Trade Policy as an Exogenous Shock: Focusing on the Specifics*

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Abstract

Per-unit trade costs feature prominently in international trade. Such costs differ from ad valorem trade costs in that, as price levels change, they generate quasi-random variation in protection *within* endogenously determined trade policy regimes. Using a newly digitized database encompassing the universe of tariff lines across five US trade policy regimes between 1900 and 1940, we document the extent of intra-policy variation created by the presence of per-unit, or *specific* tariffs. We show that price dynamics combine with industry reliance on specific tariffs to generate large swings in average industry tariff levels – up to 6.5 percentage points over five-year intervals. We leverage this variation to estimate the effect of changes in tariff protection on import growth and the subsequent effect of imports on local labor markets. At the industry level, we show that relative changes in protection are strongly predictive of import growth, while across labor markets we find that import growth reduces labor force attachment. It also affects the distribution of employment across industries, reducing growth in manufacturing employment but increasing it in agriculture and services. The effects of rising imports fall most heavily on the young.

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JEL classification numbers: F1, F6, N1, N7, J2

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1 Introduction

Increasingly, economists have turned their attention to international trade not only as an important phenomenon in its own right, but as a potential source of causal identification more broadly. Trade flows create variation in economic conditions across industries, firms, and occupations, which can then serve as a means to answer questions beyond trade specifically.[1] However, the usefulness of trade as a source of identification has been limited by both the endogenous nature of trade policy and the relative infrequency of large trade agreements. As such, the vast majority of the literature has focused on the post-1990 era in order to leverage once-in-a-generation supply shocks and a handful of abrupt changes to trade policy as sources of exogenous variation.[2] In this paper we propose a method to identify causal effects of trade on economic outcomes in the absence of such relatively infrequent events. We utilize this approach to examine the effects of trade on US labor markets between 1900 and 1940.

As is generally the case, ours is a setting in which tariff levels are endogenously linked to trade flows via their expected effects on domestic outcomes. Leveraging insights from the work of Crucini (1994) and Irwin (1998a,b), we propose an identification strategy for such settings that exploits unexpected changes in protection that occur *within* a specified trade policy regime. When a new tariff regime is instituted, identical levels of protection can be achieved with either specific – that is, nominal per-unit – tariffs, or ad valorem – percent – tariffs. However, the restrictiveness of specific tariffs varies inversely with the price level; inflation erodes protection while deflation enhances it. By contrast, the protection afforded by ad valorem tariffs is unaffected by price variation. Thus, pre-existing differences in the prevalence of specific tariffs across industries in conjunction with subsequent price movements generate quasi-random variation in realized protection over time *within* a trade policy regime. Due to the unpredictability of price movements, these changes are plausibly independent of the demand for protection.

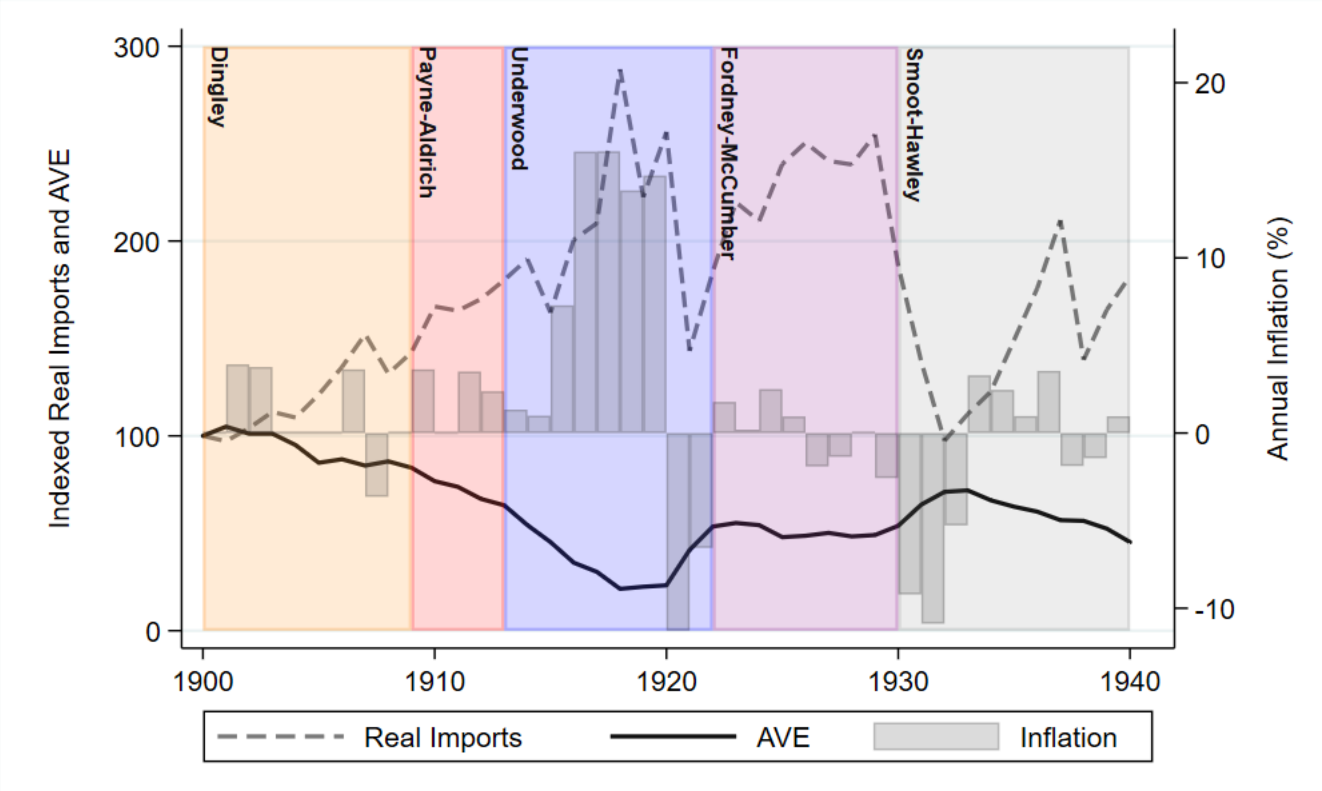
We present visual of evidence of the mechanism employed in the paper in Figure 1. Here, each

[1] See, e.g., Chetverikov et al. (2016), Feler and Senses (2017), Greenland et al. (2019), Autor et al. (2019), Pierce and Schott (2020), Erten and Keskin (2021) for recent examples.

[2] The influential analysis of Autor et al. (2013) links Chinese supply-driven variation in US import growth to US labor market outcomes. Similarly, a number of papers (Topalova, 2007; Kovak, 2013; Hakobyan and McLaren, 2016; Pierce and Schott, 2016; Handley and Limao, 2017; McCaig and Pavcnik, 2018) study sweeping liberalizations in which the magnitude of the industry level tariff change is plausibly unaffected by political lobbying.

of the five U.S. trade policy regimes of the early 20^{th} century is represented by a distinct colored vertical band.[3]

Figure 1: Real Imports, AVE, and Inflation: 1900-1940



Notes: AVE and import values from the USITC. Annual inflation reported in percent and calculated from the Jordà-Schularick-Taylor Macrohistory Database. Real imports and AVE have been indexed to 100 in 1900. Vertical bands indicate the years encompassed by Dingley Tariff of 1897, the Payne-Aldrich Tariff of 1909, the Underwood-Simmons Tariff of 1913, the Fordney-McCumber Tariff of 1922, and the Smoot-Hawley Tariff of 1930, respectively.

The dashed line represents annual real imports indexed to the year 1900, while the solid black line depicts the ad valorem equivalent (AVE) tariff rate, defined as the ratio of total duties to total import values. Naturally, across policy regimes we observe considerable changes in both average tariffs and trade flows. This type of cross-regime variation is the source of identification exploited in the vast majority of the literature on trade policy and economic outcomes. However, if trade barriers reflect the demand for protection, such variation is not suitable for identifying the effects of tariffs on trade or of trade on economic outcomes.[4] Instead, our identification relies on non-policy variation in the AVE tariff rate across years *within* a given policy regime. This within-regime

[3]These regimes correspond to the Dingley Tariff of 1897, the Payne-Aldrich Tariff of 1909, the Underwood-Simmons Tariff of 1913, the Fordney-McCumber Tariff of 1922, and the Smoot-Hawley Tariff of 1930.

[4]For an alternative approach, see Trefler (1993), who deals with endogenous trade policy directly by simultaneously estimating the demand for protection in conjunction with the effects of protection on imports.

variation is strongly and negatively correlated with inflation, depicted by gray bars. Periods with high inflation tend to be periods with low average tariff rates and high import growth *conditional on the pre-existing tariff regime*. We argue that the relationship is causal: in the presence of specific tariffs, inflation erodes the protective capacity of the existing tariff schedule, resulting in increased imports and attendant effects on other economic outcomes.

We explore this variation more rigorously by deriving an industry-level measure of intra-policy changes in "realized protection" that depends both on cross-industry differences in the reliance on specific tariffs and time series variation in price levels. In order to construct this measure for each trade policy regime in our sample, we digitize the universe of US tariffs by tariff type for every five years between 1900 and 1930. We manually concord tariff lines – approximately 3500 annually – to more aggregate industries and document substantial variation in the reliance on specific tariffs both within and across policy regimes. Though they are used most heavily on agricultural products, specific tariffs are ubiquitous in our sample.[5] They account for nearly 70% of all duties collected in the first year of the data, dropping to 38% in the 1910s and returning to nearly 60% with the Smoot-Hawley tariff in 1930.

When combined with price movements, specific tariffs generate substantial variation in AVE tariff levels over time within trade policy regimes. For example, between 1915 and 1920, when inflation reaches its in-sample peak, the erosion of protection afforded by specific tariffs leads to a 4.2 percentage point reduction in the average tariff – approximately one quarter of the initial AVE level. Conversely, as prices decline between 1925 and 1930, the average industry AVE increases by 1.8 percentage points. The overall variation we document is large: across our 40-year sample, the standard deviation of annualized five-year changes in realized protections is equal to approximately a one percentage point change in AVE levels.

After describing our data, we evaluate the importance of this variation in two applications. In the first, we estimate the effect of price-driven changes in realized protection on US industry import growth over five- and 10-year intervals. We find that a one standard deviation increase in protection decreases industry import growth by approximately one-third of a standard deviation. These effects are roughly 25% smaller over five-year windows than over 10 years, though they

[5] See Harrison (2018) for a detailed discussion of the differential use of specific tariffs across industries in the Smoot-Hawley era in particular.

are always statistically significant and economically meaningful.[6] These results obtain even after accounting for initial levels of protection as well as the initial industry reliance on specific tariffs.

In the second application, we quantify the effects of import competition on US labor markets from 1900 to 1940 in the full count US Census. We employ a shift share instrumental variables design (Bartik, 1991) in which we instrument for county-level log import growth with an employment-weighted average of industry-level changes in realized protection.[7] We find that increasing import exposure leads to reduced labor force participation, especially among the young. Further, we find that import competition retards manufacturing employment growth in favor of agriculture and services. This suggests a potential role for import competition in shaping the evolution of the US economy over space and time.

Our empirical strategy faces two primary identification concerns. The first is that our results may reflect other channels through which changing price levels differentially affect imports. If demand increases disproportionately during expansionary periods for goods relying on specific tariffs, for instance, this would mimic the mechanism we have in mind but would not be causally linked to changing tariff protection.[8] To evaluate this concern, we conduct two placebo exercises. First, we construct an analogous data set for UK industry trade flows to examine the relationship between changes in US tariff protection and UK imports. If changes in price levels disproportionately affect goods that tend to rely on specific tariffs independent of their effect on realized protection, we would expect to see a similar relationship between price changes and imports in the UK to those that we document in the US. We find no such relationship: US specific tariffs predict the response of US imports to changing prices, but not UK imports. Second, we collect additional import and tariff data to examine trade dynamics in the US from 1848 to 1860, a period in which US trade policy featured no specific tariffs. We find that specific tariffs introduced in 1861 are predictive of the industry import response to price changes *after*, but not *before* their implementation. This, again, suggests that it is specific tariffs themselves, rather than underlying industry characteristics,

[6] Such differences in the responsiveness of trade flows to trade costs over time have been noted previously. See, for example, Ruhl (2008) and Boehm et al. (2020).

[7] Note that we do not observe imports at the county level. Rather, as is standard in the literature on trade and local labor markets, we construct a proxy for county import competition by weighting national imports at the industry level by each industry's labor share within counties.

