duties assessed in cents or dollars per physical quantity (pounds, ounces, tons, etc.). Compound tariffs consist of an imported article facing both an ad valorem tariff and a specific tariff. In summary, given the heterogeneity in tariff types that exist in the U.S. tariff code, for the sake of compari-

son, we convert all specific and compound tariffs to their ad valorem equivalents (a rate that is also shown in the government publication from which the data originated and that we digitized).

For specific and compound tariffs, the use of an ad valorem equivalent can generate a time-varying and non-legislated change in the tariff rate if, for example, the import price of product i changes. In instances where the price of imports falls, the ad-valorem equivalent rate for a specific or compound tariff will increase. When using ad valorem equivalent tariffs, it is thus necessary to choose a period over which to average, and comparing the periods immediate before and after the passage of Smoot-Hawley on June 17th, 1930 seemed like a logical baseline given our focus is on comparing pre- and post-1930 enactment effects. In a robustness check shown in the Appendix, we find similar results if we instead consider changes in tariffs between January 1931 and December 1931, confirming that our estimated effects are not driven by different types of tariffs. We also take a more direct approach and present results by tariff type later in the paper, finding no systematic differences between products with ad valorem tariffs and specific or compound (ad valorem plus specific) on the quantity of imports.

3.2 Empirical Specification

Our empirical approach takes advantage of the monthly variation in quantities, values, and prices while still accounting for several important features of changes in trade policy. First, which products received new tariffs in 1930 may be nonrandom — a fact that could influence the magnitudes of measured effects. For example, if 1930 tariff changes focused on elastic goods, the effect on quantities should be large, as well as for prices at the origin, as foreign producers would react to changes in demand. Second, tariffs could have potentially targeted imported items that already had prices that were trending downward.

Third, measured effects could be influenced by seasonality or because certain goods were more sensitive to declining incomes, once the business cycle turned down.

To account for these potential confounders as well as the possibility of pre-trends in our data, we use panel event studies and difference-in-difference estimates with two-way fixed effects. As in Fajgelbaum et al. (2020), examining our data for pre-trends helps to rule out potential anticipation effects and validates the use of tariffs as a source of identification, either to estimate elasticities of substitution with quantities imported or to estimate the effects of the tariffs on prices. Our setting corresponds to the two-way fixed effects case De Chaisemartin and d'Haultfoeuille (2020) characterized as yielding unbiased estimates: all treated groups start receiving the treatment on the same date (June 18, 1930).[12] Specifically, we run regressions which take the following form:

$$\log(x_{it}) = \alpha_t + \gamma_i + \sum_{\tau=1929m1}^{1932m6} \beta^{\tau} I(1\ if\ t=\tau)\Delta Tariff_i + \varepsilon_{i,t}, \tag{2}$$

where x_{it} is either quantities, values or prices of the good i at time t. $I(1\ if\ t=\tau)$ is a variable that takes a value of 1 if the month is t and zero otherwise. $\Delta Tariff_i$ represents the change in tariffs due to the Smoot-Hawley Tariff Act. γ_i is a product fixed-effect and α_t is a time fixed-effect. To control for within-sector substitution effects, we also run a version of this specification using sector-time fixed effects, where the nine sectors are defined by the 1-digit import categories used by the government in the 1930s and described in the data section.[13] Standard errors are clustered at the product level. All coefficients

[12] We run robustness exercises using a binary variable for goods that perceived or not positive tariff changes. We find results consistent with our main findings.

[13] Specifically, these nine import groups are: (1) animals and animal products, inedible; (2) animals and animal products, edible; (3) vegetable food products and beverage; (4) vegetal products inedible; (5) textiles; (6) wood and paper; (7) nonmetallic minerals; (8) metals and manufactures; and (9) chemicals and related products.

are expressed relative to March 1930, the month we set as the baseline.

Our empirical model aims to control for many factors that could potentially bias the estimated effects of tariffs. To avoid aggregate trends or shocks that might affect all prices in the same month, we include a time fixed effect. Our estimates thus explore the cross-sectional variation in the reaction of imported goods to tariffs. For most of our sample period, U.S. exchange rates are fixed vis-a-vis most of its trade partners (almost all countries were on the interwar gold standard at the beginning of our sample period), meaning that US monetary policy will not play an important role in terms of affecting relative prices in exporting countries; however, other aggregate shocks could. Additionally, as mentioned earlier, tariffs could have targeted goods that had experienced larger declines in prices or quantities before the tariff's enactment. We thus measure pre-trends to ensure that our estimates do not capture changes due to potential selection bias.

3.3 Effects on Quantities and Values Imported

Next, we estimate the effects of the Tariff Act of 1930 on imported quantities and values using our monthly data. We estimate models based on equation 2, where the dependent variable is either the quantity or the value of imports. Some specifications include 1-digit-sectoral fixed effects interacted with a time fixed effect. Our sample period spans January 1929 to June 1932. In our specification, we set the baseline period (month) as March 1930 to account for potential anticipation effects of the tariff's enactment.

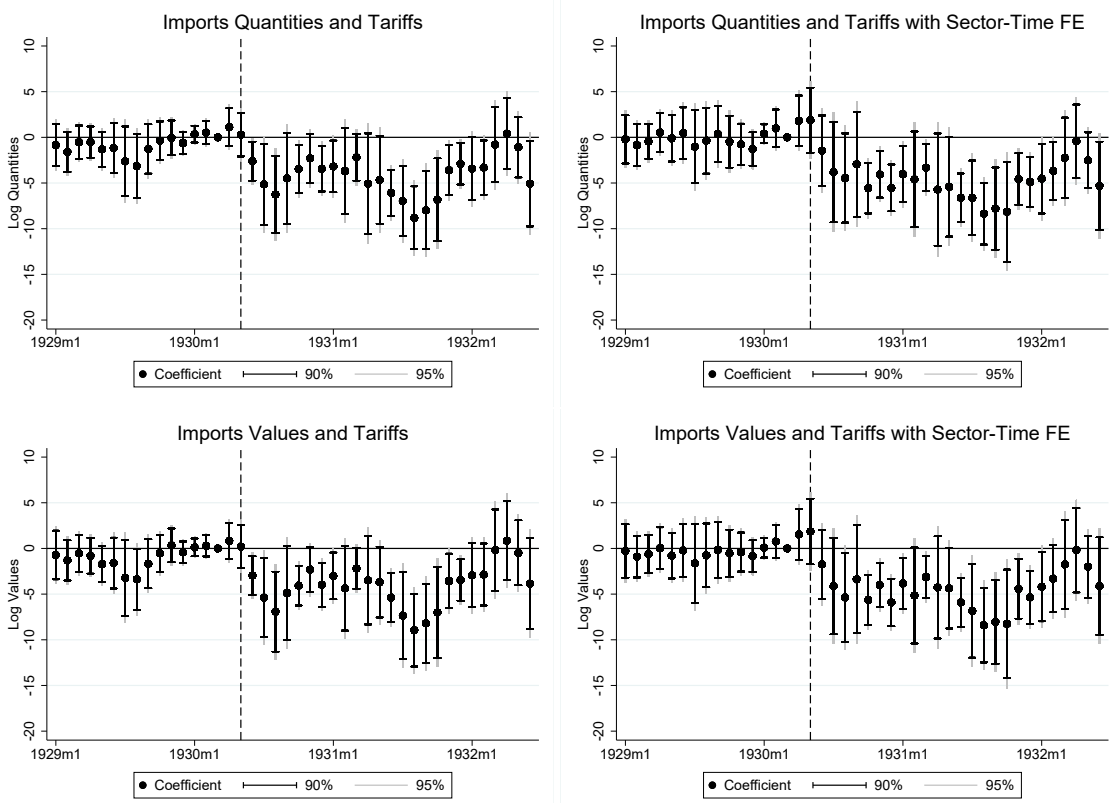
Figure 3 displays event study plots of the estimated effects of Smoot-Hawley tariff rate changes on either (log)quantities in the top two panels or (log) values in the lower two panels. The vertical dashed line again indicates the benchmark month of March 1930. The plotted coefficients for $\Delta Tariff_i$ reveal that both the value and quantity of imports facing new tariffs under Smoot-Hawley fell swiftly and substantially. In June 1930, the month

that tariffs were implemented, the effects of Smoot-Hawley are statistically significant at the 95-percent level and slightly negative on quantities and values; the estimated coefficients are large and negative in the following months, reaching their 1930 nadir in August. Both quantities and values fell by over 6% for every one-percentage point increase in the tariff in August 1930. In specifications including sector-time fixed effects, the imports remain negative and statistically significant through the end of 1930. The decline in the quantity and value of imports fell even more sharply in 1931, with the coefficient peaking at over -8%.

While the coefficients show some cyclicality prior to June 1930, we observe no evidence of persistent upward or downward pre-trends, suggesting that the effects are not influenced by strong anticipatory effects of the enactment of the – a factor that can impact import dynamics (Alessandria et al., 2010). The cyclicality shown in the coefficient is perhaps due seasonal changes in the demand for imports, such as agricultural goods. To adjust for any seasonal factors in the data, we run a regression for each product in our sample with monthly fixed effects. We then obtain the residual of that series and re-run the differences-in-differences regression using this as our *seasonally-adjusted* dependent variable. It should be noted that because seasonality coincides with the timing of the tariff, this exercise could potentially lead to an underestimate the actual effect. Figure 4 shows the results from this exercise.

Figure 4 displays patterns that are similar to those shown in the previous Figures. First, there is a sharp decline in affected imports, measured either by value or quantity, for those imports facing higher tariffs under Smoot-Hawley. This decline then intensifies over time. In comparison to the panels shown in 3, the estimated coefficients are somewhat smaller in magnitude, but still economically meaningful. In our main specification

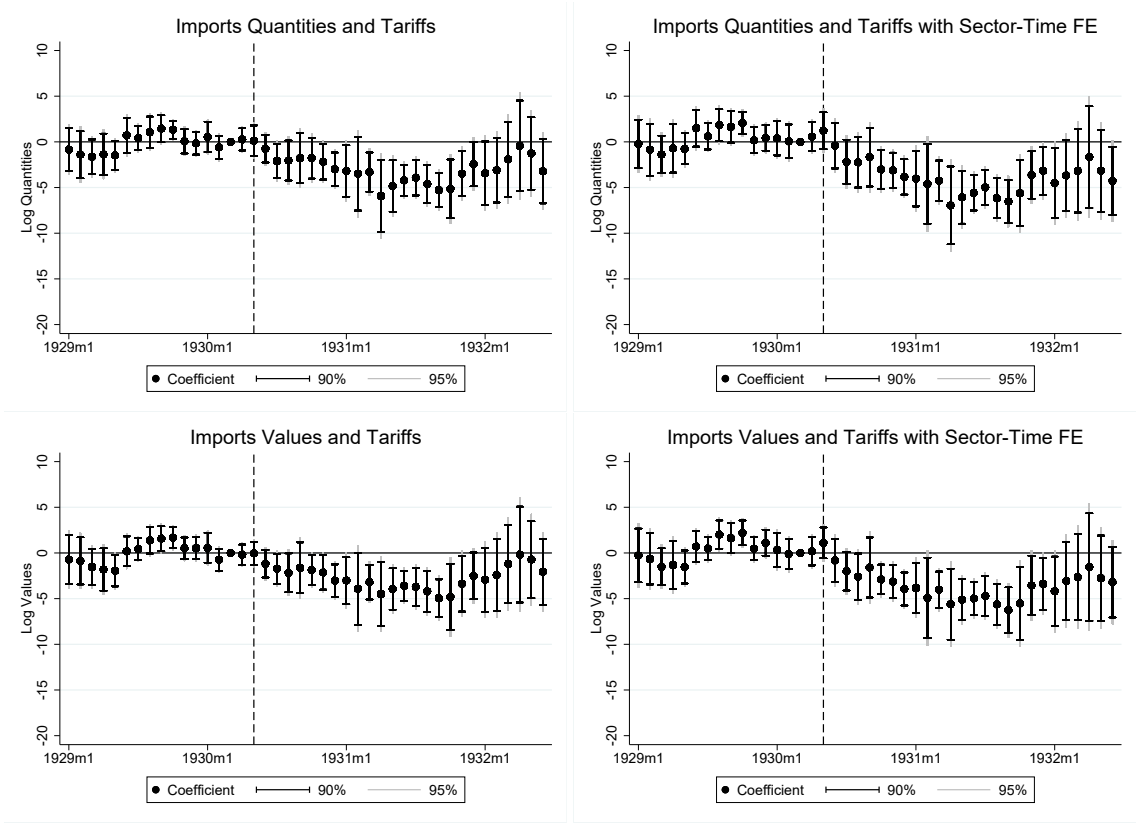
Figure 3: The Effect of the Smoot-Hawley Tariff on Import Quantities and Values



Notes: The figure displays event-study plots based on equation (2), where the dependent variable is either the log quantity of imports (upper two panels) or the log value of imports (lower two panels). The right panel also includes sector-time fixed effects. The baseline period is March 1930 for both graphs as shown by the dashed vertical line. Black dots are estimated coefficients for the change in tariffs as defined in equation (1) interacted with the time fixed effect for each period. The darker lines represent 95-percent confidence intervals and the light gray lines 90-percent confidence intervals. Standard errors are clustered at the product level.

in both quantities and values, the coefficient is close to -5% for almost all of 1931, and then starts to increase around September 1931, when the UK and other main US trade partners abandoned the gold standard. As before, the effects tend to be more pronounced when sector-time fixed effects are included. For quantities, the coefficient bottoms out at -5.9% in April 1931.

Figure 4: The Effect of the Smoot-Hawley Tariff on Import Quantities and Values Adjusting for Seasonality



Notes: The figure shows estimates of equation (2), where the dependent variable is either the log quantity of imports (upper panels) or the log value of imports (lower panels). The right panels include sector-time fixed-effects. All variables are seasonally adjusted, by taking the residual of regression with month fixed effect at the product level. The baseline period is March 1930 for both graphs. Black dots are coefficient for the change in tariffs as defined in equation (1), interacted with the time fixed effect each period. The darker lines represent 95- percent confidence intervals and the light gray lines 90- percent confidence intervals. Standard errors are clustered at the product level.