[8] To the best of our knowledge, such a possibility has not previously been explored.

that govern the differential response we observe.[9]

The second identification concern is that the changes in realized protection that we treat as random are, in fact, a reflection of the demand for protection (Trefler, 1993; Grossman and Helpman, 1994; Hiscox, 2002; McLaren, 2016). That is, politicians may choose a particular combination of ad valorem and specific duties in anticipation of their subsequent effects on realized protection.[10] We note that while it is likely that omitted variables such as political influence or expected industry growth affect average tariff levels, their correlation with intra-policy changes in tariff protection is less clear. The relative change in protection reflects both the direction and magnitude of price changes; endogenous trade policy along this dimension would thus require an accurate forecast of future price changes when politicians set the tariff schedule.

Even so, we take this concern seriously and present two pieces of evidence that suggest such endogenous tariff setting is not a primary driver of our results. First, we emphasize the inherent difficulty in forecasting inflation during this period. Crediting turn-of-the-century politicians with the ability to form inflation expectations using dynamic AR forecasts, we show that realized price growth differs substantially from these expectations. While it is possible that policymakers would choose ad valorem and specific tariffs with an eye toward future price movements, doing so with with any precision likely involved a forecast beyond the means of the era. Second, we document an extreme level of persistence in industry reliance on specific tariffs. As late as the Smoot-Hawley tariff in 1930, the structure of tariffs is strongly predicted by the tariff schedule under the Morrill Tariff of 1861. This suggests that reliance on specific tariffs in our sample largely reflects legislative inertia, rather than time-varying political economy concerns. As a final robustness exercise, we use this pre-Civil War reliance on specific tariffs to construct our measure of changes in realized protection – it, too, predicts US import growth from 1900 to 1940.

Our approach draws heavily on the insights of Crucini (1994) and Irwin (1998a,b), who argue that intra-policy variation in the ad valorem equivalent tariff rate is considerable, and is related to both specific tariffs and inflation. These findings motivate the higher frequency analysis of the

[9]Separately, we show that our results are robust to exploring heterogeneous responses across regions, suggesting that our results are not driven by the behavior of geographically-clustered sets of industries.

[10]Relatedly, Irwin (1998a) notes a strong party preference for duty type. Republicans were concerned with importers intentionally undervaluing their shipments to avoid duties. Such behavior was thought to put national budget balances at risk and consequently motivated Republicans to prefer specific tariffs.

effects of specific tariffs on aggregate output and investment (Crucini and Kahn, 1996), industry-level tariff wedges and imports (Bond et al., 2013), and prices (Harrison, 2018) for a subset of products surrounding the Smoot-Hawley tariff. This paper complements and extends existing work along several important margins. First, rather than focusing on a single trade policy event or a balanced panel of a subset of goods, we evaluate the importance of specific tariffs with data that covers the universe of duties, imports, and trade policy regimes for a 40-year period. By performing our analysis at higher level of aggregation, we are able to explore the effects of evolving protection among all industries during a sample spanning the first wave of globalization as well as the subsequent interwar trade collapse and rise in protectionism. Second, we provide direct evidence of the relationship between price movements and trade in the presence of specific tariffs and rule out alternative explanations via placebo analysis. Third, we trace industrial reliance on specific tariffs back to pre-Civil War trade policy. Finally, we provide the first evidence of the spatial effects of import competition on labor market outcomes during this period and evaluate its role in shaping the industrial composition of the early 20^{th} century American economy.

More generally, we connect to work emphasizing the importance of per-unit trade costs. Standard trade models commonly assume that trade costs take an "iceberg" form – that is, trade costs scale proportionately with the value of trade. However, it is well-known that such an assumption is not innocuous. For instance, Hummels and Skiba (2004) show that increases in per-unit trade costs increase the share of higher-priced goods exported. Sørensen (2014) shows in the context of a heterogeneous firms model that gains from increased trade openness are larger for reductions in per-unit costs than for reductions in iceberg costs. Our paper contributes to this literature by documenting a related, but distinct empirical fact: in the presence of per-unit trade costs, changes in nominal prices have reallocative effects on real outcomes. Our identification strategy is based on specific tariffs, but given the pervasiveness of per-unit trade costs of all kinds (Irarrazabal et al., 2015), we view this as an important contribution.

Our paper also adds to the extensive literature aimed at quantifying the effects of policy on trade and domestic economic activity. The empirical complications of trade policy evaluation highlighted by Goldberg and Pavcnik (2016) have led to a disproportionate focus on events involving sweeping, discrete changes in national trade policy (Pavcnik, 2002; Trefler, 2004; Topalova, 2007; Kovak, 2013;

Caliendo and Parro, 2015; Dix-Carneiro, 2016; Hakobyan and McLaren, 2016; Caliendo et al., 2022) in which the authors attempt to exploit quasi-random variation in the magnitude of tariff reductions, or a focus on narrower, industry-specific events (Khandelwal et al., 2013; Fajgelbaum et al., 2020; Flaaen and Pierce, 2021; Lake and Liu, 2021; Cox, 2022). Due to the proliferation of liberalization episodes in recent years, these papers have largely focused on post-1990 events.[11] By contrast, our approach allows us to quantify the effects of trade policy across multiple policy regimes in a consistent fashion, even if tariff levels reflect the demand for protection. This approach can be applied to any setting in which price variation exists and the tariff schedule includes specific tariffs.

Finally, we contribute to the literature focused on the spatial effects of globalization and its long run implications. Eriksson et al. (2021) employ a shift-share approach to detail the evolution of import exposure over time in the US and emphasize the importance of skill in combination with product cycles in explaining differential responses to the "China Shock." Candia and Pedemonte (2021) explore the effects of exchange rate shocks on economic activity in 200 cities in the U.S. surrounding the Great Depression. Heblich et al. (2021) evaluate reallocative effects of the repeal of the Corn Laws in the U.K. in a general equilibrium setting by exploiting spatial differences in arable land. Arkolakis et al. (2020) analyze the effects of immigration on US labor markets, innovation, and productivity in the early 20^{th} century US. Our paper contributes to this literature by providing support for the idea that trade played a key role in governing the transition from agriculture to manufacturing and services (McMillan and Rodrik, 2011; Erten and Leight, 2021) during a key period of growth in US manufacturing exports (Irwin, 2003).

The paper proceeds as follows. In section 2 we derive a simple measure of specific-tariff-induced variation in protection. In section 3 we describe the trade policy environment and present stylized facts about trade and duties from 1900 to 1940. We also construct and describe our primary measure of changes in realized tariff protection. In Section 4 we estimate the effect of changes in realized protection on industry import growth. We also conduct placebo exercises based on contemporaneous UK imports and on US imports surrounding the 1861 Morrill tariff. Section 5 details the effects of import competition on local labor market participation in the full count Census and explores heterogeneity across demographic groups. Section 6 outlines additional applications

[11]For exceptions, see, e.g., de Bromhead et al. (2019) and Alessandria et al. (2021).

for our approach and concludes.

2 Empirical Approach: Tariffs, Inflation, and Changes in Realized Protection

Trade barriers generally reflect both economic conditions and the demand for protection (Grossman and Helpman, 1994; Goldberg and Maggi, 1999), and the early 20th century US was no exception (Irwin and Kroszner, 1996; Irwin, 2017; Irwin and Soderbery, 2021). As a consequence, tariff levels, imports, and domestic outcomes are endogenously linked in a way that limits the usefulness of tariff levels as a source of identifying variation. In this section, we describe an approach that identifies plausibly exogenous variation in the protection afforded by a given tariff schedule by exploiting the structure, rather than the level of tariffs.

To fix ideas, suppose that at time t_0 policymakers select a combination of ad valorem tariffs, τ_v, and specific tariffs, f_v, for each good v. The ad valorem equivalent level of protection at time t_0 is thus

$$AVE_{vt_0} \equiv \tau_v + \frac{f_v}{p_{vt_0}} \tag{1}$$

Clearly, given knowledge of contemporaneous price levels p_{vt_0}, policymakers can achieve identical levels of protection with any combination of τ_v and f_v. The particular combination chosen for good v generates what we refer to as its "specific tariff share":

$$STS_{vt_0} \equiv \frac{f_v}{p_{vt_0}\tau_v + f_v}. \tag{2}$$

STS_{vt_0} represents the proportion of duties on good v generated by specific tariffs. Within a policy regime, this will change as a function of price levels. To see the importance of the specific tariff share, consider the price of an imported foreign variety of good v relative to a domestic variety, equal to one plus the ad valorem equivalent: $1 + \tau_v + \frac{f_v}{p_{vt_0}}$. Differentiating the natural logarithm of this measure and noting that within a policy regime $\partial\tau_v$ and ∂f_v are zero, one can show:

$$\partial Ln(1+\tau_v+\frac{f_v}{p_{vt_0}}) = \left(\frac{-\partial p}{p_{vt_0}}\frac{f_v}{p_{vt_0}}\right)\left(\frac{1}{1+\tau_v+\frac{f_v}{p_{vt_0}}}\right)$$
$$= \left(\frac{-\partial p}{p_{vt_0}}\right)\frac{f_v}{p_{vt_0}(\tau+\frac{f_v}{p_{vt_0}})}\left(\frac{\tau+\frac{f_v}{p_{vt_0}}}{1+\tau_v+\frac{f_v}{p_{vt_0}}}\right)$$
$$\approx -\Delta Ln(p_{vt})STS_{\nu t_0}\left(\frac{AVE_{\nu t_0}}{1+AVE_{\nu t_0}}\right). \tag{3}$$

In words, the log change in the relative price of a foreign variety is a function of the change in log price exclusive of tariffs, the good's specific tariff share, and its initial level of protection. Intuitively, for a given initial tariff level, price reductions will increase the ad valorem equivalent more when a larger share of the tariffs are nominally defined. This implies that once policymakers have chosen AVE_{vt_0} and STS_{vt_0}, the protection afforded good v in subsequent periods will depend on future price levels.

More specifically, as price levels rise, the relative foreign price falls. We would thus expect to observe greater import growth among goods more reliant on specific tariffs in the presence of inflation, and lower growth in the presence of deflation. Note, however, that if policymakers choose initial AVE levels as a function of expected future import growth, equation 3 will still be endogenously related to subsequent import growth. As such, we omit the final term from equation 3 in our baseline specifications and exploit only the quasi-random variation driven by specific tariffs and price changes.[12][13] We refer to this measure as capturing changes in "realized protection":

$$\Delta RP_{vt} \equiv -\Delta Ln(p_{vt}) * STS_{vt_0}. \tag{4}$$

To the extent that prices change unexpectedly, this measure is plausibly independent of the demand for protection, but will impact the level of protection a good receives, making it a suitable instrument for import growth.[14] In sections 4 and 5, respectively, we demonstrate the predictive

[12] Crucini (1994) explores variation in product-level tariff rates driven by three channels: legislative changes, changes in import prices in the presence of specific tariffs, and changes in product-level prices relative to the aggregate level. As our focus is on identifying the exogenous component of tariff changes, we focus on the second of these three channels.

[13] In robustness exercises we show that our findings obtain when using the entire term in equation 3.

[14] More formally, ΔRP_{vt} captures the percent change in the level of protection, AVE_{vt}, rather than the percent

capacity of this measure over industry import growth and use a county-level aggregate of ΔRP_{vt} as an instrument to assess the effect of import competition on local labor markets. We also evaluate the extent to which changes in price levels are unexpected, and whether our measure could be related to import growth through other channels. First, however, we turn to detailing the policy environment and the data sources used in constructing our measure of exposure.

3 Imports, Tariffs, and Prices in the U.S. from 1900-1940

From 1900 to 1940, US trade policy was characterized by five distinct regimes. The Dingley Tariff of 1897 was replaced by the Payne-Aldrich Act of 1909, followed by the Underwood-Simmons Tariff of 1913, the Fordney-McCumber Tariff of 1922, and ultimately the Smoot-Hawley Tariff of 1930.[15] We are, of course, not the first to study disaggregate measures of specific tariffs in these settings (Crucini, 1994; Bond et al., 2013; Harrison, 2018; Crucini and Ziebarth, 2022), but in what follows we describe the most comprehensive database of tariff rates over this period.[16]

Our identification comes from changes in realized tariff protection driven by cross-industry variation in reliance on specific tariff shares and time series variation in price levels. To operationalize this idea, we construct a novel database of tariffs and trade flows in the US by digitizing annual editions of *Foreign Commerce and Navigation of the United States* (FCNUS) every five years between 1900 and 1930 and the *Statistical Abstract of the United States* (SAUS) every year between 1900 and 1940. From these we obtain information on the value of imports, duties collected, and the type of duty at the tariff-line level.[17] To allow for mapping to more aggregate employment data, we manually concord each product to its 2-digit Standard International Trade Classification

change in the price of a foreign variety relative to a domestic variety, $1 + AVE_{vt}$.

[15] Due to its short duration, we omit the Emergency Tariff Act of 1921, which was replaced by September of the following year.

[16] Both Crucini (1994) and Bond et al. (2013) construct tariff line-level databases which for a subset of items that can be linked over time. Bond et al. (2013) construct such data from 1926-1934 to evaluate the effects of Smoot-Hawley in propagating the Great Depression. Both Harrison (2018) and Crucini and Ziebarth (2022) rely on these data. Crucini (1994) studies the 1900-1940 period but restricts his analysis to 29 commodities for which he is able to construct a balanced panel. Because we are focused on an industry-level measure of exposure, we need not restrict our attention to a balanced panel of goods. As a result, we are able to focus on the entire set of imported goods and duties in each of these policy regimes.

[17] Products with compound duties – that is, featuring both ad valorem and specific duties – are classified as having specific duties when constructing STS_{vt}. An example of the pre-digitized *Foreign Commerce and Navigation of the US* data used to construct our primary measure can be found in Appendix B.1.

(SITC) Revision 2 counterpart.[18]

To provide a sense of the cross-policy variation present in our sample, we present aggregate policy-level AVE tariff rates, as well as specific tariff shares, in Table 1. The table also includes the number of unique tariff lines used to construct these measures, as well as the number of SITC industries to which they are concorded.

Table 1: Reliance on Specific Tariffs by Policy Regime

Year	Policy	AVE_t	STS_t	Industries	Products
		Panel A: 1900-1930			
1900	Dingley	0.27	0.67	33	2113
1905	Dingley	0.23	0.64	33	2352
1910	Payne-Aldrich	0.21	0.57	34	3780
1915	Underwood	0.12	0.38	34	2403
1920	Underwood	0.07	0.45	34	2584
1925	Fordney-McCumber	0.13	0.58	34	5071
1930	Smoot-Hawley	0.15	0.59	34	4601
		Panel B: 1848-1861			
1848	Walker	0.21	0.00	29	302
1861	Morrill	0.16	0.76	29	407

Notes: AVE_t and STS_t are value-weighted policy aggregates of equations 1 and 2. Industries are aggregations of 2-digit Rev. 2 SITC industries, as detailed in Appendix A. Data digitized from the Foreign Commerce and Navigation of the United States – detailed sources can be found in Appendix tables B1 for 1900-1940 and in table B3 for 1848-1861.

Focusing on Panel A, we see that the aggregate AVE tariff varies considerably during our sample. Beginning with the Dingley Tariff of 1897, the overall AVE rate sits at 27%, then declines somewhat to 21% with the implementation of the Payne-Aldrich Act of 1909 before plummeting to 7% by 1920 under the Underwood-Simmons Tariff. The Fordney-McCumber Tariff of 1922, followed by the Smoot-Hawley Tariff of 1930, increase the level back to 15%. Crucially for our identification strategy, specific tariffs feature prominently across all policy regimes. Save for the Underwood-Simmons Tariff era in 1915 and 1920, the share of tariff revenue generated by specific tariffs never falls below 50%. At their minimum in 1915, specific tariffs still generate 38% of all tariff revenue.

[18] Due to the absence of an official trade classification system until our 1925 sample, data can only be linked over time via product name. This is a time-intensive process that requires a consistent mapping for nearly 25,000 tariff line observations. Given our need to match tariffs and imports from the FCNUS to imports in the SAUS as well as UK import unit values in the Statistical Abstract for the United Kingdom, we aggregate the data to a consistent set of industries. These industry groups are slightly more aggregate than the 2-digit SITC revision 2 classification and are detailed in full in Appendix A.

Specific tariffs were not always so widely used as a trade policy tool. For a 15-year period following the Walker Tariff of 1846, specific tariffs were wholly absent from the tariff code. They were re-introduced with the Morrill Tariff of 1861 and have been used in some capacity ever since. While we defer the details of this discussion until later, we use data from this era in placebo and robustness exercises.[19] As such, we also digitize tariff-line data on trade flows, tariffs, and tariff type from 1848 to 1861.[20] In Panel B of the table we report AVE tariffs and specific tariff shares for both policies. In addition to re-introducing specific tariffs, the Morrill Tariff reduced the AVE tariff considerably.[21]

While the cross-policy variation in AVE tariffs highlighted above is substantial, our identification strategy does not require it. Instead, it is cross-industry differences in the prevalence of specific tariffs that offer our primary source of identifying variation. Nonetheless, to summarize both sources of variation more completely, in Figure 2 we display the relationship between the AVE, STS, and import share by policy regime from 1900 to 1930 at the industry level.[22] Each circle represents an SITC industry, with a size proportional to its share of imports. On the horizontal axis we plot the AVE level for that industry, while the vertical axis depicts the industry's specific tariff share. Additionally, we plot the overall AVE as a vertical red dashed line. The vertical black line indicates a 50% AVE to emphasize differences in scale across years.

Though it needn't be the case, AVE and STS are weakly positively correlated under each policy regime.[23] However, for any given level of protection there is substantial variation in the extent to which it is provided by specific tariffs. For instance, consider "Sugar, sugar preparations and honey" (SITC 06) relative to "Textile yarn, fabrics and made-up articles" (SITC 65) under the Payne-Aldrich Tariff. Both industries face an AVE rate of approximately 50%. However, the share of specific tariffs in sugar is twice as high as the share in textile products. In the face of rising prices, the realized rate of protection for textiles remains much higher during the subsequent

[19] The Tariff of 1857 was enacted during this period as well, but it too featured no specific duties.

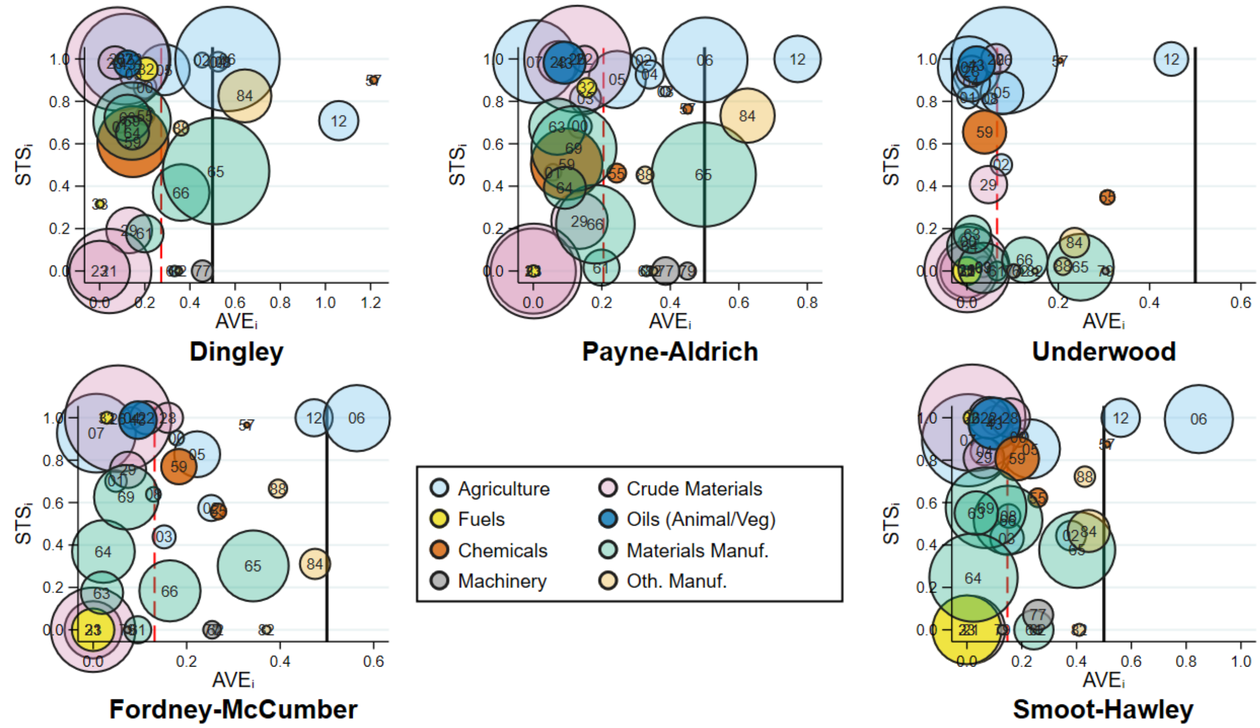
[20] These data are detailed extensively in Appendix B.2.

[21] As noted by Flaherty (2001), the Morrill Tariff is often portrayed as representing a considerable increase in protection. Flaherty argues that this is in large part due to subsequent increases in tariffs used to raise revenue during the Civil War. Additionally, note that our calculation of the AVE tariff rate reflects the tariffs only on products with non-zero trade flows.

[22] In regimes during which we observe multiple years, our figures display the first year available. For example, 1900 and 1905 both fall under the Dingley Tariff, so we construct the figure based on the 1900 observations.

[23] These range from 0.15 under the Underwood-Simmons Tariff to 0.24 under the Payne-Aldrich Act.

Figure 2: Industry level STS_i versus AVE_i by Policy Regime



Notes: Figure displays specific tariff share (STS_i) versus the ad valorem equivalent (AVE_i) for each trade policy regime. Industries are two digit Rev. 2 SITC industries. Marker size is proportional to share of start of period imports. Solid vertical lines indicate a 50% ad valorem equivalent tariff while dashed lines indicate policy-level ad valorem equivalent tariff.

decade than that of sugar, despite the fact that they share the same average initial tariff level. This variation allows us to exploit changes in realized protection while controlling for the initial AVE tariff.

Finally, we note that even as AVE tariffs change across policies, industry specific tariff shares are highly persistent. One can see, for example, that products for human consumption (agricultural, food, and tobacco products, SITCs 00-12) tend to rely heavily on specific tariffs, while material manufactures tend to hover in the middle of the STS range.[24] Indeed, cross-policy correlation in industry specific tariff shares never falls below 0.5. This persistence extends beyond our primary sample – the industry specific tariff shares for the five regimes between 1900 and 1940 are highly correlated with those specified by the Morrill Tariff of 1861. This persistence suggests limited use of changes in tariff type as a means of addressing time-varying political economy concerns. We return to this persistence in section 4.1 below.

[24] Because our sample spans the Prohibition era, we drop SITC 11, which is comprised primarily of alcohol.

3.1 Prices, 1900-1940

Temporal variation in our measure of realized protection is driven by changes in the dollar price of US imports over time. Our identification strategy requires that the relationship between prices and imports operates through the effect on realized protection, and not, for example, through unobserved domestic demand shocks. Because US prices are more likely to reflect such shocks, we emphasize variation in foreign price levels. Similarly, as product-level prices are jointly determined by product-level demand and supply shocks, as a baseline we exploit more aggregate price variation that is plausibly exogenous to product-level import values. As a proxy for aggregate foreign price levels, we use the United Kingdom aggregate consumer price index, which we obtain from the Jordà-Schularick-Taylor Macrohistory Database (Jordà et al., 2017).[25]

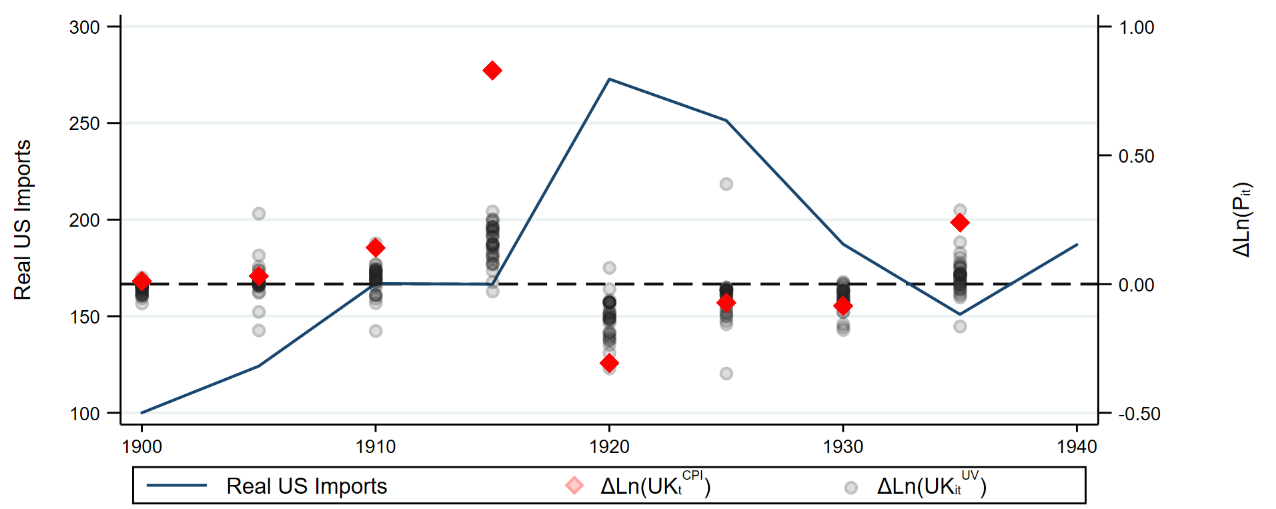
The drawback of aggregate price indices is of course that they do not allow us to explore differential industry-level price movements. Within-period variation in our measure of realized protection is thus solely driven by cross industry-differences in specific tariff shares. If industry price growth is non-uniform, then our industry-level measure of realized protection will be measured with error. To address this shortcoming, we also construct industry measures of price growth by digitizing annual UK product-level import values and quantities from 1900 to 1938.[26] As with our US sample, we manually concord these data to the two-digit SITC revision 2 classification, and construct industry log price growth from import unit values. The industries for which we are able to construct prices cover 98.5% of the value of US imports in our sample.[27] For industries in which we are unable to construct a price measure due to inadequate data, we utilize the aggregate UK CPI as our measure of industry price growth.