The large estimated coefficient on quantities can be explained by the characteristics of the Tariff Act of 1930: its aim was to protect domestic industry. In that sense, it targeted goods with higher elasticities of substitution, with domestic producers responding to the tariffs by ramping up their production. In fact, as discussed in Section 2.1, key inputs of production, such as copper or petroleum, and goods not produced in the US,

such as bananas, were generally not tariffed. On top of that, the timing of the reform could be non-random, since by the time of its passage, some sectors of the economy were already contracting, making the act's passage and the products that received new tariff rates potentially endogenous to the economic cycle. However, as argued in research on other tariff episodes (Fajgelbaum et al., 2020), the absence of pre-trends indicates that no product characteristics predicts the change in the duty under Smoot-Hawley, and reduces concerns about these types of confounding factors.

That said, we address any remaining endogeneity concerns using an instrumental variables approach. We follow the approach of Goldberg and Pavcnik (2005) and Amiti and Konings (2007) and use the pre-existing tariff level as an instrumental variable. In our setting, existing tariff rates are likely unrelated to any issues that industries or sectors faced between October 1929 and May 1930, and may also factors that are pre-determined and unrelated to the reasons for protection in 1930. With that instrument, we want to reassure that the tariffs affect the demand of the product directly, and not that tariffs are introduced, because of some conditions that were happening to those markets due to the Depression. For example, in our sample, tobacco leaves have the largest tariff rate in our sample. This high rate could be explained by other considerations, such as Pigouvian reasons or inelastic demand, that could offset selection toward high-elasticity-of-substitution goods. Figure **??** in Appendix B shows the first stage regression and Table A.7 in Appendix A shows that the instrumental variables estimates are similar to those using OLS. These IV estimates, combined with our examination of pre-trends reduce concerns regarding specific demand shocks explaining the estimates. Even with these considerations, tariff rates are likely biased toward high elasticity of substitution goods, which is important to keep in mind when comparing with other tariff reforms, but also are a char-

acteristic we want to consider when evaluating the welfare implications of the Tariff Act.

3.3.1 Heterogeneity by Type of Tariff

Next, we explore heterogeneous effects by types of tariffs found in the tariff schedule of the 1930s. In our sample, some imports faced ad valorem tariffs, computed as a constant proportion of the value while other imports faced specific tariffs which, for a given quantity imported, have a constant dollar value (e.g., 12 cents per pound). Since specific tariffs are nominally rigid, their ad valorem equivalent rates change as the price of the tariff article increases or decreases over time (Eichengreen, 1989; Irwin, 1998a; Chakarbarty et al., 2025; Greenland and Lopreseti, 2022). As noted earlier, our sample period coincides with a general period of deflation, meaning that the ad valorem equivalent of specific tariffs generally increased. To account for this tariff heterogeneity, we run the following regression:

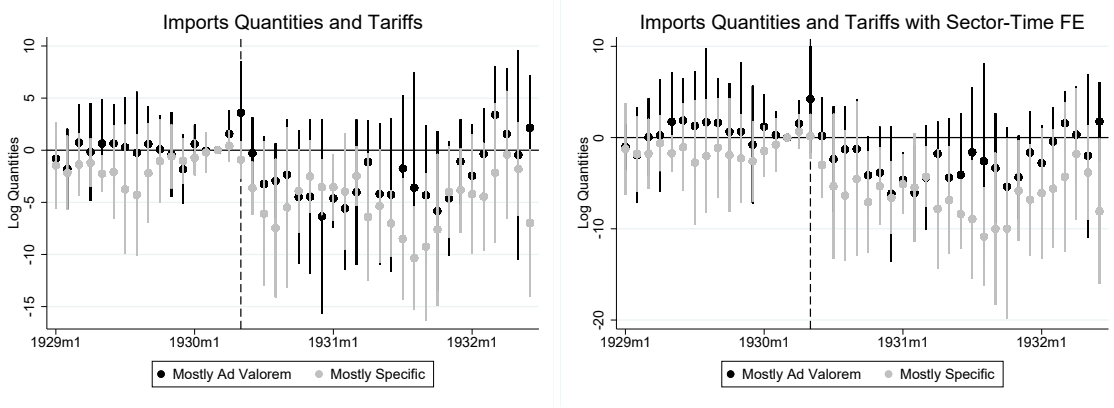
$$\begin{aligned}\log(Q_{it}) = \alpha_t + \gamma_i + \sum_{\tau=1929m1}^{1932m6} \beta_{AV}^{\tau} I(1 \text{ if } t=\tau)\Delta Tariffs_i \times Sh_{AV,i} \\ + \sum_{\tau=1929m1}^{1932m6} \beta_{Q}^{\tau} I(1 \text{ if } t=\tau)\Delta Tariffs_i \times (1 - Sh_{AV,i}) + \varepsilon_{i,t},\end{aligned} \tag{3}$$

where Sh_AV_i is the share of the tariff that is ad valorem. This measure lies between zero and one, as some imports in our sample were assessed a combination of ad valorem and specific tariffs. Q_{it} is the quantity imported of product i at time t.[14] Figure 5 shows that there are no statistically significant differences based on the type of tariff, even in 1931 when the effects of specific tariffs were operating more strongly due to more severe deflation.

This result remains unchanged when we remove monthly cyclicality from the data. In

[14] We also consider tariff heterogeneity using import values as the dependent variable. Figures B.2 and B.3 in Appendix B show the results.

Figure 5: The Effect of the Smoot-Hawley Tariff on Import Quantities by Type of Tariff



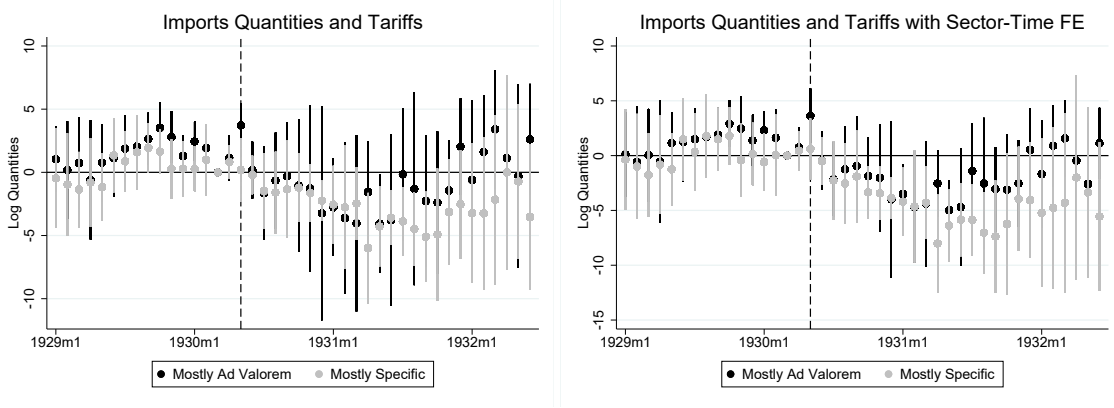
Notes: The figure shows estimates of (3), where the dependent variable is the log quantity. The right panels also include sector-time fixed effects. For both figures, the baseline period is March 1930. Dots are coefficients for the change in tariffs as defined in equation (1) interacted with the time fixed effect each period. Black dots are for the interaction with the share of ad valorem tariffs and gray are for the share of specific tariffs. Lines represent 95-percent confidence intervals. Standard errors are clustered at the product level.

fact, when we use the average rate of tariffs by 1931, in Figure 6, we see a stronger initial effect for ad valorem tariffs and a more delayed effect of quantity tariffs. In general, we do not observe systematic differences depending on the type of tariffs.

3.4 Did Import Prices Change in Response to the 1930 Tariff?

Using the sources described above, we now turn to estimating the effects of tariffs on prices at the market of origin to shed light on the incidence of the Smoot-Hawley Tariff. Using quantities of imports and total values of imports, we can also obtain unit values (i.e., average prices) and compare them to the monthly prices at the port of origin. We use this comparison as a check on the accuracy of our data imputation between the price and quantity data. In Appendix C, we show different exercises that confirm a strong time series correlation between the implied prices (i.e., unit values) and the average price at the port. This relationship confirms that our imputed categories are accurate, so we can

Figure 6: Effect by Type of Tariff without monthly cyclicality



Notes: The figure shows estimates of (3), where the dependent variable is the log quantity. The right panels also include sector-time fixed effects. All variables are seasonally adjusted, by taking the residual of the regression with month fixed effects at the product level. For both figures, the baseline period is March 1930. Dots are coefficients for the change in tariffs as defined in equation (1) interacted with the time fixed effect each period. Black dots are for the interaction with the share of ad valorem tariffs and gray are for the share of specific tariffs. Lines represent 95-percent confidence intervals. Standard errors are clustered at the product level.

use the price data to obtain results for the same products that we estimated for quantities. Additionally, it confirms that our tariff imputation is correct.

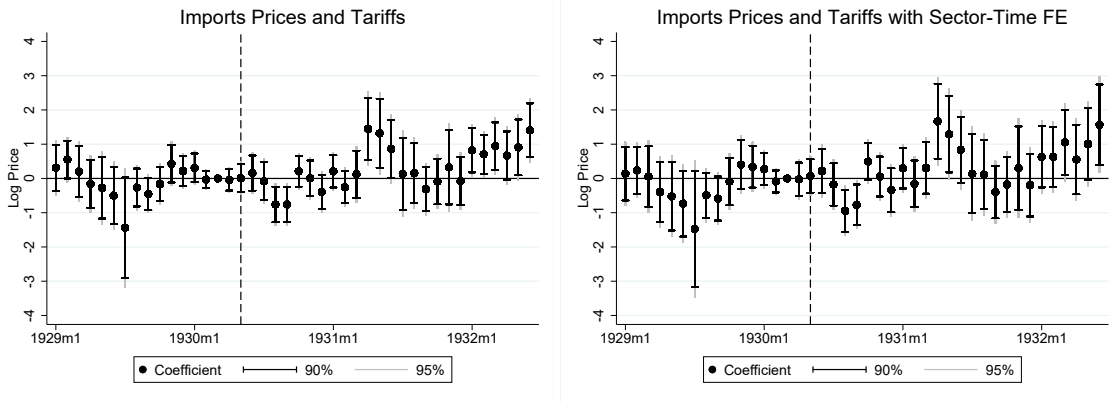
Based on Equation (2), if we observe a null effect on the coefficient $\Delta Tariff_i$, that would imply full pass-through of the tariff into domestic prices, either to U.S. producers or consumers. On the other hand, if we find a negative and statistically significant effect on $\Delta Tariff_i$, that would indicate that the tariff is partially absorbed by the producer in the country of origin, implying that some of the incidence of the tariff is being borne by foreign producers. In the extreme case, a coefficient of -1, would imply that producers in the market of origin are absorbing the full amount of the tariff by lowering their export prices by an amount equivalent to the tariff.[15] In this case, the price faced by producers

[15] As mentioned earlier, during our sample period, most US trade partners were on the gold standard and had fixed exchange rates relative to the US dollar. While our prices are measured in US dollars, given this constant parity, we interpret the result as the price faced by the foreign producer.

and households in the US would not rise.

Figure 7 displays the event study plots based on estimating equation 2. The dashed vertical line indicates March 1930, as in earlier figures. The left panel includes month and product fixed effects while the right panel also includes sector-time fixed effects. Although there are some statistically significant movements in $\Delta Tariff_i$ in 1929, there is no evidence of a clear trend. Starting in November 1929, we find no pre-trend in the coefficient of interest,$\Delta Tariff_i$, and we observe a generally stable trajectory between the treated and control groups of imports before the enactment of Smoot Hawley.

Figure 7: Tariffs effect on Import Prices



Notes: The figure shows estimates for equation (2), where the dependent variable is the log price of imports. The right panel include sector-time fixed effects. The baseline period is March 1930 for both graphs. Black dots are coefficient for the change in tariffs as defined in equation (1) interacted with the time fixed-effect each period, the darker lines represent 90-percent confidence intervals and the light gray lines 95-percent confidence intervals. Standard errors are clustered at the product level.

Interestingly, we observe no difference in the prices of imports that had Smoot-Hawley tariffs versus those that did not in the month of the implementation of the tariff or in the following month. However, in August and September 1930, we observe a statistically significant and large, negative coefficient of approximately -0.75 relative to the baseline

month of March. This coefficient's size implies that in these two months, roughly 75% of the average tariff rate increase was being offset by foreign producers lowering their product prices. However, their tolerance for doing so appears to have been short lived. By October 1930, the change in price of firms with tariffs revert to zero, implying full pass-through of the tariff to American firms or consumers. No doubt, falling global commodity and manufacturing prices may have made it challenging for foreign producers to cut prices and absorb the cost of the Smoot-Hawley tariff.

As a robustness exercise, we also estimate the same equation but instead define the change in each product's tariff through the end of 1931, thus allowing products with specific and compound tariffs to respond to any changes in prices for a longer period of time. Figure B.1 in Appendix B shows the same short-run negative effect on exporters' pre-tariff prices in August and September 1930. And as before, this negative effect does not persist. By October 1930, it appears that foreign producers were, once again, unwilling to absorb the tariff hikes; thereafter, there was complete pass-through to American producers and households.

3.5 Average Effects of Smooth-Hawley on Quantities, Values and Prices

In order to have a sense of the average effect of changes in tariffs on quantities and values, we estimate the following regression using our monthly data:

$$\log(x_{it}) = \alpha_t + \gamma_i + \beta I(1\ if\ t \geq 1930m6)\Delta Tariff_i + \varepsilon_{i,t}, \tag{4}$$

where variables are defined as in equation (2), except that now the change in tariff is interacted with a dummy that is zero before June 1930 (the month when Smoot-Hawley went into effect) and equal to one thereafter. As in the previous exercise, in some regres-

sion specifications, we include a sector fixed effect interacted with the time fixed effect, meaning we are exploiting within-sector variation. Table 2 shows the effects of tariffs on quantities, values, unit values and prices at the border (i.e., the import prices used above). Unit values are prices calculated by dividing the total value of import i in month t by the quantity of import i in month t.