[25] http://www.macrohistory.net/data/. As a further robustness exercise, in unreported results we also construct prices for a "rest of world" index based on prices in Australia, Canada, Denmark, France, Italy, Japan, the Netherlands, Norway, Spain, Sweden, Switzerland, and the United Kingdom, also from Jordà et al. (2017). We drop Finland, Germany, Belgium, and Portugal from this dataset as countries that experience multiple years of inflation greater than 50% in our sample. We also conduct additional robustness exercises using the US CPI from the same database and import unit values from the Census volume *Historical Statistics of the United States*. Specifically, the data come from Series 225-258 in Chapter U at https://www.census.gov/library/publications/1975/compendia/hist_stats_colonial-1970.html. Our results are qualitatively unchanged by these measures.

[26] Data are taken from annual editions of the "Statistical Abstract for the United Kingdom", which is not available for 1940.

[27] As detailed in appendix section B.3, we construct these as import-weighted averages of product-level log price growth. As such, we must address changes in the set of products and units of reporting across years. This prevents us from constructing measures for SITC 57 and 82 for our entire sample, for SITCs 00, 32, 55, 77, and 88 for two cross sections, and for SITC 62 for three cross sections. These observations account for less than 1.5% of US imports during our sample.

Figure 3: Real Imports and Price Changes, 1900-1940



Notes: Real US imports, indexed to 100 in 1900, are plotted on the left y-axis. Annualized 5-year changes in log prices are plotted on the right y-axis. For each 5-year period the red-diamond indicates the change in log UK CPI calculated using data from Jordà et al. (2017) while the circles reflect industry-level changes in log import unit-values constructed from digitized versions of the Statistical Abstract for the United Kingdom and detailed in Appendix B.3. Disaggregate information on industry import levels and import growth during our sample may be found in section C.

Figure 3 displays the evolution of price levels throughout our sample, as well as US aggregate real imports. The figure depicts annualized five-year changes in both the aggregate UK CPI as well the industry-level UK import unit values. As is clear from the figure, both prices and imports rise for the first half of our sample, then fall throughout the second half due to the depression of 1920-21 and the Great Depression. As expected, industry-level unit values move with the UK price index, but exhibit substantial variation around the average.

4 US Import Growth and Changes in Realized Protection

We now turn to the industry-level relationship between realized protection and imports. Table 2 reports industry-level summary statistics for each five-year period in our sample.[28] As shown in Figure 3 above, prices rose between 1900 and 1920. This, in turn, implies that realized protection fell during these years. For instance, price growth between 1915 and 1920 corresponds to a reduction in $\Delta RP_{it} \equiv -\Delta Ln(UK_t^{CPI})STS_{it_0}$ of roughly 6.1% annually. As a consequence, industry imports increase by 8.1 log points annually during these five years. This pattern, with rising prices, falling

[28]Detailed information on industry imports and import growth can be found in figures C1 and C2 of Appendix C.

realized protection, and rising imports, holds more broadly prior to 1920. Similarly, as prices collapse and realized protection rises after 1920, industry import growth falls. Whether measured by UK CPI or UK import unit values (UV), changes in realized protection move opposite import growth.[29]

Table 2: Summary Statistics: US Industry Imports, AVE_{it_0}, ΔRP_{it}

	1900	1905	1910	1915	1920	1925	1930	Total
$\Delta Ln(Imports^{US}_{it})$	0.045	0.100	0.010	0.081	-0.009	-0.022	-0.044	0.023
	(0.074)	(0.126)	(0.134)	(0.105)	(0.097)	(0.066)	(0.089)	(0.112)
$-\Delta Ln(UK^{CPI}_{t})STS_{it_0}$	-0.001	-0.004	-0.016	-0.061	0.023	0.008	0.010	-0.006
	(0.001)	(0.002)	(0.011)	(0.068)	(0.026)	(0.006)	(0.006)	(0.038)
$-\Delta Ln(UK^{UV}_{it})STS_{it_0}$	0.007	-0.012	-0.024	-0.058	0.054	0.021	0.029	0.003
	(0.017)	(0.042)	(0.037)	(0.074)	(0.078)	(0.069)	(0.037)	(0.065)
AVE_{it_0}	0.303	0.256	0.238	0.139	0.091	0.175	0.204	0.200
	(0.279)	(0.221)	(0.191)	(0.162)	(0.111)	(0.153)	(0.196)	(0.202)
STS_{it_0}	0.647	0.593	0.557	0.369	0.377	0.549	0.574	0.523
	(0.364)	(0.371)	(0.384)	(0.412)	(0.418)	(0.394)	(0.380)	(0.397)

Notes: Table presents summary statistics for 5-year industry import growth and changes in realized protection at the industry level. All variables have been annualized. Variable means are reported above standard deviations which are reported in parenthesis.

We display the relationship between annualized changes in industry realized protection and import growth visually in Figure 4.[30] The left panel utilizes the UK aggregate CPI for price variation, while the right panel exploits changes in industry-level unit values. In each case the pattern is clear: within and across policy regimes, rising prices lead to falling protection, which is associated with increases in imports.

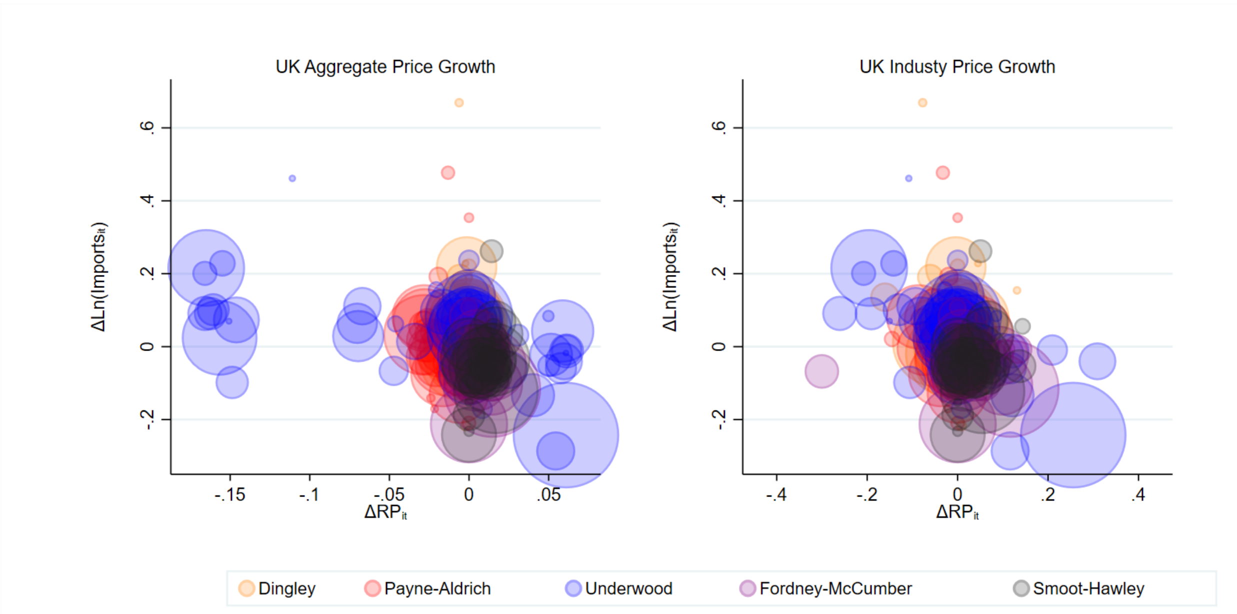
More formally, we estimate our baseline regression, in which we relate annualized changes in import growth to annualized changes in realized protection:

$$\Delta Ln(Imports^{US}_{it}) = \beta_0 + \beta_1 \Delta RP_{it} + \Gamma X_{it_0} + \eta_t + \epsilon_{it} \quad (5)$$
$$\Delta RP_{it} \equiv -\Delta Ln(p_{it}) STS_{it_0}.$$

Standard errors are clustered at the SITC 2-digit level. We present our findings in Table 3, sequentially introducing controls across columns.

[29]An analogously constructed table of 10-year changes may be found in C1.
[30]Imports have been deflated by the US CPI.

Figure 4: Annualized Industry Log Import Growth vs ΔRP_{it}.



Notes: Figure displays annualized 5-year industry import growth against annualized changes in realized tariff protection as defined in equation 4. The left panel constructs changes in realized protection, ΔRP_{it} using aggregate UK price growth and the right panel uses UK industry unit value log price growth constructed from digitized versions of the Statistical Abstract for the United Kingdom and detailed in Appendix B.3. Marker size is proportional to start of period real imports.

As we are ultimately interested in an analysis of decadal labor market changes, our baseline regressions employ 10-year changes in log import growth. In column 1 we use the aggregate UK CPI to construct ΔRP_{it} and include only decade fixed effects to absorb the impact of aggregate shocks to prices and imports. As expected, rising protection is associated with relative declines in import growth. The effect is statistically significant at conventional levels and economically meaningful: a one standard deviation increase in ΔRP_{it} is associated with a relative reduction in import growth of 0.31 standard deviations.[31] In column 2, we condition on the initial AVE_{it_0} level to account for any differential response among goods with different initial levels of protection. Higher levels of protection are associated with lower subsequent import growth, but inclusion of this control has little impact on our primary explanatory variable. In column 3 we include the initial industry STS_{it_0} to account for the possibility that pre-existing differences in reliance on specific tariffs may be related to subsequent import growth. This, too, leaves our primary result largely unaltered.

[31]The standard deviation of 10-year changes in realized protection is 0.032 using the UK CPI and .053 using industry prices, while a standard deviation increase in annualized 10-year log import growth is 0.08. Full summary statistics for 10-year changes in imports can be found in C1.

Table 3: Baseline Analysis of US Import Growth and ΔRP_{it}^{US}

	$\Delta Ln\left(Imports_{it}^{US}\right)$						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
ΔRP_{it}	-0.766**	-0.809**	-0.799**	-0.427**	-0.446**	-0.456**	-0.453*
	(0.374)	(0.360)	(0.353)	(0.191)	(0.194)	(0.205)	(0.242)
AVE_{it_0}		-0.060**	-0.060**		-0.059**	-0.064**	-0.064**
		(0.028)	(0.029)		(0.028)	(0.028)	(0.028)
STS_{it_0}			0.002			0.018	0.018
			(0.015)			(0.017)	(0.017)
$\Delta Ln(P_{it})$							0.004
							(0.165)
Standardized Coeff.	-.313	-.331	-.327	-.284	-.296	-.303	-.302
R^2	0.259	0.277	0.271	0.264	0.282	0.284	0.278
Obs.	135	135	135	135	135	135	135
Price Growth	UK_t^{CPI}	UK_t^{CPI}	UK_t^{CPI}	UK_{it}^{UV}	UK_{it}^{UV}	UK_{it}^{UV}	UK_{it}^{UV}
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Weighted	Equal	Equal	Equal	Equal	Equal	Equal	Equal
Δt	10-year	10-year	10-year	10-year	10-year	10-year	10-year
Period	1900-40	1900-40	1900-40	1900-40	1900-40	1900-40	1900-40

Notes: Dependent variable is annualized log change in US industry imports constructed from 10-year changes. ΔRP_{it} is change in realized protection which is the US industry specific tariff share times the negative price growth. Measures of price growth used in constructing ΔRP_{it} are indicated in the footer of the table: columns 1-3 employ UK CPI, while columns 4-7 use UK industry import unit values in columns. Standard errors clustered at 2-Digit SITC level and reported in parenthesis. *, **, *** indicate $p < .1$, $p < .05$, $p < .01$ respectively.

In columns 4 through 7, we use industry-level price variation based on changes in UK import unit values to construct our measure of ΔRP_{it}. Columns 4 through 6 replicate columns 1 through 3 with this alternative measure. Although the magnitude of the coefficient on our primary variable is halved, the implied standardized effect is quite similar to that of the more aggregate measure. Column 6, for instance, implies that a one standard deviation increase in realized protection is associated with a 0.30 standard deviation decrease in import growth.

As before, time fixed effects capture common shocks to industry import growth and aggregate price levels. However, our measure of realized protection now varies across industries not only as a function reliance on specific tariffs, but also based on the magnitude of industry-level price changes. In column 7 we control for these price changes directly. Unconditionally, this variable is strongly and negatively correlated with our primary variable of interest, changes in realized protection (ρ=-0.82). As such, its inclusion increase the standard error on ΔRP_{it}, but has no effect on the magnitude of its point estimate. That is, our measure is not simply capturing the direct effect of changing import prices, but rather the differential response to price shocks among goods reliant on specific tariffs for protection.

Table 4: Robustness of US Import Growth and ΔRP_{it}^{US}

	$\Delta Ln\,(Imports_{it}^{US})$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ΔRP_{it}^{US}	-0.900**	-1.195**	-0.553**		-0.497*	-0.707***	-0.544**	
	(0.344)	(0.484)	(0.248)		(0.262)	(0.185)	(0.230)	
AVE_{it_0}	0.017	-0.026	-0.062**		0.010	-0.041**	-0.066**	
	(0.056)	(0.020)	(0.030)		(0.052)	(0.017)	(0.030)	
STS_{it_0}	-0.002	-0.036*	0.012	0.005	0.015	-0.000	0.015	0.012
	(0.032)	(0.020)	(0.017)	(0.016)	(0.035)	(0.010)	(0.018)	(0.016)
$\partial Ln(1+AVE_{it})$				-2.652*				-1.563**
				(1.386)				(0.681)
$Ln(1+AVE_{it_0})$				-0.118***				-0.102**
				(0.040)				(0.038)
$\Delta Ln(P_{it})$					0.089	-0.002	0.265**	0.065
					(0.233)	(0.108)	(0.105)	(0.094)
Standardized Coef.	-.368	-.628	-.262	-.233	-.33	-.678	-.258	-.203
R^2	0.256	0.533	0.199	0.263	0.278	0.620	0.221	0.262
Obs.	135	135	236	135	135	135	236	135
Price Growth	UK_t^{CPI}	UK_t^{CPI}	UK_t^{CPI}	UK_t^{CPI}	UK_{it}^{UV}	UK_{it}^{UV}	UK_{it}^{UV}	UK_{it}^{UV}
Weighted	Equal	Value	Equal	Equal	Equal	Value	Equal	Equal
Industry FE	Yes	No	No	No	Yes	No	No	No
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Δt	10-year	10-year	5-year	10-year	10-year	10-year	5-year	10-year
Period	1900-40	1900-40	1900-30	1900-30	1900-40	1900-40	1900-30	1900-40

Notes: Dependent variable is annualized change in US real industry imports taken over 5 years in columns 3 and 7 and over 10 years in all remaining columns. ΔRP_{it} is change in realized protection which is the US industry specific tariff share times the negative price growth. Annualized changes in price levels are based on the aggregate UK CPI in column 1-4 and UK industry import unit values in columns 4-8. $\partial Ln(1+AVE_{it}^{US})$ is the change in the tariff inclusive price of a foreign variety defined by equation 3. Standard errors clustered at 2-Digit SITC level and reported in parenthesis. *, **, *** indicate $p < .1$, $p < .05$, $p < .01$ respectively.

In Table 4, we explore the robustness of these results to a number of alternative specifications. In column 1, we repeat column 3 of Table 3 and addtionally introduce SITC-2 industry fixed effects. The point estimate of interest increases slightly, from -0.79 to -0.90, and remains significant at the 5% level. In column 2, we weight observations by start-of-period import values. The magnitude of the effect increases to -1.195, suggesting a larger elasticity among industries making up a larger portion of US imports. In column 3, we explore annualized five-year changes in imports and analogous measures of realized protection. Here, too, we observe a significant, negative, and economically meaningful effect. The estimate implies that a one standard deviation increase in realized protection leads to a 0.26 standard deviation decrease in import growth at the industry level. Notably, this effect is smaller in magnitude than the analogous 10-year change, consistent with the idea that imports respond to price-driven changes in trade costs more over time (Boehm et al., 2020). In column 4, we calculate changes in realized protection based on the complete measure derived in equation 3, including the initial AVE_{it_0}.[32] While the interpretation of this variable is different than our baseline, it is still economically and statistically significant predictor of changes in log import growth.

Finally, we repeat columns 1-4 exploiting industry-level price variation. None of these changes to our baseline specification qualitatively impact our findings – inflation erodes the protective capacity of specific tariffs and leads to rising import growth.[33]

4.1 Placebo Exercises: UK Imports and The Morrill Tariff of 1861

The preceding results document a differential response to price movements among industries reliant on specific tariffs. While we argue that this is driven by changes in realized protection, there are several potential alternative explanations. First, industries that rely on specific tariffs might be more responsive to price changes than those that rely on ad valorem tariffs for reasons unrelated to trade policy. If this were the case, as prices rise during economic expansions, imports would rise by more among goods reliant on specific tariffs. Similarly, as prices fell during contractions, imports would fall by more in such sectors. Such a pattern mimics the one we find here, though it is driven by cross-industry differences in cyclicality, rather than the response to trade costs. Second, if politicians are able to correctly forecast inflation, they might use this forecast when choosing tariff types in order to protect certain industries. If this is true, then our approach is subject to the same political economy concerns as studies using average tariff levels as a source of identification. We consider each of these possibilities in turn.

We begin by exploring analogous results to those described above in a separate market, namely the UK. As discussed in detail in de Bromhead et al. (2019), for much of this period British trade was generally liberal, with exceptions for revenue generation. Beginning in the late 1920s, tariffs rose sharply, with newly added tariffs disproportionately taking an ad valorem form. Given

[32] Specifically, our measure is $\Delta RP_{it} \equiv -\Delta Ln(UK_t^{CPI})STS_{it_0}\left(\frac{AVE_{it_0}}{1+AVE_{it_0}}\right)$

[33] We have also estimated our entire baseline Table 3 weighting all specifications by start-of-period import share, as well as using the full measure derived in equation 3. We find qualitatively similar results, available upon request. In Figure C3 we present estimates of our baseline estimating equation (columns 3 and 7, respectively, from Table 3) in which we sequentially drop each 2-digit SITC industry in order to ensure that our results are not systematically driven by a particular sector. Similarly in figure and C4 we estimate all columns of table 3 dropping each decade sequentially to ensure that our results are not driven by any one period.

the differences in tariff codes between the two markets, UK imports are not subject to the same changes in realized import protection as US imports. However, to the extent that underlying product characteristics rather than specific tariffs themselves drive our results, we would expect to observe a similar relationship between prices and imports in the two markets as a function of *US* specific tariff shares. To address this possibility, we digitize UK imports from 1900 to 1938 and repeat the preceding analysis in that setting.[34] Specifically, we regress both 10-year and five-year changes in UK industry log imports between 1900 and 1938 on changes in *US* realized tariff protection. As before, standard errors are clustered at the SITC-2 industry level. The results of this exercise are presented in Table 5.

Table 5: Placebo Analysis of UK Import Growth and ΔRP_{it}^{US}

	$\Delta Ln\left(Imports_{it}^{UK}\right)$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ΔRP_{it}^{US}	0.325	0.332	0.207	0.223	-0.093	0.087		0.069
	(0.351)	(0.348)	(0.348)	(0.376)	(0.396)	(0.244)		(0.220)
$AVE_{it_0}^{US}$		0.007	0.011	-0.037	-0.011	0.019		0.011
		(0.013)	(0.015)	(0.055)	(0.010)	(0.023)		(0.014)
$STS_{it_0}^{US}$			-0.016	-0.031	0.011	-0.021	-0.020**	-0.019*
			(0.010)	(0.032)	(0.020)	(0.013)	(0.009)	(0.010)
$\partial Ln(1+AVE_{it}^{US})$							-0.160	
							(1.450)	
$Ln(1+AVE_{it_0}^{US})$							0.012	
							(0.021)	
R^2	0.079	0.071	0.079	0.018	0.258	0.083	0.075	0.076
Obs.	120	120	120	120	120	211	120	120
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	No	No	No	Yes	No	No	No	No
Price Growth	US_t^{CPI}	US_t^{CPI}	US_t^{CPI}	US_t^{CPI}	US_t^{CPI}	US_t^{CPI}	US_t^{CPI}	US_t^{UV}
Weighted	Equal	Equal	Equal	Equal	Value	Equal	Equal	Equal
Δt	10-year	10-year	10-year	10-year	10-year	5-year	10-year	10-year
Period	1900-38	1900-38	1900-38	1900-1938	1900-38	1900-30	1900-38	1900-38

Notes: Dependent variable is annualized log change in UK industry imports constructed from 10-year and 5-year changes. ΔRP_{it}^{US} is change in realized protection which is the US industry specific tariff share times the negative price growth. Annualized changes in price levels are based on the aggregate US CPI in column 1-7 and US import unit values in column 8. $\partial Ln(1+AVE_{it}^{US})$ is the change in the tariff inclusive price of a foreign variety defined by equation 3. Columns 1-3 replicate the same columns in table 3, while columns 4-8 replicate the robustness specifications found in columns 1-5 of table 4. Standard errors clustered at 2-Digit SITC level and reported in parenthesis. *, **, *** indicate $p < .1$, $p < .05$, $p < .01$ respectively.

Columns 1 through 3 replicate our baseline results from the first three columns of Table 3, while column 4-8 replicate columns 1-5 of Table 4.[35] The contrast in results across the two markets

[34] Details of these data may be found in Appendix B.3

[35] Here, we employ the US CPI and US import unit values to construct changes in realized protection to avoid the same endogenous relationship between UK imports and prices that motivates the use UK prices in our US import

is stark. UK import growth is not related to changes in realized protection, measured using US specific tariff shares, in any specification. Indeed, the direction of the relationship is reversed in six out of the eight specifications. That is, changes in US realized protection predict import growth in the US, but not the UK. This suggests that unobserved product-specific characteristics do not drive our results.

As a second placebo, we turn our attention to an environment in which we do not need to rely on import data from a separate economy. Beginning with the Walker Tariff of 1846, the United States relied solely on ad valorem tariffs for a period of 15 years. In March of 1861, specific tariffs were re-introduced as a policy tool under the Morrill Tariff, after which they remained a prominent feature of US trade policy.[36] If industries that rely on specific tariffs respond differently to price changes for reasons other than changes in realized protection, this should be apparent in the years preceding the Morrill Tariff even though no specific tariffs were in place in these years.

To explore this possibility, we digitize product-level imports between 1848 and 1860 from annual editions of *Commerce and Navigation of the United States*. In 1861, we digitize imports and duties under the Morrill Tariff from the same source. As above, we concord these data to the 2-digit SITC level and deflate them using the US CPI.[37] For each industry, we calculate the ad valorem equivalent and specific tariff share under the Morrill Tariff – that is, as of 1861. Using the UK wholesale producer price index to measure inflation, we calculate *pseudo* changes in realized protection between 1848 and 1860 from the yet-to-be-enacted Morrill Tariff.[38] We estimate the relationship between industry import growth and these pseudo changes in realized protection as follows:

growth setting. We have also estimated these specifications utilizing UK CPI and industry unit values and still find no predictive power of changes in US realized protection on UK import growth. These results are available upon request.

[36]This policy was repeatedly amended to reflect the onset and growing financial costs of the US Civil War.

[37]Product classifications are detailed in Appendix section A and details on the import and tariff data from this period are documented in Appendix section B.2.

[38]UK CPI data from the Jordà-Schularick-Taylor database are not available during this period. We use the UK PPI as trade data are only available for fiscal years during this period, and inflation using the PPI can be constructed to match this. The PPI is available from Federal Reserve of St. Louis: https://fred.stlouisfed.org/series/WPPIUKQ.

$$\Delta Ln(Imports_{it}) = \beta_0 + \beta_1 \Delta RP^{Morrill}_{it} + \beta_2 AVE^{Morrill}_{i} + STS^{Morrill}_{i} + \eta_t + \epsilon_{it} \qquad (6)$$

$$\Delta RP^{Morrill}_{it} \equiv -\Delta Ln(p_t) STS^{Morrill}_{i}$$

β_1, our point estimate of interest, captures the differential import response to price movements among industries that will ultimately rely more heavily on specific tariffs, but do not during the period under study. If such industries respond differently to price shocks independent of the channel we propose above, we would expect the coefficient to be negative and significant.