Table 2: Effects of Tariffs on Quantities, Values, Unit Values and Prices

	Quantity		Value		Unit Value		Price at the Border	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\Delta Tariff_i$	-3.428***	-4.715***	-3.195***	-4.381***	0.230	0.330	0.383	0.490
	(0.910)	(0.867)	(0.915)	(0.947)	(0.409)	(0.406)	(0.375)	(0.397)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Product FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector-Time FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	3,066	3,024	3,066	3,024	3,066	3,024	3,066	3,024
R-squared	0.931	0.943	0.852	0.879	0.991	0.992	0.992	0.993

Notes: Table shows estimates of equation (4) between January 1929 to June 1932. For quantities (Columns (1) and (2)), values (Columns (3) and (4)), unit values (Columns (5) and (6)) and prices at the border (columns (7) and (8)). Sector FE is a 1-digit sector fixed effect. Standard errors clustered at the product level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Our results confirm the previous effects for all variables. In particular, we find that a one-percentage point increase in the tariff rate in 1930 reduced the quantity of imports by an average of -3.43 percent relative to imports which were not tariffed under Smoot-Hawley. This effect consider some of the fluctuations saw in the time-series exercise, but confirms a relatively large substitution between goods in the medium run. The price elasticity of demand is considerably larger when the regression includes sector-time fixed effects (column 2). Smoot-Hawley's effects on imports were large, but appear to be consistent with other more recent examples of trade protection (Amiti et al., 2019). Columns 3 and 4 show the results for values. In terms of absolute values, the estimates for the value

of imports are slightly smaller than quantities. This comparison implies a positive unit value effect, which is confirmed in columns 5-8 using wholesale prices at the border as well as unit values; however, in all four estimates for prices, the effects on are not statistically significant. Even though the price effects are noisily measured, it is clear they are not negative. Therefore, as discussed earlier, we can reject the possibility of a significant absorption of the tariff by foreign producers: the tariff was passed through to domestic consumers and firms.

Tables A.5 and A.6 in Appendix A confirm these results using annual data. The measured effects using annual data are similar for 1930H2 and 1931, but slightly larger in absolute value, -4.3 in 1930H2 and -4.1 in 1930. That said, the periods are not perfectly comparable with the monthly data, with the effects for 1930H2 (Table 2) using a larger pre-period and because June 1930 is classified as fully treated. In Tables A.5 and A.6, June is separated before or after tariff. Considering the different specifications, we estimate an effect of tariffs on quantity imported of between -3.43 and -4.25 percent, during the first 12 to 18 months. We use these values when computing the welfare effects of the Smooth-Hawley tariffs.

In summary, our findings suggest that the Smoot-Hawley tariff led to large reductions in the quantity of imports and price movements that are consistent with full pass-through to U.S. consumers and producers.

4 Examining the Measured Trade Elasticity

Our empirical analysis estimates the effect of tariffs on quantities and prices. For imports facing new tariffs under Smoot-Hawley, we find large and quite quick reductions in the quantity imported relative to those imports that did not receive new tariffs, and

null effects on prices one quarter after enactment. Our setting allows us to measure these effects while controlling for aspects that other empirical settings cannot. In particular, tariffs were clearly announced and were not followed by additional changes in the tariff code. Moreover, they were implemented when most countries and almost all U.S. trade partners had fixed exchange rates and participated in the interwar variant of the gold standard. We now discuss how these features of our setting allows us to estimate meaningful parameters.

Other works, most notably Boehm et al. (2023), estimate the effect of tariffs on quantities in the short and long run. Similar to our research, they estimate the effect within the first year, finding elasticities roughly equal to unity. There are, however, some important differences when comparing our empirical setting to theirs. Mainly, the changes in tariffs we study occur at the product level and do not depend on the country of origin. Their research estimates a trade elasticity broadly defined, which in some models corresponds to one minus the elasticity of substitution across varieties produced in different countries. Under standard nested CES preferences, the elasticity of substitution between the same product produced in different locations is typically higher in absolute value terms than the elasticity between different types of goods.

Another feature of our setting that differs from previous studies is that the changes in the product-level tariffs are large and generally positive, targeting protection of local producers, i.e., not occurring in the GATT and WTO era when tariff rates were generally negotiated downward. The rise in rates in the 1930s was no doubt related to the politics of Smoot-Hawley (as discussed in Section 2), could imply tariffs that are selected based on goods with larger elasticities of substitution, and potentially explain the large (absolute

value) price elasticity of demand that we observe in our empirical results.[16] That said, this setting is still of general interest since, as we are seeing in the 21st century again, most tariff increases arise from similar political motives.

With these features of our setting in mind, our results provide measures of the short-run and medium-run trade elasticities. Given short run dynamics of prices and monetary policy, these elasticities can depend on many factors. In Appendix E, we develop a New Keynesian model with trade across countries to account for the variables affected by tariffs and to study how quantities react in the short and long run. Similar to Boehm et al. (2023), we obtain equations that allow us to characterize the effects of tariff changes and to clarify which structural parameters our empirical setting identifies. Our framework makes some simplifying assumptions. In our model, each country produces a different variety under CES preferences and tariffs are assessed on a variety produced at the country level. This assumption gives us flexibility to account for the effects of movements in exchange rates, but can easily be adapted to a setting where have tariffs vary both by country of origin and product.[17] In our setting, price setting from firms and local monetary policy will play a role, which will give us a general picture of the different components that can affect the measured elasticity.

Using the household intratemporal condition between locally produced and foreign varieties, we obtain the following condition:

$$\frac{c_{ijt}}{c_{iit}} = \left(\frac{p_{it}}{p_{jt} e_{ijt} (1 + \tau_{ijt})} \right)^{\sigma}, \tag{5}$$

[16] Additionally, the lack of adjustment in prices at the market of origin could indicate higher foreign elasticity of supply.

[17] For example, in our model, we could assume some foreign regions are in a monetary union and relax labor market frictions between economies.

where c_{ijt} is the quantity consumed in economy i of the variety produced in economy j at time t, i.e. imports of good j by i. c_{iit} represents domestic consumption of the locally produced variety at time t. p_{jt} is the producer price of the good produced in country j where e_{ijt} is the exchange rate between country i and j expressed in currency i, and τ_{ijt} denotes the tariff imposed by i on goods produced in j.

The regression estimating the effect of tariffs on import quantities (in our case, equation 4) can be represented in the model as taking logs of equation (5) and then differentiating over the change in the tariff rate. Specifically, we can express that as:

$$\frac{d\ln c_{ijt}}{d\ln(1+\tau_{ijt})} = \frac{d\left(\ln c_{iit} - \sigma \ln p_{it}\right)}{d\ln(1+\tau_{ijt})} - \sigma\frac{d\ln p_{jt}}{d\ln(1+\tau_{ijt})} - \sigma\frac{d\ln e_{ijt}}{d\ln(1+\tau_{ijt})} - \sigma\frac{d\ln(1+\tau_{ijt})}{d\ln(1+\tau_{ijt})}, \quad (6)$$

and relative to the effect on a control group k:

$$\frac{d\ln c_{ikt}}{d\ln(1+\tau_{ijt})} = \frac{d\left(\ln c_{iit} - \sigma \ln p_{it}\right)}{d\ln(1+\tau_{ijt})} - \sigma\frac{d\ln p_{kt}}{d\ln(1+\tau_{ijt})} - \sigma\frac{d\ln e_{ikt}}{d\ln(1+\tau_{ijt})} - \sigma\frac{d\ln(1+\tau_{ikt})}{d\ln(1+\tau_{ijt})}. \quad (7)$$

As shown by these equations, the effect on domestic consumption and domestic prices, $\frac{d(\ln c_{iit} - \sigma \ln p_{it})}{d\ln(1+\tau_{ijt})}$, enters symmetrically in both expressions. With time fixed effects, this common component is absorbed and therefore cancels out in the main regression. We also have that $\frac{d\ln(1+\tau_{ijt})}{d\ln(1+\tau_{ijt})} = 1$ and $\frac{d\ln(1+\tau_{ikt})}{d\ln(1+\tau_{ijt})} = 0$. The estimated effect is thus given by the difference between the two equations:

$$\begin{aligned} &\frac{d\ln c_{ijt}}{d\ln(1+\tau_{ijt})} - \frac{d\ln c_{ikt}}{d\ln(1+\tau_{ijt})} = \\ &-\sigma\left(\frac{d\ln p_{jt}}{d\ln(1+\tau_{ijt})} - \frac{d\ln p_{kt}}{d\ln(1+\tau_{ijt})}\right) - \quad \sigma\left(\frac{d\ln e_{ijt}}{d\ln(1+\tau_{ijt})} - \frac{d\ln e_{ikt}}{d\ln(1+\tau_{ijt})}\right) - \sigma. \end{aligned} \quad (8)$$

As shown by this expression, the cross-sectional effect of tariffs on imports, relative to imports not affected by tariffs in the short run, is equal to minus the elasticity of substitution plus terms capturing relative price adjustments and relative exchange rate movements.

In our empirical setting, we are able to estimate some of these components directly while controlling for the others. First, in Section 3.4, we estimate the effect of tariffs on the prices for imported goods affected and not affected by tariffs, which allows us to identify $\left(\frac{d\ln p_{jt}}{d\ln(1+\tau_{ijt})} - \frac{d\ln p_{kt}}{d\ln(1+\tau_{ijt})}\right)$. We find estimates close to zero, suggesting that this component is likely small in our setting. Second, as mentioned earlier, the Tariff Act of 1930 was implemented when almost all US trading partners were on the gold standard. As a result, exchange rates were largely fixed at the time the Tariff Act of 1930 was implemented.

That said, a small number of US trade partners had floating exchange rates (Spain) or were on the silver standard (China and Hong Kong), implying that bilateral rates vis-a-vis the USD could change during our sample period. Additionally, in September 1931, Great Britain, a large trade partner of the US, abandoned the gold standard and devalued. Although Britain's departure from gold was driven by events in Europe (including contagion from the Credit Anstalt banking crisis) and not the Tariff Act of 1930, we nevertheless consider the possibility that it might still have somehow influenced US imports that experienced significant increases in their tariff rates, and thus changing the expression $\left(\frac{d\ln e_{ijt}}{d\ln(1+\tau_{ijt})} - \frac{d\ln e_{ikt}}{d\ln(1+\tau_{ijt})}\right)$ to something other than zero. In order to test for this possibility, we evaluate the correlation between a product level exchange rate, weighted by the importance of the destination and the change in tariffs.

As a first step, we construct a trade-weighted exchange rate for each imported article in our sample, where the weights are fixed by the share of the imported article from each

destination pre-Smoot-Hawley. In particular, the weighted exchange rate wer is calculated as:

$$wer_{it} = \sum^{D} \omega_{id,1929} \times er_{d,t},$$

where ω_{di} is the share of imports of good i coming from destination $d \in D$ in 1929 and $er_{d,t}$ is the nominal exchange rate of destination d at time t (foreign currency/USD). To make it comparable, we normalize each exchange rate to be equal to 1 in January 1929. WER_{it} represents a product-based, time-varying exchange rate analogous to the city-level, weighted exchange rate used in Candia and Pedemonte (2025).

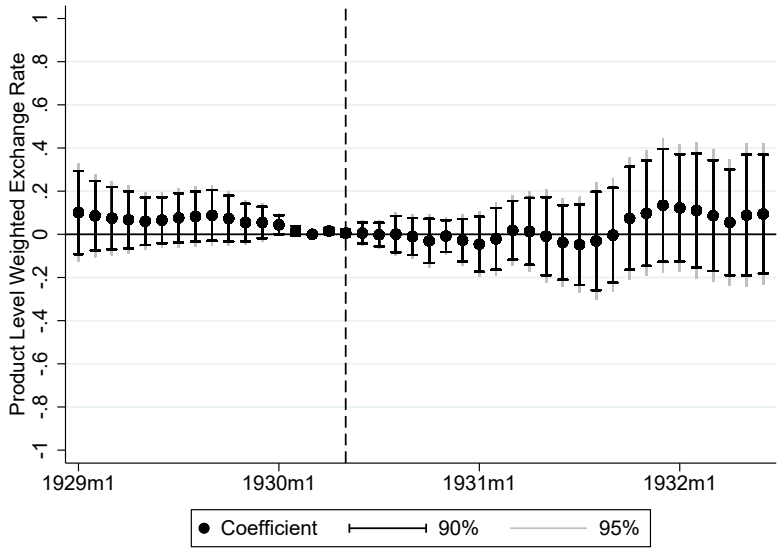
Next, we re-estimate equation 2, where the dependent variable is wer_{it}.

Figure 8 displays the results. we see a mild appreciation of the US dollar starting in October 1929. Changes are not statistically different from the coefficient in the baseline period. Relative to countries on gold (including the US), trade partners, such as China and Spain, saw their currencies depreciate relative to the dollar beginning in October 1929. For example, rice, which was mainly imported from Hong Kong, experienced an important relative appreciation and also an increase in its tariff rate in 1930. According to equation 8, this appreciation should have reduced the measured effect of tariffs on imports.

Generally, Figure 8 shows that exchange rate effects pre-Smooth Hawley period are generally muted, and roughly equaling zero over our entire sample period. Similarly, we can see that the events after October 1931, when the UK and other countries left the gold standard did not have a significant effect on imports in terms of exchange rate.