Table 6: Placebo Analysis of US Import Growth and *Psuedo* ΔRP^{US}_{it}

	$\Delta Ln\left(Imports^{US}_{it}\right)$				
	(1)	(2)	(3)	(4)	(5)
Pseudo $\Delta RP^{Morrill}_{it}$	0.880	2.318*	0.909	6.114*	-7.503
	(1.059)	(1.191)	(1.259)	(3.293)	(5.680)
AVE^{Morril}_{i}	-0.277*	-0.291*	-0.277*	-0.282*	-0.242
	(0.163)	(0.160)	(0.161)	(0.165)	(0.161)
$STS^{Morrill}_{i}$	0.007	0.034	0.007	0.106	-0.157
	(0.056)	(0.060)	(0.055)	(0.072)	(0.135)
R^2	0.026	0.000	-0.007	0.073	0.018
Obs.	352	175	116	87	57
Price Growth	UK^{PPI}_t	UK^{PPI}_t	UK^{PPI}_t	UK^{PPI}_t	UK^{PPI}_t
Time FE	Yes	Yes	Yes	Yes	Yes
Weighted	Equal	Equal	Equal	Equal	Equal
Δt	1-year	2-year	3-year	4-year	6-year
Period	1848-60	1848-60	1848-60	1848-60	1848-60

Notes: Dependent variable is annualized log change in industry imports from 1848-1860. ΔRP_{it} is the *pseudo* change in realized protection induced by the changing price levels in the presence of the specific tariffs specified by the yet to be enacted Morrill Tariff of 1861 – given by equation 6. Annualized changes in price levels are based on the aggregate UK PPI. Columns differ in duration of changes and number of panels. Standard errors clustered at 2-Digit SITC level and reported in parenthesis. *, **, *** indicate $p < .1$, $p < .05$, $p < .01$ respectively.

Making full use of the 12-year sample, in Table 6 we estimate this model using one-, two-, three-, four-, and six-year changes in log industry imports and the analogous changes in realized protection. Standard errors are clustered at the 2-digit SITC level and all variables are annualized to facilitate comparison with previous tables. Across all specifications, the point estimate of interest is never significantly negatively related to import growth. If anything, the relationship seems to exhibit the opposite pattern, though not robustly so. That is, specific tariffs govern the response of trade flows after they are implemented, but not before.[39]

4.2 Specific Tariff Shares and Expected Inflation

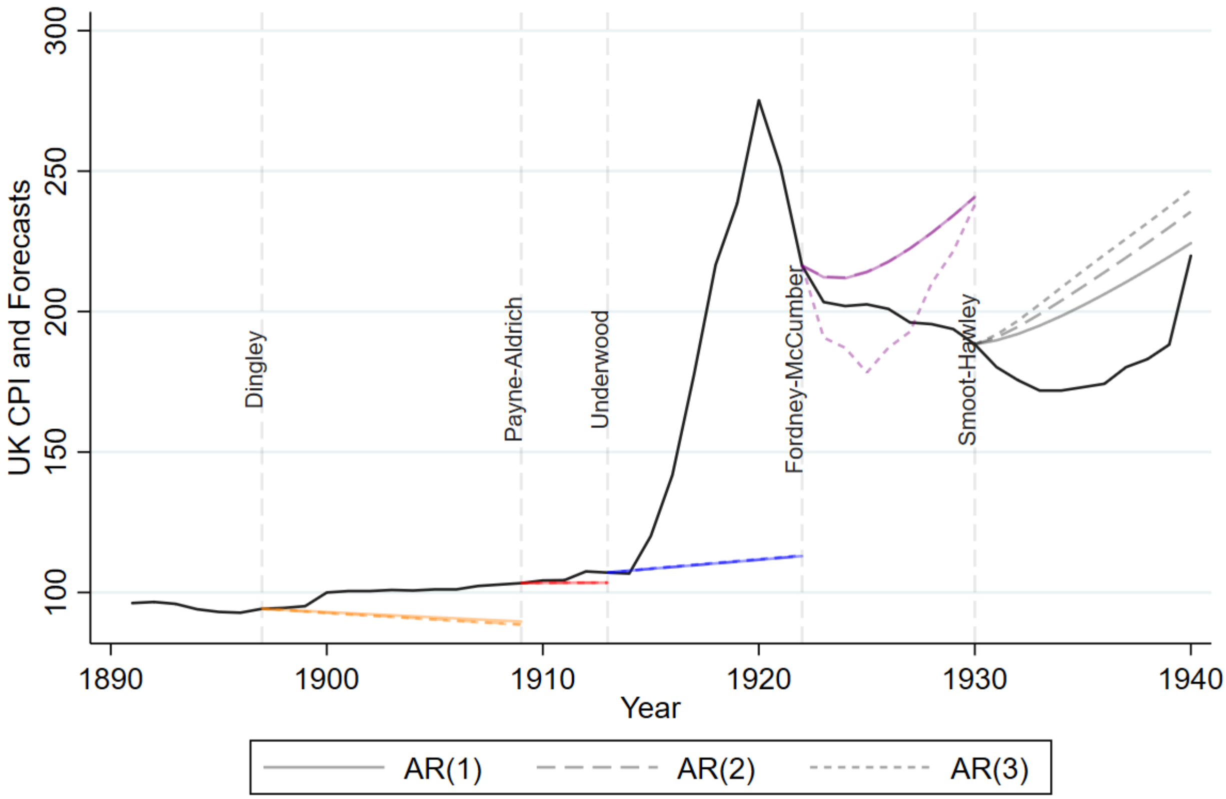
A final threat to identification is the possibility that changes in realized protection are themselves non-random. This would be possible if specific tariffs were determined jointly with an inflation forecast. That is, if politicians anticipate subsequent price movements and set specific tariffs in expectation of the implied effects on realized protection, our measure would be subject to the same concerns that complicate the use of ad valorem equivalent tariffs directly. For example, in the face of expected deflation, politically influential industries might lobby for higher levels of specific tariffs. We take two steps to explore this possibility. First, we evaluate the feasibility of price forecasting during our sample. Second, we evaluate whether industry-specific tariff shares do in fact change in anticipation of price movements.

We begin with a simple exercise to demonstrate the difficulty inherent in price forecasting during our sample. Prices in this era experienced periods of rapid inflation, as well as bouts of substantial deflation, as highlighted in Figure 1 above. To accurately set specific tariffs, politicians would need to correctly anticipate both. To further emphasize this point, we explore how well a simple price forecast matches subsequent price growth in this period. Specifically, in Figure 5 we present forecasts of the UK CPI, as used in our baseline measure of changes in realized protection, at the onset of each new tariff regime. We estimate an auto-regressive model of log price growth based on 25 years of data prior to each change in tariff policy. We use estimates from these models to construct a dynamic forecast beginning at the onset of the policy regime and continuing through the subsequent policy regime's inception. We report forecasts from models estimated using one to three lags.[40] As is clear from the figure, differences between the expected and realized price growth are considerable and represent likely unanticipated changes in realized protection. Take, for example, price forecasts at the onset of the Dingley Tariff in 1897. Forecasts would have predicted subsequent deflation, thus favoring specific tariffs as a tool to engender increased protection. In

[39] We have also estimated this specification dropping changes spanning the Canadian-American Reciprocity Treaty of 1854, as well as omitting years following the financial crisis of 1857. Neither modification impacts this null result.

[40] We could of course construct a more sophisticated model to forecast price growth, but conduct this exercise as a means to underscore the deviation from simple forecasts, which likely represent the upper limit of politicians' abilities in this period.

Figure 5: UK CPI Forecasts at Policy Onset



Notes: Forecast series constructed from AR(1), AR(2), and AR(3) models of log UK CPI growth respectively and are based on years (t_{-25}, t_{-1}) preceding the policy's onset at year t. UK CPI data taken from Jordà et al. (2017).

fact, prices increased. Even in cases when a simple forecast correctly predicts the direction of price changes, such as under the Underwood Tariff, the discrepancy between the magnitude of anticipated and realized price movements is substantial. Such volatility limits the scope for endogenous tariff setting through specific tariffs, as unanticipated changes in price levels lead directly to unanticipated changes in protection.

A separate but related point is that, to the extent that specific tariffs are employed endogenously as a policy tool, we would expect specific tariff shares to vary substantially over time as both prices and political economy concerns fluctuate. Furthermore, we would anticipate a negative correlation between industry specific tariff shares during periods of price increases and periods of price declines, as politicians hoping to protect domestic industry would rely on specific tariffs when facing deflation, and ad valorem tariffs when anticipating inflation. However, this is empirically not the case. In

Table 7 we present pairwise correlations between industry-level STS across all trade policy regimes in our sample. Specific tariff shares are highly and positively correlated throughout.

Table 7: Cross Policy Correlation in Industry Specific Tariff Shares

	Dingley	Payne-Aldrich	Underwood	Fordney-McCumber	Smoot-Hawley	Morrill
Dingley	1.000					
Payne-Aldrich	0.950***	1.000				
Underwood	0.504***	0.592***	1.000			
Fordney-McCumber	0.795***	0.824***	0.664***	1.000		
Smoot-Hawley	0.771***	0.786***	0.694***	0.945***	1.000	
Morrill	0.572***	0.632***	0.495***	0.665***	0.636***	1.000

Notes: Table reports pairwise correlations of industry-level specific tariff shares across policies. Specific tariff shares calculated as the share of duties among products with a specific tariff relative to total industry duties within an industry and reflect the first time a policy is implemented in our sample. Data are digitized from the Foreign Commerce and Navigation of the United States from 1900-1930 quinquennially to cover the primary five policy regimes, and in 1861 to obtain tariffs under the Morrill Tariff. Standard errors clustered at 2-Digit SITC level and reported in parenthesis. *, **, *** indicate $p < .1$, $p < .05$, $p < .01$ respectively.

Indeed, persistence in specific tariff shares extends back to the Morrill Tariff, 70 years prior to Smoot-Hawley. Industry-level specific tariff shares under the Morrill Tariff have a correlation exceeding 49.5% for all of our contemporary policy regimes. Motivated by this finding, in Table 8 we re-estimate our baseline industry-level specifications from Table 3, instrumenting for changes in realized protection with an analogous measure using Morrill Tariff specific tariff shares.[41] This exploits changes in tariff levels driven by contemporaneous price growth interacted with industry specific tariff shares set, at a minimum, 40 years prior.

As before, changes in realized protection are negatively related to changes in import growth. The point estimates are, if anything, larger in magnitude and exhibit the same pattern as those using contemporaneous specific tariff shares. In columns 1-3, our instrumented change in realized protection is negative and significant at the 5% level. Across all three columns, a one standard deviation increase in realized protection leads to approximately a 0.6 standard deviation decline in import growth. In columns 4-7, based on industry-level price variation, estimates remain negative

[41] Note that the number of observations differ slightly from those in Table 3. This is due to the smaller number of industries found in the 1861 import and tariff data. We observe no imports for SITCs 08, 22, 33, 57, and 82 in these data.

Table 8: US Import Growth and *Instrumented* ΔRP_{it}^{US}

	$\Delta Ln\left(Imports_{it}^{US}\right)$						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$\widehat{\Delta RP}_{it}$	-1.210**	-1.229**	-1.398**	-0.503	-0.527*	-0.526*	-0.652
	(0.533)	(0.544)	(0.560)	(0.297)	(0.308)	(0.304)	(0.403)
AVE_{it_0}		-0.038	-0.038		-0.039	-0.039	-0.039
		(0.025)	(0.026)		(0.024)	(0.024)	(0.024)
$STS_i^{Morrill}$			-0.013			0.001	0.001
			(0.011)			(0.011)	(0.011)
$\Delta Ln(P_{it})$							-0.154
							(0.198)
Standardized Coef.	-.619	-.628	-.715	-.421	-.441	-.44	-.546
R^2	0.403	0.410	0.405	0.376	0.384	0.378	0.375
MP Effective - F	28.89	28.81	29.74	83.987	83.328	82.592	29.407
Obs.	115	115	115	115	115	115	115
Price Growth	UK_t^{CPI}	UK_t^{CPI}	UK_t^{CPI}	UK_{it}^{UV}	UK_{it}^{UV}	UK_{it}^{UV}	UK_{it}^{UV}
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Weighted	Equal	Equal	Equal	Equal	Equal	Equal	Equal
Δt	10-year	10-year	10-year	10-year	10-year	10-year	10-year
Period	1900-40	1900-40	1900-40	1900-40	1900-40	1900-40	1900-40

Notes: Dependent variable is annualized ten-year change in log US real industry imports. $\widehat{\Delta RP}_{it}$ is change in realized protection which is the US industry specific tariff share times the negative price growth instrumented with the industry specific tariff share under the Morrill Tariff of 1861 interacted with negative price growth. Annualized log changes in price levels are derived from aggregate UK CPI in column 1-3 and UK industry import unit values in columns 4-7. Standard errors clustered at 2-Digit SITC level and reported in parenthesis. *, **, *** indicate $p < .1$, $p < .05$, $p < .01$ respectively. MP Effective - F is the first stage effective F-statistic with small-sample correction detailed in Montiel Olea and Pflueger (2013).

but are slightly noisier. As a whole, these results suggest that time-varying political economy concerns do not play a dominant role in determining specific tariff shares or their relationship with subsequent import growth. Path dependence in policy setting implies that tariffs in the early 20^{th} century are highly correlated with those set before the Civil War. Further, price volatility during this era made accurate forecasts of inflation, a necessary component of a targeted specific tariff policy, difficult to obtain.