Given the data suggest small effects of the Smoot-Hawley tariff on both import prices and exchange rates, our empirical estimates of the effect of tariffs on quantities can be interpreted as identifying an elasticity of substitution that varies between -3.4 and -4.1,

Figure 8: Tariffs and Nominal Exchange Rate



Notes: The figure shows estimates for equation (2), where the dependent variable is wer_{it}, as defined in the text. The regression includes sector-time fixed effects. The baseline period is March 1930. Black dots are the estimated coefficients for the change in tariffs as defined in equation (1), interacted with the time fixed-effect each period. The darker lines represent 90-percent confidence intervals and the light gray lines 95-percent confidence intervals. Standard errors are clustered at the product level.

consistent with trade elasticities obtained in other settings, such as Caliendo and Parro (2015).[18]

Compared to findings such as those in Boehm et al. (2023), we estimate a relatively larger trade elasticity (in absolute value terms) for the short run. Our model provides a potential explanation for this difference: the exchange-rate channel. Recall that our short-run trade elasticity is measured when the US and its trade partners adhered to fixed exchange rates. As emphasized by Candia and Pedemonte (2025) for this period and by Jeanne and Son (2024) more generally, exchange-rate adjustments can partially offset the effects of tariffs in the short run, leading to lower measured reduced-form trade

[18]The trade elasticity is generally defined as $1 - \sigma$; hence it is between 4.4 and 5.1.

elasticities. In our setting, exchange-rate movements are muted due to the interwar gold standard. Figure E.6 in Appendix E shows how the measured elasticity of substitution between goods would look in the model, with and without fixed exchange rates. We can see that in the model with fixed exchange rates, the difference between the effect of treated (or newly "tariffed") imports relative to the control group of imports is large and that the elasticity of substitution between varieties is close to -4. Figure E.7 in Appendix E illustrates how the effect of tariffs figures into this measured difference, and as expressed in Equation 8, using $\sigma = 4$. We can see that a combination of sticky prices and exchange-rate movements can generate a smaller measured trade elasticity in settings with a flexible exchange rate, even with an almost complete pass through of tariffs into domestic prices. In our historical setting, we estimate large effects of trade on the quantity of imports. In the short-run, when prices and exchange rate are fixed, our estimate measures the elasticity of substitution between varieties.

Consistent with this mechanism, we observe a similar role for exchange rates in the data. Figure 4 shows that the effect on quantities reaches its lowest value around April 1931 and remains near -5 until September 1931, after which the coefficient begins to decline in absolute value terms. September 1931 coincides with the Great Britain's exit from the gold standard, followed by several other countries with close political and economic ties to Great Britain. Canada, the main US trading partner at the time, adopted an exchange rate regime linked to both the US dollar and the UK pound, resulting in an effective depreciation of the Canadian Dollar relative to the dollar. Japan devalued in December 1931. These important trade partners' devaluations could explain the estimated dynamics shown in the figure.

In Appendix E, we also discuss how the effect of tariffs on quantities can vary depend-

ing on the characteristics of the economy, including the size of trade relative to GDP and the degree of pass through. At the limit, in a small open economy setting, the effect of tariffs on quantities is exactly equal to the elasticity of substitution between varieties since foreign prices are not affected by tariffs and the exchange rate is fixed.[19]

4.1 Welfare Analysis

Our empirical results on prices and quantities allow us to estimate the elasticity of substitution between imported varieties, a key parameter for understanding the aggregate effects of tariffs. Moreover, our empirical setting allows us to estimate this elasticity free of monetary-policy effects that otherwise might change the estimated elasticity in the short run. Combining this elasticity with information on US GDP, imports, and tariff revenue allows us to estimate the welfare effects of the Tariff Act of 1930.

As we saw earlier, since the effect of the tariff on foreign producers' prices is close to zero and there is no exchange rate effect, we can compute a partial-equilibrium estimate of the welfare loss due to the Smoot-Hawley Tariff as in Amiti et al. (2019). That is, we calculate the standard deadweight loss due to the Tariff Act of 1930 using the observed values of tariffs before enactment, the change in tariff rates, and the elasticity of tariffs with respect to quantities. Following the procedure in Amiti et al. (2019), we first estimate an elasticity of the change of tariffs with respect to quantities of between -3.43 (Table 2) and -4.25 (Table A.5). Additionally, in Section 2.1, we document a change in the average rate of tariffs due to Smoot-Hawley of roughly 6 percentage points. Given these estimates, we compute that the deadweight loss due to the tariff is between 21% and 26%

[19] In a small open economy setting with complete markets, foreign interest rates are not affected by tariffs. So, the exchange rates between the local economy and the two large economies are determined in the same way by the local interest rate. Therefore, the relative exchange rate between the local economy and the two large, foreign economies is fixed, independent of the monetary local policy setting. Because relative prices and the exchange rate do not change, the effect of tariffs on quantities is always equal to the elasticity of substitution between varieties.

of the baseline or pre-Smoot-Hawley value of imports. According to the 1929 edition of the *Foreign Commerce and Navigation of the United States*, the US imported 4.338 billion dollars in merchandise for consumption in 1929. Using this value for imports, we obtain a deadweight loss of between 0.893 and 1.106 billion dollars, which represents between 0.86% and 1.068% of 1929 GDP, respectively. This deadweight loss should be compared to tariffs revenue over GDP. By 1931, tariff revenue was 0.49% of GDP (0.56% in 1929).

Our empirical estimates can be used to estimate the welfare implications of tariffs, using structural approaches, such as Arkolakis et al. (2012). They show that, in a wide range of models, the gains from trade depend only on the change in the share of domestic expenditure and the trade elasticity. Our estimated trade elasticity allows us to apply their methods for computing welfare to the Smoot-Hawley era. Table 1 in Section 2.1 provides the other relevant data for this welfare calculation. In 1929, the share of imports over GDP was 4.2 percent. After the tariffs were implemented, in 1931, the share of imports over GDP declined to 2.1 percent. Following Costinot and Rodríguez-Clare (2014), the initial gains from trade were small, between 0.81% and 0.96%.[20] Considering the changes in domestic expenditure, the imposition of Smoot-Hawley reduced welfare by between 0.29% and 0.34% of GDP. We can also consider the effect of revenues using these exercises using the numbers documented in this paper. In that case, revenue declined from 0.56% of GDP to 0.49% of GDP. When also accounting for this decrease in revenue, welfare declined by about 0.39% after Smoot-Hawley was enacted (between 0.36% and 0.42%).[21]

[20] According to Costinot and Rodríguez-Clare (2014), gains from trade relative to autarky can be estimated using the formula $1 - \lambda^{\varepsilon}$ where λ is the share of expenditure in domestic goods and $\varepsilon = 1 - \sigma$ is the trade elasticity, equal to 1 minus the elasticity of substitution across varieties, in our case between -3.43 and -4.25 according to column (1) of Table 2 and A.5. We use as a proxy of λ the one minus the share of imports over GDP, using values of Table 1.

[21] In this case, we use the Costinot and Rodríguez-Clare (2014) approach using $\frac{(1-\pi)}{(1-\pi')}\hat{\lambda}^{-\frac{1}{\varepsilon}}$. Where $\hat{\lambda}$ is the change in the change of expenditure in domestic goods. π is the original tariff revenue over income and π' the new tariff revenue over income. We use values of Table 1 and our estimate of the trade elasticity.

Both of these approaches show that the welfare effects of Smoot-Hawley were modest. This reflects the combination of a relatively large elasticity of substitution and the fact that the US was relatively closed at the time, i.e., trade was a small share of GDP. In this context, Smoot-Hawley likely reduced a significant proportion of the already small gains from trade.

5 Conclusion

Smoot-Hawley continues to be invoked by policy makers today as the last example of a dramatic increase in U.S. tariffs. Although it is arguably the most researched and discussed trade policy in American history, surprisingly, some of its key effects are still not well understood.

Newly-digitized monthly data on quantities, values, and import prices (at the port of entry) allows us to shed light on several questions of importance. First, using event studies and diff-in-diff models, we estimate the effects on quantities, values, and prices. We find a relatively quick and large average decline in the quantity of imports that were subjected to tariff increases under Smoot-Hawley. In terms of prices, controlling for time, sectoral, and tariff-type fixed effects, we find that by the third month after its introduction, there was nearly complete pass-through to U.S. consumers and firms. Second, similar models show that the effect on the quantity of imports was large. At their nadir in the first year after Smoot-Hawley was enacted, for each one percentage point increase in tariffs, imports fell by about 8% relative to imports that did not face tariff changes in 1930.

Our study also sheds light on key parameters of interest in the trade literature. Given that Smoot-Hawley was the only tariff change enacted during our sample period and we have monthly data that spans several years after its enactment, we exploit the substan-

tial changes in tariffs at the product level to estimate short-run and medium-run trade elasticities. Moreover, given the U.S. had fixed exchange rates with almost of its trade partners for the two years after enactment, we are able to measure elasticities that are largely purged of the effects of shocks to monetary policy. In our setting, we find a short-run trade elasticity of between 4.4 and 5.3, which is higher than the most recent estimates using trade policy have reported. Using a simple, New Keynesian model, we show that exchange-rate movements driven by changes in monetary policy can partially offset the effects of tariffs in the short run, explaining the lower measured reduced-form trade elasticities found in other empirical settings.

Using these estimates, we evaluate the welfare implications of the Tariff Act of 1930. The low share of imports and the large estimated trade elasticity imply modest welfare costs from the increase in tariffs in 1930. The large trade elasticity can be explained by the fact that Smoot-Hawley tariffs, while large, mainly targeted goods that could be substituted with U.S. production. More recent tariff changes are of similar magnitude, but broader in terms of the products affected, and therefore may generate larger welfare effects due to lower substitutability and a larger expenditure share on foreign goods compared with the shares observed in 1930.

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Appendix

A Additional Tables

Table A.1: Product List

Product Name	τ_{1930H1}	τ_{1930H2}	$\Delta\tau$	% AV	% S	Product Name	τ_{1930H1}	τ_{1930H2}	$\Delta\tau$	% AV	% S
1. Animals and Animal Products , Edible						5. Textiles					
Beef and veal, fresh	0.30	0.50	0.20	0.00	1.00	Unman. Cotton	0.00	0.02	0.02	1.00	0.00
Sausage casings	0.00	0.00	0.00	-	-	Cotton cloths-Not bleached	0.29	0.33	0.04	1.00	0.00
Butter	0.37	0.43	0.07	0.00	1.00	Cotton cloths-Bleached	0.32	0.38	0.06	1.00	0.00
Cheese	0.28	0.36	0.07	0.79	0.21	Cotton cloths-Colored	0.32	0.31	-0.01	1.00	0.00
Herring	0.17	0.13	-0.04	0.00	1.00	Jute and jute butts, unman	0.00	0.00	0.00	-	-
Mackerel	0.14	0.16	0.02	0.00	1.00	Burlaps	0.10	0.12	0.02	0.00	1.00
2. Animals and Animal Products, Inedible						Manila fiber	0.00	0.00	0.00	-	-
Cattle hides	0.00	0.10	0.10	1.00	0.00	Sisal fiber	0.00	0.00	0.00	-	-
Calf and Kip Skins	0.00	0.10	0.10	1.00	0.00	Matting and mats for floors	0.46	0.66	0.20	0.00	1.00
Sheep and lamb skins	0.00	0.00	0.00	-	-	Carpet wool, unman	0.09	0.07	-0.02	1.00	0.00
Goat and kid skins	0.00	0.00	0.00	-	-	Clothing wool, unman	0.59	0.86	0.28	1.00	0.00
Gloves	0.50	0.55	0.05	1.00	0.00	Combing wool, unman	0.61	0.76	0.15	0.00	1.00
Beaver, fur	0.00	0.00	0.00	-	-	Wool yarns	0.49	0.57	0.09	0.74	0.26
Fox, fur	0.00	0.00	0.00	-	-	Raw silk	0.00	0.00	0.00	-	-
Marten, fur	0.00	0.00	0.00	-	-	Spun silk	0.45	0.46	0.02	1.00	0.00
Squirrel, , fur	0.00	0.00	0.00	-	-	6. Wood and Paper					
Bristles, sorted, etc.	0.05	0.03	-0.03	0.00	1.00	Wood: Boards, etc., softwood	0.00	0.03	0.03	0.00	1.00
3. Vegetable Food Products and Beverages						Pulp wood	0.00	0.00	0.00	-	-
Corn	0.19	0.40	0.21	0.00	1.00	Wood pulp-Mech ground	0.00	0.00	0.00	-	-
Rice, Cleaned	0.51	0.73	0.22	0.00	1.00	Wood pulp-Sulphite, unbl.	0.00	0.00	0.00	-	-
Wheat	0.00	0.00	0.00	0.00	1.00	Wood pulp-Sulphite, bl.	0.00	0.00	0.00	-	-
Beans, dried	0.36	0.66	0.30	0.00	1.00	Wood pulp-Sulphate, unbl.	0.00	0.00	0.00	-	-
Potatoes, white	0.25	0.58	0.34	0.00	1.00	Paper: Standard newsprint	0.00	0.00	0.00	-	-
Onions	0.78	1.62	0.83	0.00	1.00	7. Nonmetallic Minerals					
Bananas	0.00	0.00	0.00	-	-	Coal: Bituminous	0.09	0.08	-0.01	1.00	0.00
Olives	0.51	0.55	0.05	0.00	1.00	Petroleum: Crude	0.00	0.00	0.00	-	-
Currants	0.30	0.35	0.05	0.00	1.00	8. Metals and Manufacturers, Except Machinery and Vehicles					
Dates	0.26	0.26	-0.01	0.00	1.00	Iron ore	0.00	0.00	0.00	-	-
Almonds, shelled	0.48	0.65	0.17	0.00	1.00	Pig iron	0.08	0.09	0.02	0.00	1.00
Walnuts, shelled	0.50	0.70	0.20	0.00	1.00	Bar steel	0.26	0.29	0.02	0.13	0.87
Olive oil, edible	0.55	0.68	0.13	0.00	1.00	Aluminum: Crude, scrap, etc.	0.28	0.21	-0.07	0.00	1.00
Cocoa or cacao beans	0.00	0.00	0.00	-	-	Copper: Unrefined	0.00	0.00	0.00	-	-
Coffee	0.00	0.00	0.00	-	-	Copper: Refined	0.00	0.00	0.00	-	-
Tea	0.00	0.00	0.00	-	-	Tin: Bars, blocks, etc.	0.00	0.00	0.00	-	-
Sugar	0.67	1.00	0.33	1.00	0.00	9. Chemicals and Related Products					
4. Vegetable Products Inedible, Except Fibers and Wood						Fertilizers: Nitrate of soda	0.00	0.00	0.00	-	-
Rubber, crude	0.00	0.00	0.00	-	-						
Shellac	0.00	0.00	0.00	-	-						
Flaxseed or linseed	0.26	0.36	0.10	0.00	1.00						
Coconut Oil	0.00	0.00	0.00	0.00	1.00						
Palm Oil	0.00	0.00	0.00	-	-						
Peanut Oil	0.42	0.48	0.06	0.00	1.00						
Clover seed	0.30	0.41	0.11	0.00	1.00						
Tobacco, leaf wrapper	1.25	1.55	0.29	0.00	1.00						

Notes: τ_t is the ad valorem equivalent tariff rate in period t. $\Delta\tau$ is the change in the tariff rate between 1930H2 and 1930H1. % AV is the share of ad valorem tariffs and % S is the share of specific tariffs. See the text for data source.

Table A.2: Summary Statistics of Goods in Sample

Group		All Sample Free	Dutiable	Duty	Total	Tariff	Tariff Dutiable	Our Sample All	All
Total Value	1939H1	$1,102,107,285	$603,891,126	$269,357,255	$1,705,998,411	15.79%	44.60%	$1,023,169,216	59.97%
of Imported Merchandise	1930H2	$979,015,749	$429,063,131	$192,528,261	$1,408,078,880	13.67%	44.87%	$782,473,632	55.57%
Entered for Consumption	Change (%)	-11.17%	-28.95%	-28.52%	-17.46%	-13.40%	0.60%	-23.52%	-7.34%
00.-Animals	1939H1	$12,693,826	$46,483,268	$11,096,913	$59,177,094	18.75%	23.87%	$23,450,055	39.63%
and Animal Products, Edible	1930H2	$10,172,891	$29,970,648	$8,209,781	$40,143,539	20.45%	27.39%	$16,132,891	40.19%
	Change (%)	-19.86%	-35.52%	-26.02%	-32.16%	9.06%	14.74%	-31.20%	1.42%
0.-Animals and	1939H1	$123,267,533	$25,833,782	$7,573,539	$149,101,315	5.08%	29.32%	$78,184,447	52.44%
Animal Products, Inedible	1930H2	$59,040,992	$42,822,022	$11,219,665	$101,863,014	11.01%	26.20%	$52,433,606	51.47%
	Change (%)	-52.10%	65.76%	48.14%	-31.68%	116.84%	-10.63%	-32.94%	-1.84%
1.-Vegetable Food	1939H1	$206,434,619	$146,688,403	$91,182,314	$353,123,022	25.82%	62.16%	$295,076,635	83.56%
Products and Beverages	1930H2	$183,292,046	$78,819,446	$62,913,320	$262,111,492	24.00%	79.82%	$212,547,850	81.09%
	Change (%)	-11.21%	-46.27%	-31.00%	-25.77%	-7.05%	28.41%	-27.97%	-2.96%
2.-Vegetable Products Ined-	1939H1	$143,102,274	$71,677,318	$35,174,276	$214,779,592	16.38%	49.07%	$128,595,356	59.87%
ible, Except Fibers and Wood	1930H2	$131,121,958	$44,569,126	$19,335,171	$175,691,084	11.01%	43.38%	$71,907,039	40.93%
	Change (%)	-8.37%	-37.82%	-45.03%	-18.20%	-32.80%	-11.60%	-44.08%	-31.64%
3.-Textile	1939H1	$182,684,508	$169,666,261	$71,073,296	$352,350,769	20.17%	41.89%	$233,983,604	66.41%
	1930H2	$166,706,266	$96,681,866	$43,872,243	$263,388,132	16.66%	45.38%	$188,446,131	71.55%
	Change (%)	-8.75%	-43.02%	-38.27%	-25.25%	-17.42%	8.33%	-19.46%	7.74%
4.-Wood and Paper	1939H1	$140,516,965	$15,890,705	$4,974,289	$156,407,670	3.18%	31.30%	$122,015,545	78.01%
	1930H2	$144,028,630	$19,797,608	$5,429,475	$163,826,238	3.31%	27.42%	$132,655,488	80.97%
	Change (%)	2.50%	24.59%	9.15%	4.74%	4.21%	-12.39%	8.72%	3.80%
5.-Nonmetallic Minerals	1939H1	$80,222,332	$29,551,722	$11,449,138	$109,774,054	10.43%	38.74%	$30,877,802	28.13%
	1930H2	$94,337,221	$41,517,937	$11,980,826	$135,855,158	8.82%	28.86%	$35,129,069	25.86%
	Change (%)	17.59%	40.49%	4.64%	23.76%	-15.45%	-25.52%	13.77%	-8.07%
6.-Metals	1939H1	$115,331,064	$40,117,498	$15,031,793	$155,448,562	9.67%	37.47%	$95,485,925	61.43%
and Manufacturers, Except	1930H2	$79,618,393	$29,914,908	$11,487,719	$109,533,301	10.49%	38.40%	$67,276,893	61.42%
Machinery and Vehicles	Change (%)	-30.97%	-25.43%	-23.58%	-29.54%	8.46%	2.49%	-29.54%	-0.01%
7.-Machinery and Vehicles	1939H1	$7,177,357	$11,723,936	$3,860,156	$18,901,293	20.42%	32.93%	$0.00	0.00%
	1930H2	$1,660,379	$9,681,580	$2,953,828	$11,341,959	26.04%	30.51%	$0.00	0.00%
	Change (%)	-76.87%	-17.42%	-23.48%	-39.99%	27.52%	-7.34%		
8.-Chemicals	1939H1	$45,434,698	$17,417,565	$6,032,466	$62,852,263	9.60%	34.63%	$15,499,857	24.66%
and Related Products	1930H2	$35,326,383	$13,868,894	$5,563,591	$49,195,277	11.31%	40.12%	$5,944,665	12.08%
	Change (%)	-22.25%	-20.37%	-7.77%	-21.73%	17.83%	15.83%	-61.65%	-51.00%
9. Miscellaneous	1939H1	$45,242,109	$28,840,668	$11,909,076	$74,082,777	16.08%	41.29%	$0.00	0.00%
	1930H2	$73,710,590	$21,419,096	$9,562,643	$95,129,686	10.05%	44.65%	$0.00	0.00%
	Change (%)	62.92%	-25.73%	-19.70%	28.41%	-37.47%	8.12%		

Notes: The table shows details of imports. Free represents the value of imports in a given product group that did not pay tariffs. Dutiable shows the value of imports subject to tariffs. Duty is the total nominal dollar amount paid in tariffs. Total is the total imports (Free plus Dutiable). Tariff is the ad valorem equivalent tariff rate and Tariff Dutiable is the ad valorem equivalent when only considering imports that are subjected to tariffs. All Sample are all goods and Our sample are the goods included in the sample used in this paper.

Table A.3: Correspondence Price Data with Tariff Data, 1930H1 (1/4)

Price Data Categories	**Tariff Data Category**	**Tariff Data Sub Category**	**Unit**
Beef and veal, fresh	Beef And Veal, Fresh	Beef, Fresh	pound
		Veal, Fresh	pound
Sausage casings	Sausage Casings	Sheep, lamb, and goat casings	pound
		Weasands and ox gullets	pound
		Sausagecasings, n. s. p. f	pound
Butter	Butter	Butter	pound
Cheese	Cheese	Cheese (except swiss) 5c lb	pound
		Cheese (except swiss) 25pc	pound
		Swiss Cheese	pound
Cod	Cod, Cured Or Preserved	Cod (dried)	pound
Herring	Herring, Cured Or Preserved	Pickled or salted, in bulk or containers weighing, with contents, over 15 pounds	pound
	Herring, Cured Or Preserved	Dried	pound
Mackerel, cured or preserved	Mackerel	Pickled or salted, in bulk or containers weighing, with contents, over 15 pounds	pound
Cattle hides	Cattle Hides	Dry or dry salted (over 12 pounds)	pound
		Wet salted (over 25pounds)	pound
Kip Skins	Calf And Kip Skins	Dry and salted (6-12 pounds)	pound
		Wet salted (12-25 pounds)	pound
Calf Skins	Calf And Kip Skins	Dry and salted (less than 6 pounds)	pound
		Wet salted (less than 12 pounds)	pound
Sheep and lamb skins	Sheep And Lamb Skins	Wooled	pound
		Slats, dry , no wool	pound
		Pickled skins , not split , no woo	pound
		Pickled fleshers, split,flesh side	pound
		Pickled skivers ,split ,grain side	pound
Goat and kid skins	Goat And Kid Skins	Dry and dry salted	pound
		Green or pickled	pound
Calf and kip, upper	Leather: Calf And Kip, Upper	Upper Leather, Calf and Kip	sq. ft.
Gloves	Leather Gloves		pair
Beaver	Beaver	Furs ,undressed Beaver	number
Fox, except silver or black	Fox, Except Silver Or Black	Furs ,undressed Fox other (than silver or black)	number
Marten	Marten	Furs ,undressed Marten	number
Squirrel	Squirrel	Furs ,undressed Squirrel	number
Bristles, sorted, etc.	Bristles Sorted ,Bunched ,Or Prepared	Bristles, Sorted, etc.	pound
Corn	Corn	Corn	bushel
Rice, Cleaned or milled	Rice, Cleaned	Cleaned or milled rice	pound
Wheat	Wheat	For grinding in bond and export	bushel
		Other	bushel

Correspondence Price Data with Tariff Data, 1930H1, cont. (2/4)

Price Data Categories	Tariff Data Category	Tariff Data Sub Category	Unit
Beans, dried	Beans, Dried	Beans ,dried	pound
Potatoes, white or Irish	Potatoes, White	Potatoes ,white or Irish	pound
Onions	Onions	Onions	pound
Bananas	Bananas	Bananas	bunch
Olives	Olives	Green	gallon
		Ripe	gallon
Currants , Zante or other	Currants	Currants , Zante or other	pound
Dates	Dates	Fresh or dried	pound
		Prepared or preserved	
Figs	Figs	Fresh , dried , or in brine	pound
		Prepared or preserved	pound
Raisins	Raisins		pound
Almonds, shelled	Almonds, Shelled	Shelled	pound
Almonds, not shelled	Almonds, Not Shelled	Not shelled	pound
Walnuts, shelled	Walnuts, Shelled	Shelled	pound
Walnuts, not shelled	Walnuts, Not Shelled	Not shelled.	pound
Olive oil, edible	Olive Oil, Edible	In packages weighing less than 40 pounds	pound
		Other	pound
Cocoa or cacao beans	Cocoa Or Cacao Beans	Cocoa or cacao beans	pound
Coffee	Coffee	Raw or green	pound
		Toasted	pound
Tea	Tea		pound
Sugar	Sugar	Sugarcane, natural	ton
		Beet sugar-Testing by the polariscope not above 75	pound
		Beet sugar-Testing by the polariscope not above 100	pound
		Cane Sugar Free	pound
		Cane Sugar Dutiable	pound
Rubber, crude	Rubber, Crude	Rubber , crude	pound
Shellac	Shellac		pound
Flaxseed	Flaxseed Or Linseed	Flaxseed	bushel
Coconut Oil	Coconut Oil	Coconut oil	pound
Palm Oil	Palm Oil	Palm oil	pound
Peanut Oil	Peanut Oil	Peanut Oil	pound
Soybean oil	Soybean Oil	Soybean oil	pound

Correspondence Price Data with Tariff Data, 1930H1, cont. (3/4)

Price Data Categories	Tariff Data Category	Tariff Data Sub Category	Unit
Clover seed	Clover Seed	Red	pound
		Alsike	pound
		Crimson	pound
		White	pound
		Clover seed, n. s. p. f	pound
Tobacco, leaf wrapper	Tobacco, Leaf Wrapper	Leaf for cigar wrappers -Unstemmed	pound
Unmanufactured Cotton	Unmanufactured Cotton	Long staple (118inches or over)	pound
		Short staple (under 136inches.	pound
Cotton cloths-Not bleached	Cotton Clothsâ€"Not Bleached	Not bleached, printed , dyed, colored, or woven figured	pound
Cotton cloths-Bleached	Cotton Cloths-Bleached	Bleached	pound
Cotton cloths-Colored	Cotton Cloths-Colored	Printed , dyed, colored, or woven figured	pound
Jute and jute butts, not dressed or manufactured-	Jute And Jute Butts	Jute	ton
		Jute Butts	ton
Burlaps	Burlaps	Burlaps and other woven fabrics wholly of jute, n.s.p.f	pound
Hemp, unmanufactured	Hemp, Unmanufactured	Hemp,unmanufactured	Ton
Manila fiber	Manila Fiber	Manila and abaca	Ton
Sisal fiber	Sisal Fiber	Sisal and henequen	Ton
Floor Coverings	Matting And Mats For Floors	Floor coverings, mats of coco fiber or ratan	sq. yd.
		Common China, Japan, and India straw mating and floor	sq. yd.
		Mating of coco fiber or ratan	sq. yd.
Unmanufactured-Carpet wool	Unmanufactured-Carpet Wool	Carpet wools not improved... , and hair of the camel-actual weight (All)	Pound
Unmanufacturedâ€"Clothing wool	Unmanufacturedâ€"Clothing Wool	Clothing wool In the grease	Pound
		Clothing wool On the skin	Pound
		Clothing wool Washed	Pound
		Clothing wool Scoured	Pound
Unmanufactured-Combing wool	Unmanufactured-Combing Wool	Combing wool. In the grease	Pound
		Combing wool. On the skin	Pound
		Combing wool. Washed	Pound
		Combing wool. Scoured	Pound
Unmanufactured-Hair, Angora, cashmere, etc.	Unmanufacturedâ€"Hair, Angora, Cashmere, Etc.	Hair of the Angora goat mohair, in the grease	Pound
		Hair of the Cashmere goat ,Alpaca ,and other like animals, in the grease	Pound
		Hair of the Cashmere goat ,Alpaca ,and other like animals, washed	Pound
		Hair of the Cashmere goat ,Alpaca ,and other like animals, scoured	Pound
Wool yarns	Wool Yarns	Yarns ,of wool, mohair, Valued over $1 per pound	Pound
		Wool and other hair Valued over 30c,not over $1 per pound 1per pound	Pound
		Wool and other hair Valued over $1 per pound 1per pound	Pound
Raw silk	Raw Silk	Raw silk , in skeins, reeled from the coco	Pound
Spun silk	Spun Silk	Spun silk or shappe silk yarn, or yarn of s	Pound