5 Local Effects of Import Exposure

Having established the importance of specific tariffs in shaping import competition across industries, we now turn to the local level. In particular, we explore the role played by imports in the transition into manufacturing and services and away from agriculture, using our measure of realized protection as an instrument. The late 19^{th} and early 20^{th} century was a period of rapid industrialization in the US (Irwin, 2003). As our approach yields a consistent measure of import exposure across the entire era, it allows us to shed light the role of trade in structural change of the American economy.

We begin by documenting the explanatory power of realized protection over a weighted average of industry-level imports at the county level. We aggregate industry-level exposure to the county level using data from the full count decennial Census (Ruggles et al., 2020).[42] To facilitate a mapping between trade flows and employment levels, we first concord the SITC industry classifications described above to Census industries.[43] For each county c, we then calculate a weighted average of industry-level imports per worker at the beginning and end of each decade in our sample, using start-of-decade labor shares as weights.[44] Finally, we take the decadal difference of log imports per worker within each county. Our county-level measure of import exposure is thus:

$$\Delta Ln(IPW_{ct}) = \Delta Ln\left(\sum_i \frac{L_{ict_0}}{L_{ct_0}} \frac{Imports_{it}}{L_{it_0}}\right) \tag{7}$$

Here, $\frac{Imports_{it}}{L_{it_0}}$ represents national imports per worker, using imports at time t and national industry employment at the start of the decade. This is weighted by $\frac{L_{ict_0}}{L_{ct_0}}$, the start-of-decade industry employment share in county c.[45]

Similarly, we construct a county-level measure of changes in realized tariff protection, weighting industry realized protection by each industry's start-of-decade labor share within the county. We employ our aggregate UK CPI-based measure of changes in prices, yielding

$$\Delta RP_{ct} = -\Delta Ln(p_t) \sum_i \frac{L_{ict_0}}{L_{ct_0}} STS_{it_0}, \tag{8}$$

We control for the start-of-period AVE_{ct_0} and STS_{ct_0} with a similarly constructed county-specific employment-weighted average of industry-level AVE_{it_0} and STS_{it_0} .

Figure 6 displays the geographic distribution of specific tariff shares at the county level in each decade. As is clear from the figure, the variation across industries described above begets variation

[42] Labor force participation is not available in the 1900 full count data. As a result, we use the 5% sample for 1900.

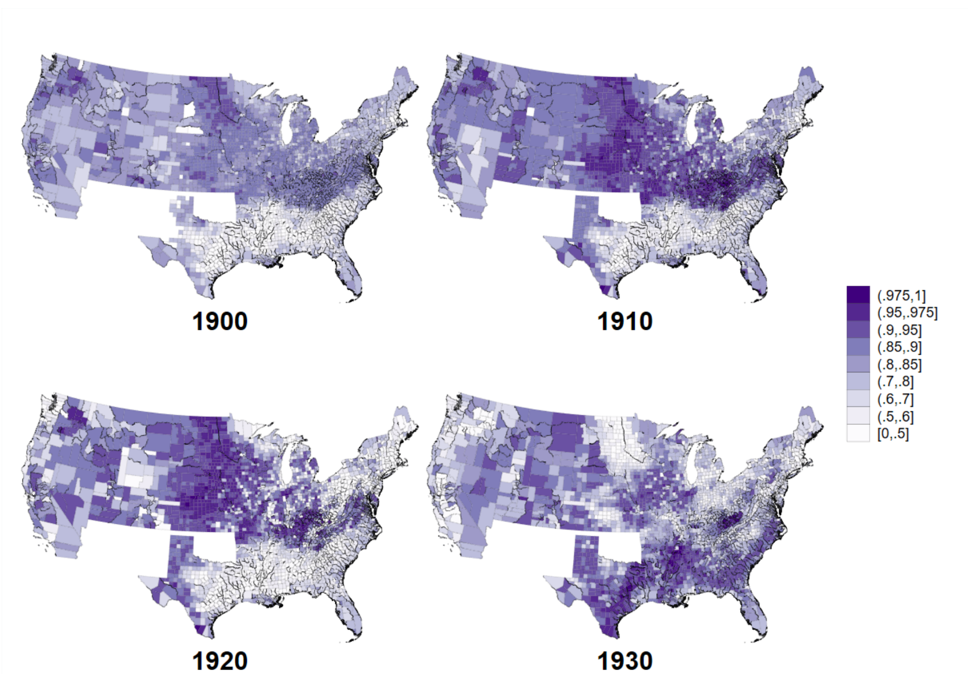
[43] Specifically, we map all counties to consistent geographic 1900 boundaries using the crosswalk created by Eckert et al. (2020). We then construct population weights based on the IND1990 variable in the IPUMS data.

[44] We restrict our sample to men ages 20-65.

[45] This is calculated using employment in tradable sectors only. This effectively assumes that trade shocks pass through to non-tradable industries, as in Kovak (2013).

across regions. The prevalence of specific tariffs in certain agriculture and food products as well as mining, for instance, leads to reductions in protection for the Upper South, Great Plains, and Upper Midwest in he first half of our sample. Cotton, however, is duty free at the beginning of our sample, implying very little exposure to price changes for much of the Deep South. Sharp declines in prices between 1920 and 1930, then, imply increased protection in much of the West and Appalachia, but not in the South. By 1930, reliance on specific tariffs has expanded more broadly throughout the South and Gulf Coast, and we thus see a more mixed geographical distribution.

Figure 6: Start of Decade County STS_{ct}



Notes: Maps of start of Decade county specific tariff shares. Omitted counties lack data on agricultural output required to construct this measure for agricultural sectors. County boundaries are mapped to consistent county boundaries over time following Eckert et al. (2020).

In Table 9 we document the relationship between decadal changes in realized protection and our measure of county exposure to import growth. Regressions are weighted by county population with standard errors clustered at the state level. In column 1 we include only decade fixed effects. As with our industry specifications, the relationship is negative and statistically significant: changing price levels lead to shifts in protection and, as a result, differential exposure to average import growth at the county level. By way of interpretation, consider a one-standard deviation increase in a county's realized protection – approximately a 33% increase. This corresponds to a 16% increase in import growth – roughly 38% of a standard deviation in the dependent variable.[46]

Table 9: Changes in Log Imports Per Worker versus ΔRP_{ct}

	1900-1940	1900-1940	1900-1940	1900-1940	Omitting 1900-1910	Omitting 1910-1920	Omitting 1920-1930	Omitting 1930-1940
ΔRP_{ct}	-0.492***	-0.502***	-0.524***	-0.525***	-0.520***	-0.839***	-0.345***	-0.510***
	(0.065)	(0.062)	(0.059)	(0.060)	(0.060)	(0.097)	(0.077)	(0.058)
AVE_{ct_0}		-0.273***	-0.368***	-0.423***	-0.338***	-0.614***	-0.350***	-0.523***
		(0.087)	(0.097)	(0.097)	(0.103)	(0.171)	(0.079)	(0.086)
STS_{ct_0}			-0.115***	-0.108***	-0.120***	-0.005	-0.044	-0.144***
			(0.033)	(0.036)	(0.043)	(0.038)	(0.046)	(0.037)
Obs.	11,059	11,059	11,059	11,059	8,313	8,288	8,288	8,288
R^2	0.858	0.859	0.863	0.864	0.836	0.852	0.823	0.885
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Region FE	N	N	N	Y	Y	Y	Y	Y

Notes: County-level regressions of changes in log imports per worker against changes in realized protection from 1900-1910, 1910-1920, 1920-1930, 1930-1940. Data from *Statistical Abstract of the United States* and *Foreign Commerce and Navigation of the United States* and author's calculations. AVE, STS measured at the start of decade. Standard errors are clustered at the state level and reported in parenthesis. *, **, *** indicate $p < .1$, $p < .05$, $p < .01$ respectively.

In columns 2 and 3 we sequentially add controls for the start-of-decade AVE_{ct_0} and STS_{ct_0}. The coefficient of interest increases slightly and remains statistically significant. We note that AVE_{ct_0} is negatively correlated with subsequent import growth, again consistent with the notion that higher tariff levels restrict subsequent import growth. Unlike our industry analysis, STS is strongly negatively correlated to county log import growth independent of its effect on imports through price deflation. In column 4 we introduce Census region fixed effects to control for persistent regional differences in import growth that might correlate with tariff exposure at the local level. This leaves our results unaltered.

A primary concern for our analysis is the effect of large, idiosyncratic events such as World War I and the Great Depression. To ensure that the relationship documented in the table is not driven exclusively by outlier events, in columns 5 through 8 we repeat the specification from column 4, sequentially omitting one decade in each column. While omitting the War years or the 1920s alters the magnitude of the point estimates somewhat, they remain negative and statistically significant across all columns – the relationship between realized protection and average imports at the county level is not driven by by any specific decade.[47]

[46] Summary statistics for these variables may be found in Appendix Table D1.

[47] The estimates imply that a one standard deviation increase in realized protection reduces import growth by 0.45, 0.31, 0.32, and 0.41 standard deviations, respectively, in columns 5 through 8.

5.1 Import Growth and Labor Market Outcomes

We now turn to the effect of trade on local labor markets. Under this approach, we regress local outcomes against changes in the log of county average imports per worker, $\Delta Ln(IPW)_{ct}$, for each decade t between 1900 and 1940, instrumenting with ΔRP_{ct}:

$$\Delta Outcome_{ct} = \beta_0 + \beta_1 \Delta Ln(\widehat{IPW_{ct}}) + \beta_2 X_{ct} + \gamma_t + \epsilon_{ct} \tag{9}$$

Here, X_{ct} represents a set of start-of-decade controls for county characteristics that may otherwise contaminate our estimates. As above, all specifications are weighted by county population, with standard errors clustered at the state level.

We begin by exploring labor force attachment. In Table 10 we regress decadal changes in labor force to population ratios for men ages 20-65 against $\Delta Ln(\widehat{IPW_{ct}})$.[48] Column 1 includes only our measure of interest and decade fixed effects. The results in the column indicate that increased import competition reduces county labor market attachment. Specifically, increasing a county's log import growth by one standard deviation corresponds to a 3 percentage point reduction in the labor force participation growth rate. This result is unchanged by the inclusion of AVE_{ct_0} in column 2 or STS_{ct_0} in column 3.

As discussed above, the Upper South, Upper Midwest, and Great Plains regions exhibit large shifts in realized protection due to greater reliance on specific tariffs in agriculture and mining. This regional variation corresponds closely to cross-sectional variation in agricultural and manufacturing employment, with the Southern and Plains regions focused primarily on agriculture, while manufacturing clusters in the North.[49] If industries respond differentially to price shocks for reasons other than differences in the nature of tariffs, then estimates that don't account for this regional variation may be biased. We take several steps to address this concern.

First, in column 4 we control separately for the start-of-decade county share of labor in agricultural production and in manufacturing.[50] Since we are running a first-difference specification, this

[48] Due to the low share of women in the labor force during this period, we focus exclusively on male outcomes.

[49] The distribution of agriculture and manufacturing employment as of 1900 can be seen in Appendix Figure **??**.

[50] Specifically, agricultural production corresponds to 1990 IPUMS Census industries 010 and 011, while manufacturing corresponds to industries 100-392.