Correspondence Price Data with Tariff Data, 1930H1, cont. (4/4)

Price Data Categories	Tariff Data Category	Tariff Data Sub Category	Unit
Wood: Boards, etc., softwood	Wood: Boards, Etc., Softwood	Boards , planks , and deals	M Ft
Pulp wood	Pulp Woods	Pulpwood rough spruce	Cord
		Pulpwood rough poplar	Cord
		Pulpwood rough other	Cord
		Pulpwood peeled spruce	Cord
		Pulpwood peeled poplar	Cord
		Pulpwood peeled other	Cord
		Pulpwood rossed spruce	Cord
Wood pulp-Mechanically ground	Wood Pulp-Mechanically Ground	Mechanically ground wood pulp unbleached	Ton
		Mechanically ground wood pulp bleached	Ton
Wood pulp-Sulphite, unbleached	Wood Pulp-Sulphite, Unbleached	Chemical wood pulp, Sulphite ,unbleached including (easy bleaching ,newsgrade	Ton
Wood pulp-Sulphite, bleached	Wood Pulp-Sulphite, Bleached	Chemical wood pulp, Sulphite ,bleached	Ton
Wood pulp-Sulphate, unbleached	Wood Pulp-Sulphate, Unbleached	Chemical wood pulp, Sulphate ,unbleached kraft (pulp).	Ton
Printing Paper	Paper: Standard Newsprint	Newsprint paper,80 percent mechanical ground and 20 percent bleached sulphate	Pound
Coal: Bituminous	Coal: Bituminous	Bituminous coal ,shale ,and lignite	Ton
		Bituminous coal and shale , imported from countries imposing duty	Ton
Petroleum: Crude	Petroleum: Crude	Crude petroleum	Bbl
Iron ore	Iron Ore	Iron ore , including manganiferous iron ore , n. e. s ..	Ton
Pig iron	Pig Iron	Pig iron	Ton
Bar steel	Bar Steel	Steel Bar Valued (various values and content)	Pound
Aluminum		Aluminum , crude scrap and alloy	Pound
Copper: Unrefined	Copper: Unrefined	Copper , unrefined black , blister , and converter, inpigs, or con	Pound
Copper: Refined	Copper: Refined	refined, in ingots, plates, or bars	Pound
Tin: Bars, blocks, etc.	Tin: Bars, Blocks, Etc.	Tin bars , blocks , pigs, grain, granulated, or scrap, and alloy	Pound
Fertilizers: Nitrate of soda	Fertilizers: Nitrate Of Soda	Sodium nitrate nitrate (of soda)	Ton

Table A.4: Correspondence Price Data with Tariff Data, 1930H2 (1/4)

Price Data Categories	**Tariff Data Category**	**Tariff Data Sub Category**	**Unit**
Beef and veal, fresh	Beef and veal, fresh	Beef, Fresh	pound
		Veal, Fresh	pound
Sausage casings	Sausage casings	Sheep, lamb, and goat casings	pound
		Weasands and ox gullets	pound
		Sausagecasings, n. s. p. f	pound
Butter	Butter	Butter	pound
Cheese	Cheese	Emmenthaler or Swiss with eye formation	pound
		Romano or Pecorino	pound
		Reggiano or Parmesan	pound
		Provoloni or Provolette	pound
		Roquefort	pound
		Other	pound
Cod	Cod, cured or preserved	Cod (dried)	pound
Herring	Herring, cured or preserved	Pickled or salted	pound
Mackerel	Mackerel, cured or preserved	Pickled or salted	pound
Cattle hides	Cattle hides	Dry or dry salted (over 12 pounds)	pound
		Wet salted (over 25pounds)	pound
Kip Skins	Calf and kip skins	Dry and salted (6-12 pounds)	pound
		Wet salted (12-25 pounds)	pound
Calf Skins	Calf and kip skins	Dry and salted (less than 6 pounds)	pound
		Wet salted (lessthan 12 pounds)	pound
Sheep and lamb skins	Sheep and lamb skins	Wooled (wool on dry and green salted)	pound
		Slats, dry , no wool	pound
		Pickled skins , not split , no woo	pound
		Pickled fleshers, split,flesh side	pound
		Pickled skivers ,split ,grain side	pound
Goat and kid skins	Goat and kid skins	Dry and dry salted	pound
		Green or pickled	pound
Calf and kip, upper	Leather: calf and kip, upper	Upper Leather, Calf and Kip	sq. ft.
Gloves	Leather gloves		pair
Beaver	Beaver	Furs ,undressed Beaver	number
Fox, except silver or black	Fox, except silver or black	Furs ,undressed Fox other (than silver or black)	number
Marten	Marten	Furs ,undressed Marten	number
Squirrel	Squirrel	Furs ,undressed Squirrel	number
Bristles, sorted, etc.	Bristles, sorted, etc.	Sorted ,bunched ,or prepared	pound
Corn	Corn	Corn	Bushel
Rice, cleaned	Rice, cleaned	Cleaned or milled rice	Pound
Wheat	Wheat	For grinding in bond and export	Bushel
		Other	Bushel

Correspondence Price Data with Tariff Data, 1930H2, cont. (2/4)

Price Data Categories	Tariff Data Category	Tariff Data Sub Category	Unit
Beans, dried	Beans, dried	Beans ,dried .	Pound
Potatoes, white	Potatoes, white	Certified seed	Pound
		Other	Pound
Onions	Onions	Onions	Pound
Bananas	Bananas	Bananas	Bunch
Olives	Olives	Green	Gallon
		Ripe	Gallon
Currants	Currants	Currants , Zante or other	pound
Dates	Dates	Fresh or dried with pit	pound
		Fresh or dried with pits removed	pound
		In packages of not more than 10pounds	pound
		Prepared or preserved	pound
Figs	Figs	Fresh , dried , or in brine	Pound
		Fig paste	Pound
		Prepared or preserved	Pound
Raisins	Raisins		Pound
Almonds, shelled	Almonds, shelled	Shelled	Pound
Almonds, not shelled	Almonds, not shelled	Not shelled	Pound
Walnuts, shelled	Walnuts, shelled	Shelled	Pound
Walnuts, not shelled	Walnuts, not shelled	Not shelled.	Pound
Olive oil, edible	Olive oil, edible	In packages weighing less than 40pounds	Pound
		Other	Pound
Cocoa or cacao beans	Cocoa or cacao beans	Cocoa or cacao beans	Pound
Coffee	Coffee	Raw or green	Pound
		Roasted	Pound
Tea	Tea	Tea, n.s.p.f	Pound
Sugar	Sugar	Sugarcane, natural	Pound
		Beet sugar-Testing by the polariscope not above 75	Pound
		Beet sugar-Testing by the polariscope not above 100	Pound
		Cane Sugar Free	Pound
		Cane Sugar Dutiable	Pound
Rubber, crude	Rubber, crude	Rubber , crude	Pound
Shellac	Shellac		Pound
Flaxseed or linseed	Flaxseed or linseed	Flaxseed	Bushel
Coconut	Coconut	Coconut oil.	Pound
Palm	Palm oil	Palm oil	Pound
Peanut	Peanut oil	Peanut oil	Pound
Soya bean	Soybean oil	Soybean oil	Pound
		Soybean oil	Pound

Correspondence Price Data with Tariff Data, 1930H2, cont. (3/4)

Price Data Categories	Tariff Data Category	Tariff Data Sub Category	Unit
Clover seed	Clover seed	Red	Pound
		sweet	Pound
		Crimson	Pound
		White	Pound
		Clover seed, n. s. p. f	Pound
Tobacco, leaf wrapper	Tobacco, leaf wrapper	Leaf for cigar wrappers -Unstemmed	Pound
Unmanufactured Cotton	Unmanufactured cotton	All sub categories	Pound
Cotton cloths-Not bleached	Cotton cloths-not bleached	Not bleached, printed , dyed, colored, or woven figured	sq. yd.
Cotton cloths-Bleached	Cotton cloths-bleached	Bleached	sq. yd.
Cotton cloths-Colored	Cotton cloths-colored	Printed , dyed, colored, or woven figured	sq. yd.
Jute and jute butts, not dressed or man	Jute and jute butts	Jute	Ton
		Jute Butts	Ton
Burlaps	Burlaps	Burlaps and other woven fabrics wholly of jute, n.s.p.f	Pound
Hemp, unmanufactured	Hemp, unmanufactured	Hemp,unmanufactured	Ton
Manila fiber	Manila fiber	Manila and abaca	Ton
Sisal fiber	Sisal fiber	Henequin and sisal	Ton
Matting and mats for floors	Matting and mats for floors	Floor coverings, mats of coco fiber or ratan	sq. yd.
		Common China, Japan, and India straw mating and floor	sq. yd.
		Mating of coco fiber or ratan	sq. yd.
Unmanufactured-Carpet wool	Unmanufactured-carpet wool	Carpet wool, clean content	Pound
Unmanufactured-Clothing wool	Unmanufactured-clothing wool	Clothing wool, clean weight	Pound
Unmanufactured-Combing wool	Unmanufactured-combing wool	In the grease, on the skin or washed	Pound
		Sorted,or matchings	Pound
Unman-Hair, Angora, cashmere, etc.	Unman-hair, angora, cashmere, etc.	Hair of the Angora goat mohair, in the grease	Pound
		Hair of the Cashmere goat ,Alpaca ,and other like animals, in the grease	Pound
		Hair of the Cashmere goat ,Alpaca ,and other like animals, washed	Pound
		Hair of the Cashmere goat ,Alpaca ,and other like animals, scoured	Pound
Wool yarns	Wool yarns	Yarns ,of wool, mohair	Pound
		Rabbit	Pound
		Wool and other hair	Pound
Raw silk	Raw silk	Raw silk , in skeins, reeled from the coco	Pound
Spun silk	Spun silk	Spun silk and yarn ,or yarn of silk and rayon or other synthetic textile and roving, all	Pound

Correspondence Price Data with Tariff Data, 1930H2, cont. (4/4)

Price Data Categories	Tariff Data Category	Tariff Data Sub Category	Unit
Wood: Boards, etc., softwood	Wood: boards, etc., softwood	Softwood Fir	Mft.
		Softwood Hemlock	Mft.
		Softwood Spruce	Mft.
		Softwood Pine	Mft.
		Boards ,planks ,and deals inthe rough orplaned and dresse Fir	Mft.
		Boards ,planks ,and deals inthe rough orplaned and dresse Hemlock	Mft.
		Boards ,planks ,and deals inthe rough orplaned and dresse Spruce	Mft.
		Boards ,planks ,and deals inthe rough orplaned and dresse Pine	Mft.
		Boards ,planks ,and deals inthe rough orplaned and dresse Larch	Mft.
		Other softwood	Mft.
Pulp woods	Pulp woods	Pulpwood rough spruce	Cord
		Pulpwood rough other	Cord
		Pulpwood peeled spruce	Cord
		Pulpwood peeled poplar	Cord
		Pulpwood peeled other	Cord
		Pulpwood rossed spruce	Cord
		Pulpwood rossed other	Cord
Wood pulp-Mechanically ground	Wood pulp-mechanically ground	Mechanically ground wood pulp unbleached	Ton
		Mechanically ground wood pulp bleached	Ton
Wood pulp-Sulphite, unbleached	Wood pulp-sulphite, unbleached	Chemical wood pulp, Sulphite ,unbleached	Ton
Wood pulp-Sulphite, bleached	Wood pulp-sulphite, bleached	Chemical wood pulp, Sulphite ,bleached	Ton
Wood pulp-Sulphate, unbleached	Wood pulp-sulphate, unbleached	Chemical wood pulp, Sulphate ,unbleached kraft (pulp).	Ton
		Chemical wood pulp, Sulphate,unbleached and bleached	Ton
Paper: Standard newsprint	Paper: standard newsprint	Printing paper Standard newsprint paper	Pound
Coal: Bituminous	Coal: bituminous	Bituminous coal ,shale ,and lignite	Ton
		Bituminous coal and shale , imported from countries imposing duty	Ton
		Total	
Petroleum: Crude	Petroleum: crude	Crude petroleum	Bbl
Iron ore	Iron ore	Iron ore , including manganiferous iron ore , n. e. s ..	Ton
Pig iron	Pig iron	Not containing dutiable alloy	Ton
		Containing dutiable alloy (grossweight)	Ton
		Vanadium content in excess of Ho per cent	Pound
Bar steel	Bar steel	Concrete reinforcement bars (various values)	Pound
		Hollow bars ,and hollow drill steel (various values)	Pound
		Steel bars , n. e.s. (various values)	Pound
Aluminum: Crude, scrap, etc.	Aluminum: crude, scrap, etc.	Metal , scrap and alloys, crude	Pound
Copper: Unrefined	Copper: unrefined	Unrefined black, blister, and converter, in pigs , or converter	Pound
Copper: Refined	Copper: refined	Refined, iningots, plates, or bars	Pound
Tin: Bars, blocks, etc.	Tin: bars, blocks, etc.	Tin bars , blocks , pigs, grain, granulated, or scrap, and alloy	Pound
Fertilizers: Nitrate of soda	Fertilizers: nitrate of soda	Sodium nitrate (nitrate of soda) -	Ton

Table A.5: Effects of Tariffs for 1930H2

	Quantity		Value		Unit Value		Price	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\Delta Tariff_i$	-4.247**	-5.306***	-4.525**	-5.567***	-0.279	-0.261	-0.311	-0.295
	(1.880)	(1.924)	(1.878)	(1.931)	(0.242)	(0.260)	(0.188)	(0.214)
Constant	-0.187*	-0.133	-0.316***	-0.264**	-0.129***	-0.130***	-0.148***	-0.150***
	(0.102)	(0.107)	(0.105)	(0.106)	(0.024)	(0.023)	(0.023)	(0.022)
Sector FE	No	Yes	No	Yes	No	Yes	No	Yes
Source	Duty	Duty	Duty	Duty	Duty	Duty	Price	Price
Observations	73	72	73	72	73	72	73	72
R-squared	0.117	0.309	0.129	0.346	0.012	0.235	0.019	0.195

Notes: Unit value are import prices computed using the value of the article at the port (pre-tariff)/physical quantity imported. "Price" corresponds to foreign producers' wholesale prices as measured at the port of entry (as shown in Table D.9, but using a similar time span to make it comparable to columns (5) and (6)). Standard errors are clustered at the product level and shown in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Table A.6: Effects of Tariffs for 1931

	Quantity		Value		Unit Value		Price	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\Delta Tariffs_i$	–4.141***	-5.322***	-3.994***	-5.248***	0.147	0.074	0.403	0.456
	(1.030)	(1.117)	(1.031)	(1.171)	(0.303)	(0.383)	(0.451)	(0.501)
Constant	0.510***	0.561***	0.193**	0.244***	-0.316***	-0.318***	-0.351***	-0.358***
	(0.077)	(0.079)	(0.076)	(0.076)	(0.033)	(0.032)	(0.031)	(0.029)
Sector FE	No	Yes	No	Yes	No	Yes	No	Yes
Source	Duty	Duty	Duty	Duty	Duty	Duty	Price	Price
Observations	73	72	73	72	73	72	73	72
R-squared	0.188	0.311	0.181	0.377	0.002	0.204	0.016	0.203

Notes: Unit value are import prices computed using the value of the article at the port (pre-tariff)/physical quantity imported. "Price" corresponds to foreign producers' wholesale prices as measured at the port of entry (as shown in Table D.9).Standard errors are clustered at the product level and shown in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

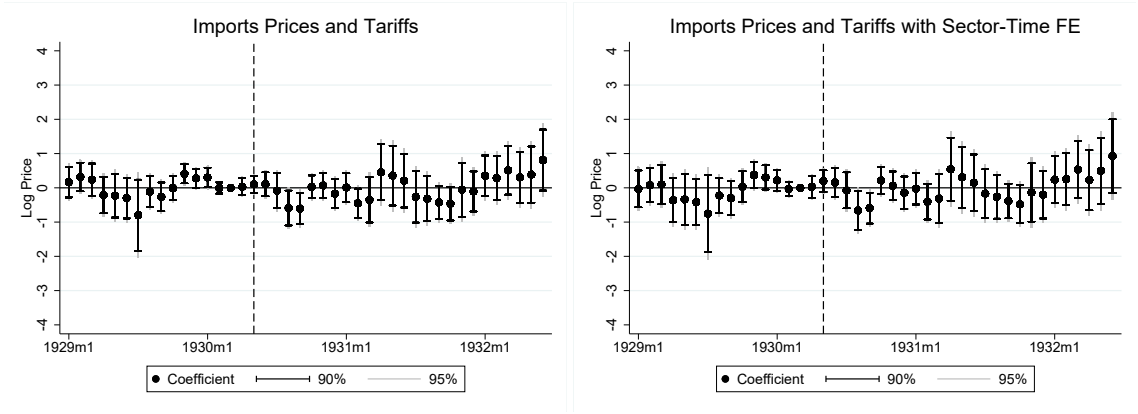
Table A.7: Instrumental Variables Estimates of the Effects of Tariffs on Quantities

	(1)	(2)	(3)	(4)
$\Delta Tariff_i$	-3.428***	-4.715***	-3.567***	-4.573***
	(0.910)	(0.867)	(1.078)	(1.167)
Time FE	Yes	Yes	Yes	Yes
Product FE	Yes	Yes	Yes	Yes
Sector-Time FE	No	Yes	No	Yes
Regression	OLS	OLS	IV	IV
F-Test			17.05	15.06
Observations	3,066	3,024	3,066	3,024
R-squared	0.931	0.943	0.024	0.042

Notes: The first two columns show OLS estimates of equation (4) using data between January 1929 to June 1932. Columns 3 and 4 show the IV estimates, where the instrumental variable is defined as the level of the ad valorem equivalent tariff in the first half of 1930, i.e., prior to the enactment of Smoot-Hawley. The sector fixed effect is at the 1-digit level as described in the text. Standard errors clustered at the product level in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

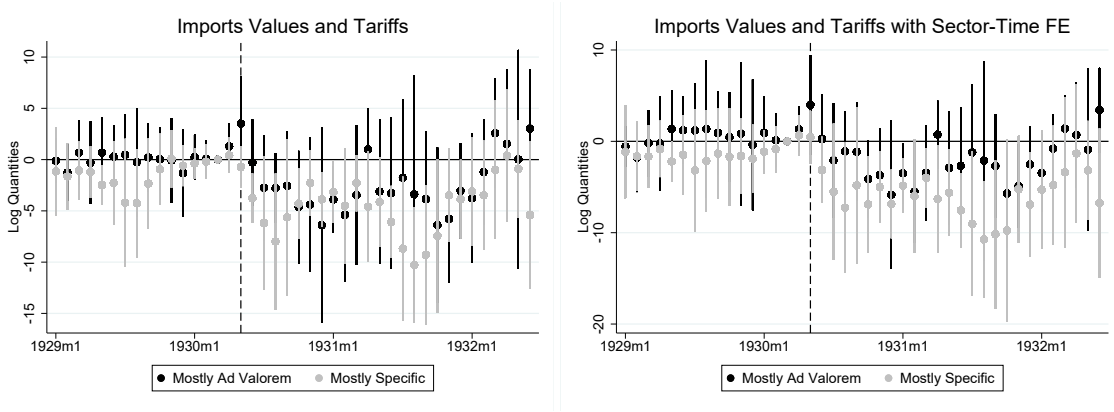
B Additional Figures

Figure B.1: Tariffs effect on Import Prices using Tariff Change to 1931



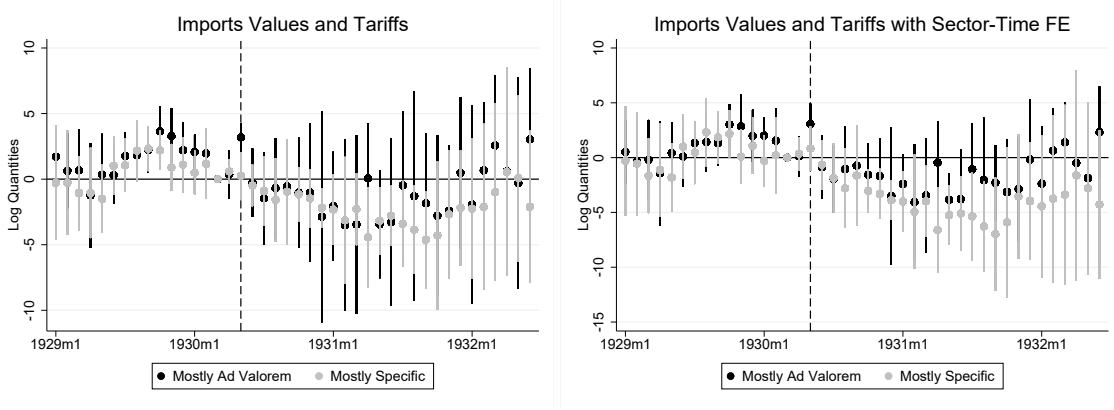
Notes: The figure shows estimates for equation (2), where the dependent variable is the log price. The change in tariffs is measure as the change between 1930H1 and 1931. The right panel also includes sector-time fixed effects. The baseline period is March 1930 for both figures. Black dots are coefficients for the change in tariffs as defined in equation (1) interacted with the time fixed-effect each period, the darker lines represent 90-percent confidence intervals and the light gray lines 95-percent confidence intervals. Standard errors are clustered at the product level.

Figure B.2: Tariffs Effect by Type of Tariff



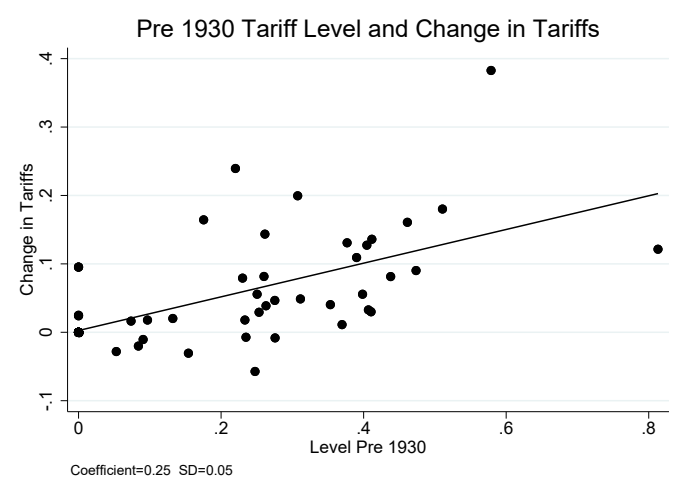
Notes: The figure shows estimates for equation (3), where the dependent variable is the log of the value of imports. The right panel also includes sector-time fixed effects. The baseline period is March 1930 for both graphs. Dots are coefficients for the change in tariffs as defined in equation (1) interacted with the time fixed-effect each period. Black dots are for the interaction with the share of ad valorem tariffs and gray are for the share of specific tariffs. Lines represent 95 percent confidence intervals. Standard errors are clustered at the product level.

Figure B.3: Effect by Type of Tariff without monthly cyclicality



Notes: The figure shows results for regression (3), where the dependent variable is the log values. The left panels do not include controls, and the right panels include sector-time fixed-effects. All variables are seasonally adjusted, by taking the residual of regression with month fixed effect at the product level. The baseline period is March 1930 for both graphs. Dots are coefficients for the change in tariffs as defined in equation (1) interacted with the time fixed-effect each period. Black dots are for the interaction with the share of ad valorem tariffs and gray are for the share of specific tariffs. Lines represent 95 percent confidence intervals. Standard errors are clustered at the product level.

Figure B.4: First Stage IV



Notes: The figure shows a scatter plot where in the x-axis we have the log of 1 plus the tariff rate pre Smoot-Hawley, and in the y-axis we have the change in tariff after the Tariff Act. The solid line shows the linear fit. The note shows the results of a regression where the dependent variable is the change in tariff and the independent variable is the pre Smoot-Hawley tariff. SD is the standard error of the main coefficient. We use Robust standard errors in that regression.

C Data Validation

To validate our imputation, we compare price data from the prices at the origin and unit values or prices calculated using the values of the import over the quantity imported for a given import. From the annual table of tariffs, we obtain quantities and values for the first semester of 1930, the second semester of 1930, and 1931. With that information, we can take average unit values at the good level by dividing each import's total value by its total quantity. We then take an equivalent average from our price data and compare both units. Figure C.5 shows the relationship between both measures of unit prices. We can see that there is a strong correlation between both measures. Table C.8 a regression where the dependent variable is the duty price and the independent variable is the monthly average, gives a coefficient of between 0.998 and 1.007, in all cases with constant is small, and we find a high R squares. This results indicates that our merge between prices and categories of imports is likely accurate.

Figure C.5: Measures of Prices

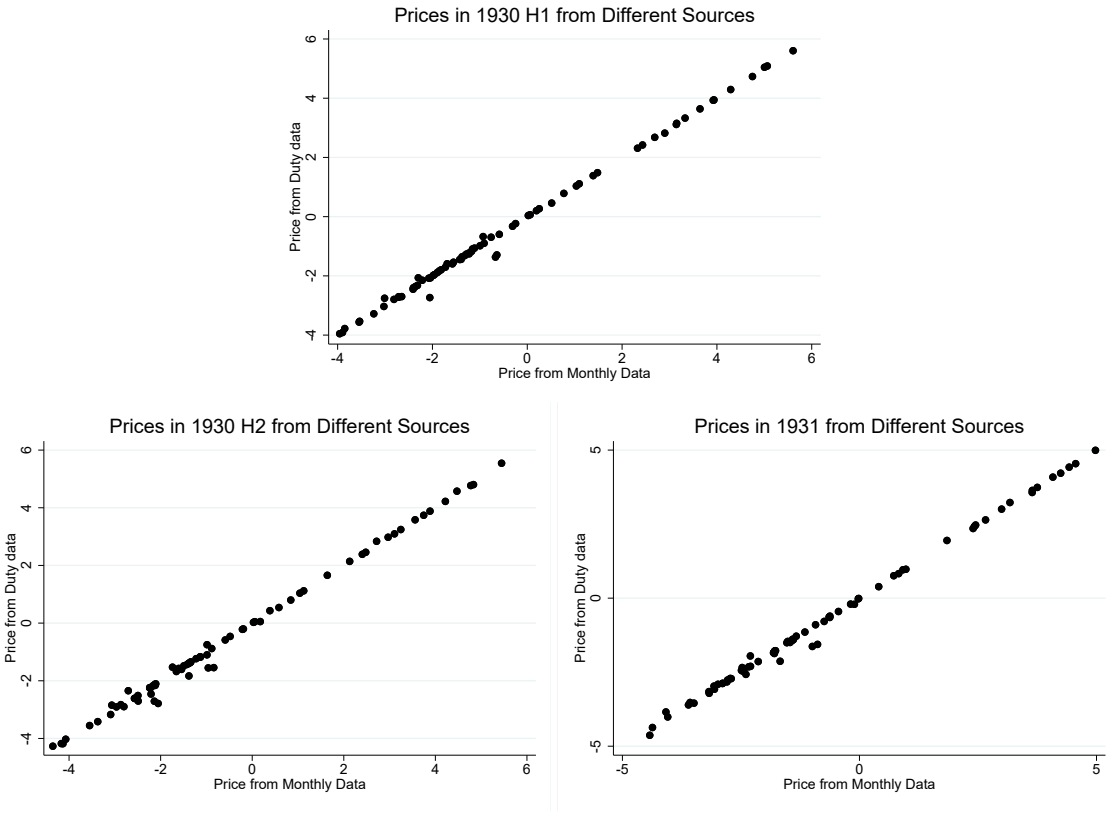


Table C.8: Comparing Different Unit of Prices

	Duty Unit Value		
	(1)	(2)	(3)
Average Price	0.998***	1.007***	1.003***
	(0.004)	(0.005)	(0.005)
Constant	-0.014	-0.019*	-0.037*
	(0.016)	(0.036)	(0.020)
Period	1930H1	1930H2	1931
Observations	73	73	73
R-squared	0.996	0.995	0.993

D Average Effect of Tariffs on Prices

We can examine the average effect of tariffs over the entire treatment period. To do so, we estimate the following regression using our baseline definition of $\Delta Tariff_i$:

$$\log(Price_{it}) = \alpha_t + \gamma_i + \beta I(1\ if\ t \geq 1930m6)\Delta Tariff_i + \varepsilon_{i,t}. \tag{D.1}$$

To avoid the influence of the 1929 price variations shown in Figure 7, which tended to be negative, Table D.9 shows estimates with the sample period starting in December 1929.

Table D.9: 1930 Tariff's Effect on Import Prices

	(1)	(2)
$I(1\ if\ t \geq 1930m6)\Delta Tariffs_i$	0.257	0.273
	(0.316)	(0.373)
Product FE	Yes	Yes
Time FE	Yes	Yes
Sector-Time FE	No	Yes
Observations	2,190	2,160
R-squared	0.993	0.993

Notes: "Price" corresponds to foreign producers' wholesale prices as measured at the port of entry and are pre-tariff prices as discussed in the text. Standard errors are clustered at the product level and shown in parentheses.

E Model and Simulation

In this section, we develop a model to shed light on our empirical findings and to aid in the interpretation of the short-run dynamic effects of the tariff on prices and quantities in our setting in comparison to others. We begin with a model that imposes assumptions that are standard in open-economy, New Keynesian frameworks, and then simulate the effects of a change in the tariff rate under different monetary policy rules.

E.1 Model

We model three economies that are symmetric and trade with each other. In each economy, households consume both domestic and foreign-produced goods. Firms in each

country produce goods using only labor and set prices in local currency. Households purchase imports where the nominal exchange rate is used to convert prices to local currency values. There is no heterogeneity in households or firms within a country. One country in our model imposes a tariff on a good produced in another economies. In our setting, we assume that tariffs are imposed on a particular product produced in a single origin, which imply that bilateral exchange rates will matter.[22] Our model allows us to capture some characteristics of our data, namely, that not all destinations produced all products, so differences in bilateral exchange rate changes could play a role in determining the effect of the tariff on imports.

Specifically, in country i, the representative household maximizes utility subject to a constraint as follows:

$$\max_{C_{i,t}, L_{i,t}, B_{i,t}} U(C_{i,t}, L_{it})$$

s.t.

$$P_{i,t}C_{i,t} + B_{i,t} = W_{i,t}L_{i,t} + (1 + i_{i,t-1})B_{i,t-1},$$

where $C_{i,t}$ is the household's consumption bundle at time t, and $L_{i,t}$ the labor supply. $P_{i,t}$ is the price index and $W_{i,t}$ is the wage. We assume that workers only supply their labor for the production of domestic goods. $i_{i,t}$ the nominal interest rate and $B_{i,t}$ the risk-free, nominal bond issued by country i. For simplicity, each consumer only demands the domestic bond. An external agent trades countries' bonds in a competitive financial market, resulting in the standard uncovered interest parity condition.

We model the household's consumption with a standard, CES preferences such that:

$$C_{i,t} = \left(\phi_H^{\frac{1}{\sigma}} c_{ii,t}^{\frac{\sigma-1}{\sigma}} + \phi_F^{\frac{1}{\sigma}} c_{ji,t}^{\frac{\sigma-1}{\sigma}} + \phi_H^{\frac{1}{\sigma}} c_{ki,t}^{\frac{\sigma-1}{\sigma}} \right)^{\frac{\sigma}{\sigma-1}},$$

where $c_{ji,t}$ is the good produced in country j, consumed by the household in country i at time t. We assume $\phi_H + 2\phi_F = 1$, which are preference shifters and σ is the elasticity of substitution between goods produced in different countries. Given these preferences, the

[22] Alternatively, we could model foreign economies that produce many products and impose product-specific tariffs, in which case we could just assume a monetary union for the foreign economy. In this set up, the exchange rate dynamics will be the same for both products.

price index is:

$$P_{i,t} = \left(\phi_H p_{ii,t}^{1-\sigma} + \phi_F p_{ji,t}^{1-\sigma} + \phi_F p_{ki,t}^{1-\sigma}\right)^{\frac{1}{1-\sigma}},$$

where $p_{ji,t}$ is the price of the product produced in country j faced by consumer in country i.

There are three economies, economy H, A and B. Economy H imposes a tariff on economy A $\tau_{HA,t}$, which can vary at time t. Prices faced by households in economy H are thus:

$$p_{ij,t} = p_{i,t} e_{ji,t} (1 + \tau_{ij,t}),$$

where $e_{ji,t}$ is the nominal exchange rate between economy j and i (j currency over i) and $p_{i,t}$ is the price set by the producer of the good produced in economy i. We can then write the intertemporal condition for the local consumer as

$$\frac{c_{ijt}}{c_{iit}} = \left(\frac{p_{it}}{p_{jt} e_{ijt} (1 + \tau_{ijt})}\right)^{\sigma},$$

which is the same as Equation 5 shown in Section 4.

We then solve the rest of the model. We assume that the consumer chooses between consumption and labor such that:

$$U(C_{i,t}, L_{it}) = \frac{C_{i,t}^{1-\gamma}}{1-\gamma} - \frac{L_{i,t}^{1+\alpha}}{1+\alpha},$$

where γ is the inverse of the intertemporal elasticity of substitution and α is the inverse of the labor supply elasticity.

From the consumers' intertemporal problem, we obtain the following Euler equation:

$$\left(\frac{C_{i,t}}{C_{i,t+1}}\right)^{-\gamma} = \frac{P_{i,t}}{E_t P_{i,t+1}} (1 + i_t)$$

The firm produces with labor linearly and faces sticky prices. The firm's output prices are the same regardless of destination and are set in local currency, i.e., there is no spatial price discrimination, but prices in other countries are subject to the nominal exchange

rate and to any applicable tariffs. Using the log-linearized expression for the firm's problem, with $\check{x}_{i,t} = \frac{dx_{it}}{\bar{x}}$ and $\check{pi}_{i,t} = \check{p}_{i,t} - \check{p}_{i,t-1}$, yields the following Phillips curve for each economy:

$$\check{\pi}_{i,t} = \beta E_t \check{\pi}_{i,t+1} + \kappa \check{mc}_{i,t},$$

where $\check{mc}_{i,t}$ is the marginal cost and $\kappa = \frac{(1-\theta)(1-\theta\beta)}{1-\theta}$, with $1-\theta$ representing the frequency of price adjustment.

Given the presence of domestic-currency bonds trading without frictions in a financial market, we also have an uncovered, interest-rate parity condition, meaning that interest rates in the economies are:

$$\check{i}_{i,t} - \check{i}_{j,t} = \check{e}_{ij,t+1} - \check{e}_{ij,t}$$

Additionally, the risk-sharing conditions hold between the economies with

$$\gamma(\check{C}_{i,t} - \check{C}_{j,t}) = \check{P}_{j,t} + \check{e}_{ij,t} - \check{P}_{i,t}$$

.

We allow for monetary authorities to follow or impose different monetary policy rules or nominal anchors. For example, we allow them to fix their exchange rates, in which case $\check{e}_{ij,t} = 0$ for all partners j. Alternatively, we allow them to choose a different nominal anchor, such as $0 = \check{P}_{i,t} + \check{Y}_{i,t}$ or a Taylor rule $\check{i}_{i,t} = \phi_\pi \check{\pi}_{i,t}$.

E.2 Simulation

Using this set up, we now simulate a permanent shock to the tariff rate $(1 + \tau_{i,t})$. We use $\alpha = 2/3$, and $\gamma = 2$. We simulate monthly changes, with $\beta = 0.996$ and $\theta = 0.917$. We use as a baseline $\phi_H = 0.75$, which represents a relatively large share of imports and exports. In our simulation, we also use a version applicable to a small open economy in order to show effects where prices in the foreign economy do not move. These values only serve as a benchmark to show the extent of the influence of different prices in the estimated trade elasticity. Finally, we use a value of $\sigma = 4$ based on our empirical analysis. Using these values, we can decompose the impact of the tariff-rate change on the prices,

quantities, and the exchange rate of the domestic economy. We then compare these effects under alternative monetary policy rules, fixed exchange rates or floating exchange rates, that exist at the time the new tariff is imposed. Figure E.6 shows the exchange rate effects and Figure E.7 shows the decomposition, with fixed exchange rates plotted with the solid line and floating exchange rates with the dashed line.

Figure E.6: Effect of Tariffs in Relative Imports by Monetary Policy Regime

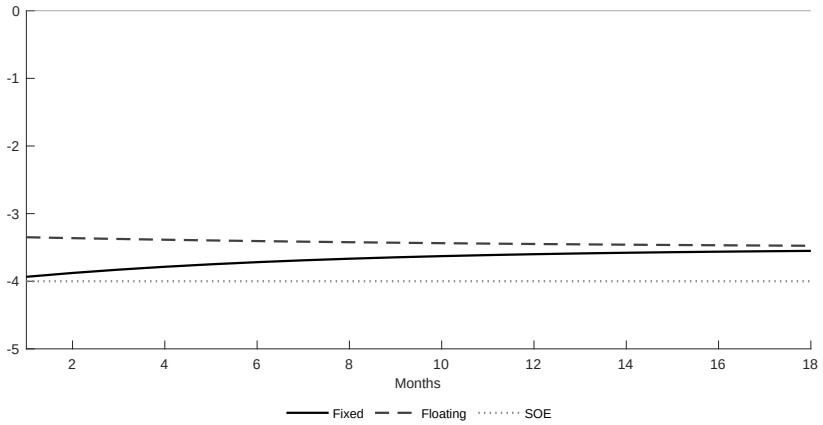
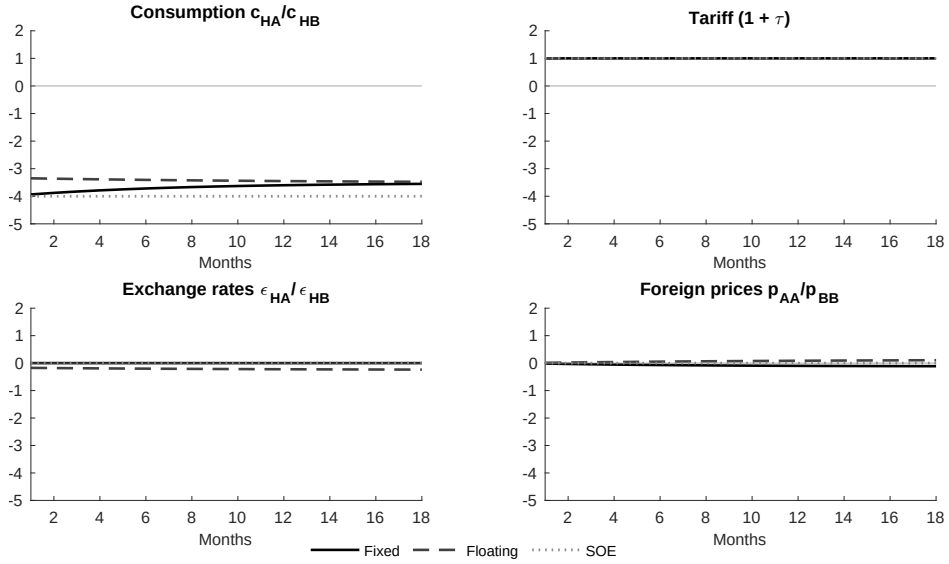


Figure E.7: Tariffs effect on Import Prices



The figure shows that there is a sizable difference in the measured trade elasticity in the short run, consistent with what we document in our empirical setting, where the US

and its trade partners had fixed exchange rates when Smoot-Hawley was enacted. The simulation shows that the difference arises from a difference in the relative changes in prices and the exchange rate. In the case of the economy with a floating exchange rate, the exchange-rate adjustment reduces the effect of tariffs on imports, and compensates for the slow adjustment in prices. In the fixed exchange-rate scenario, prices are rigid, so the effect on quantities is large and close to the value of the elasticity of substitution in the short run.

The figure also shows that the adjustment in foreign prices is key to understanding the dynamics of short-run trade elasticities. In that sense, the smaller is the local economy or the smaller is the trade share, the lower are the changes in prices of the other economy. Foreign producers' demand is not affected significantly by changes in demand in the economy that impose the tariff. Because of that lower demand, they don't adjust their prices to changes in the tariff rate. The implication is that the economy that imposes the tariff will end up paying most of the tariff. In the extreme case of a small open economy (shown by the dotted line), changes in foreign prices are zero, and because of the UIP condition, the exchange-rate gap between different destinations will also be zero. Because foreign economies are not affected by the tariff in the small open economy, their interest do not change, so changes of the exchange rate in the small open economy are the same across destinations. Therefore, the measured trade elasticity will be equal to the elasticity of substitution between goods, independent of the prevailing monetary policy regime.