Table 10: Changes in Labor Force Participation

	(1)	(2)	(3)	(4)	(5)
$\Delta Ln(\widehat{IPW_{ct}})$	-0.072***	-0.072***	-0.073***	-0.074***	-0.075***
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
AVE_{ct_0}		-0.004	-0.002	-0.006	0.002
		(0.012)	(0.012)	(0.016)	(0.018)
STS_{ct_0}			0.003	0.006	0.005
			(0.003)	(0.005)	(0.005)
% Manufacturing$_{ct_0}$				0.024**	0.026**
				(0.012)	(0.012)
% Farm$_{ct_0}$				0.001	-0.003
				(0.004)	(0.004)
% Literate$_{ct_0}$				-0.027	-0.050
				(0.029)	(0.037)
% Foreign Born$_{ct_0}$				-0.009*	-0.009
				(0.005)	(0.007)
% Non-White$_{ct_0}$				-0.016	-0.017*
				(0.010)	(0.010)
% Under 35$_{ct_0}$				-0.002	-0.012
				(0.014)	(0.018)
Obs.	11,056	11,056	11,056	11,056	11,056
R^2	0.256	0.256	0.255	0.257	0.258
1^{st} Stage F-stat	57.655	65.814	79.274	71.442	68.571
Year FE	Y	Y	Y	Y	Y
Region FE	N	N	N	N	Y

Notes: Dependent variable is change in log labor force to population ratios among men ages 20-65 at the county level from 1900-1910, 1910-1920, 1920-1930, 1930-1940. Import data from *Statistical Abstract of the United States* and *Foreign Commerce and Navigation of the United States* and author's calculations. Population data from IPUMS Ruggles et al. (2020). Unless otherwise indicated data controls are measured at start of decade. Import growth is instrumented by $\Delta RP_{ct,t+1}$ as equation 8. Regressions weighted by start of period population. Standard errors are clustered at the state level. *, **, *** indicate $p < .1$, $p < .05$, $p < .01$ respectively.

controls for agricultural and manufacturing trends throughout our sample. Second, we introduce a number of county-specific, start-of-decade measures intended to control for differential trends in labor market outcomes as a function of local characteristics. These controls include the share of the population that is literate, the share of the population that is foreign born, the share of the population that is non-white, and the share of the population that is under age 35. Inclusion of these controls increases the magnitude of the point estimate slightly, but leaves our primary finding unchanged. Finally, in column 5 we directly control for persistent differential labor market trajectories across geographic areas via Census region fixed effects. Similar in spirit to the farm and manufacturing controls in column 4, this addresses the concern that our results might be driven by variation in broader, regionally clustered sectoral trends to economic shocks. Our results are unaffected by this addition.

Table 11: Changes in Labor Force Participation Robustness

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\Delta Ln(\widehat{IPW_{ct}})$	-0.079***				-0.075***	-0.085***	-0.045*	-0.071***
	(0.021)				(0.015)	(0.021)	(0.023)	(0.015)
$\Delta Ln(\widehat{IPW_{ct}^{UK_{it}}})$		-0.061***						
		(0.013)						
$\Delta Ln(\widehat{IPW_{ct}})$ $\times North$			-0.074***					
			(0.016)					
$\Delta Ln(\widehat{IPW_{ct}})$ $\times South$			-0.072***					
			(0.011)					
$\Delta Ln(\widehat{IPW_{ct}})$ $\times Plains$				-0.072***				
				(0.015)				
$\Delta Ln(\widehat{IPW_{ct}})$ $\times Non-Plains$				-0.091***				
				(0.023)				
Obs.	11,056	11,056	11,056	11,056	8,312	8,286	8,285	8,285
R^2	0.25	0.28	0.26	0.23	0.27	0.29	0.42	0.05
1^{st} Stage F-stat	52.875	52.549	33.242	30.467	65.004	120.337	18.688	71.183
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Region FE	N	N	N	N	Y	Y	Y	Y

Notes: Dependent variable is change in labor force to population among men ages 16-64 at the county level from 1900-1910, 1910-1920, 1920-1930, 1930-1940. Import data from *Statistical Abstract of the United States* and *Foreign Commerce and Navigation of the United States* and author's calculations. Population data from IPUMS Ruggles et al. (2020). Unless otherwise indicated data controls are measured at start of decade. Import growth is instrumented by $\Delta RP_{ct,t+1}$ as equation 8. Regressions weighted by start of period population. Standard errors clustered at the state level. *, **, *** indicate $p < .1$, $p < .05$, $p < .01$ respectively.

These results suggest that import competition reduces labor force attachment. In Table 11, we consider a number of robustness tests of this baseline result. In each column, we replicate column 5 of Table 10 with a single modification. In column 1, rather than exploiting start-of-decade tariff policy, we construct our measure of exposure using tariff rates and specific tariff shares midway through the decade. This accounts for the fact that tariff policy changes during each decade in our sample.[51] This increases the point estimate slightly but leaves it qualitatively unchanged and statistically significant. In column 2 we exploit industry variation in price growth using UK import unit values as in Section 4 above. Specifically, we reconstruct equation 8 using changes in UK

[51]Specifically, the Dingley Tariff was replaced by the Payne-Aldrich Tariff in 1909, which was replaced by the Underwood-Simmons Tariff in 1913, replaced by the Fordney-McCumber Tariff in 1922. Thus, for 1900-1910, we use tariffs as of 1905, for 1910-1920 we use 1915, and for 1920-1930 we use 1925. As Smoot-Hawley remains in place for the entirety of the 1930s, we continue to use 1930 for the 1930-1940 period.

industry unit values. We also include but suppress the direct effect of price changes. The point estimate of interest is reduced slightly but remains statistically significant. The point estimate in this column implies that a standard deviation increase in import exposure reduces the county labor force to population ratio by 0.026.

As discussed above, one might be concerned that the relationship between realized protection and imports is driven by unobservable industry differences. Given the regional clustering of industries, if such unobservables were the primary driver of our results, we would expect significantly different responses to trade across regions. To explore this possibility, in columns 3 and 4 we allow for differential effects by geographic region. In column 3 we group counties into the North and South, while in the column 4 we group counties into the Plains region and non-Plains region.[52] While point estimates are slightly larger for the non-Plains region in particular, estimates are statistically significant and large in each region separately. That is, our results are not driven by particular geographical subsets of the country.

Finally, in our remaining four columns, we sequentially drop each decade in the sample to further demonstrate that neither heterogeneous exposure to World War I nor the Great Depression drive our results. Our key finding obtains across all columns: increased import exposure, driven by inflation combined with specific tariffs, leads to relative reductions in local labor force participation.

5.2 Import Competition and Structural Adjustment

Leaving the labor force entirely is only one potential response to import competition. Indeed, given the lack of a broad social safety net prior the onset of the Great Depression, this may not be the primary margin of adjustment during our sample. Notably, the first decades of the 20^{th} century US involved the expansion of the manufacturing and service sectors and the transition away from agriculture for broad swathes of the population (Michaels et al., 2012; Eckert and Peters, 2018; Fiszbein, 2022). We now explore the role of trade in this process by considering shifts across industries. In Table 12, we decompose labor force participation into shifts across mutually exclusive sectors. We divide by the total population, such that the omitted category is individuals not in the

[52] "South" corresponds to the following Census regions: South Atlantic, East South Central, and West South Central. "Plains" corresponds to West South Central and West North Central Regions.

labor force. The set of covariates is identical to that of column 5 from Table 10, though for brevity we report only the coefficients from import growth, AVE_{ct_0}, and STS_{ct_0}.

Table 12: Changes in Sectoral Employment

	Tradables				Non-Tradables			
	Ag.	Manuf.	Mining	Construction	Transport	Wholesale Retail	Finance Service	Other
$\Delta Ln(\widehat{IPW_{ct}})$	0.054***	-0.142***	-0.012	0.066***	-0.025***	0.019**	0.041***	-0.076*
	(0.020)	(0.022)	(0.009)	(0.014)	(0.009)	(0.008)	(0.010)	(0.045)
AVE_{ct_0}	-0.047**	-0.156***	0.074***	0.012	-0.028***	-0.046***	0.029***	0.165***
	(0.024)	(0.030)	(0.024)	(0.019)	(0.006)	(0.014)	(0.010)	(0.051)
STS_{ct_0}	-0.014**	-0.036***	-0.004	0.017***	-0.005**	-0.019***	-0.009***	0.075***
	(0.007)	(0.011)	(0.005)	(0.005)	(0.002)	(0.005)	(0.003)	(0.015)
Obs.	11,056	11,056	11,056	11,056	11,056	11,056	11,056	11,056
R^2	0.37	0.42	0.05	0.57	0.07	0.75	0.64	0.83
1^{st} Stage F-stat	68.57	68.57	68.57	68.57	68.57	68.57	68.57	68.57
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Region FE	Y	Y	Y	Y	Y	Y	Y	Y

Notes: Dependent variable is change in share of employment accounted for by different industries among men ages 16-64 at the county level from 1900-1910, 1910-1920, 1920-1930, 1930-1940. Import data from *Statistical Abstract of the United States* and *Foreign Commerce and Navigation of the United States* and author's calculations. Population data from IPUMS Ruggles et al. (2020). Unless otherwise indicated data controls are measured at start of decade. Import growth is instrumented by ΔRP_{ct} as equation 8. Regressions weighted by start of period population. We include but suppress the share of county employment in tradable industries interacted with a time dummy variable in all specifications. Standard errors clustered at the state level. *, **, *** indicate $p < .1$, $p < .05$, $p < .01$ respectively.

The results suggest a somewhat nuanced response to trade. Import competition leads to a movement away from manufacturing and, to a lesser extent, transportation and miscellaneous categories. Employment declines in these industries were offset to some extent by increased employment in agriculture and non-tradable industries: construction, retail, and financial services. It bears repeating that this specification exploits cross-county differences in realized protection *within* regions. Thus, these results cannot be explained by aggregate shocks that might differentially affect manufacturing- or agriculture-intensive regions throughout the sample. These results are consistent with the notion that import competition inhibited the shift towards manufacturing in this era. However, as noted by Broadberry (1998) and Irwin (2017), productivity growth in this era was largely driven by growing output in the higher productivity service sector.[53] To the extent that trade accelerated this transition, it may have played a role in increasing productivity. That is, import competition may have impeded structural adjustment along the manufacturing margin

[53]Consistent with this, the average occupational income score among individuals employed in agriculture in our sample is 12.45, while in manufacturing it is 25.46 and in services it is 28.91, suggesting that labor productivity was greatest in services.

while encouraging it along the service margin.

To further explore the role of trade played in structural adjustment in this era, in Table 13 we examine the differential consequences of imports for agricultural, manufacturing, and service employment among different demographic groups. Specifically, we replicate the specifications from columns 1, 2, and an aggregration of columns 3 through 7 of Table 12 for the following groups: 20-34 year-olds, 35-49-year olds, 50-65 year-olds, White, Black, foreign-born, urban, and rural.

Table 13: Changes in Employment by Demographic Group

	(1) 20-34	(2) 35-49	(3) 50-65	(4) White	(5) Black	(6) Foreign Born	(7) Urban	(8) Rural
	Panel A: ΔAg Share							
$\Delta Ln(\widehat{IPW_{ct}})$	0.105***	0.057***	-0.050**	0.054***	0.074*	0.027	0.048***	0.081**
	(0.024)	(0.021)	(0.023)	(0.019)	(0.042)	(0.021)	(0.012)	(0.035)
	Panel B: ΔMfg Share							
$\Delta Ln(\widehat{IPW_{ct}})$	-0.184***	-0.124***	-0.100***	-0.135***	-0.321***	-0.126***	-0.138***	-0.134***
	(0.028)	(0.019)	(0.018)	(0.023)	(0.048)	(0.026)	(0.021)	(0.028)
	Panel C: ΔService Share							
$\Delta Ln(\widehat{IPW_{ct}})$	0.050**	0.020	0.016	0.038*	0.208***	0.003	0.013	-0.007
	(0.020)	(0.026)	(0.022)	(0.022)	(0.071)	(0.023)	(0.026)	(0.024)
Obs.	11,055	11,052	11,045	11,056	8,956	9,981	5,548	10,943
1^{st} Stage F-stat	68.571	68.571	68.572	68.571	68.589	67.220	70.708	57.342

Notes: Dependent variable is change in share of employment accounted for by different industries among men ages 16-64 at the county level from 1900-1910, 1910-1920, 1920-1930, 1930-1940. Import data from *Statistical Abstract of the United States* and *Foreign Commerce and Navigation of the United States* and author's calculations. Population data from IPUMS Ruggles et al. (2020). Unless otherwise indicated data controls are measured at start of decade. Import growth is instrumented by ΔRP_{ct} as equation 8. Regressions weighted by start of period population. Standard errors clustered at the state level. *, **, *** indicate $p < .1$, $p < .05$, $p < .01$ respectively.

Several patterns emerge from the table. First, while the decline in manufacturing employment falls on all age groups, it is most pronounced among young, with a point estimate approximately 50% larger for the 20-34 year-old group than for the older age groups. This suggests import competition impeded entry into the manufacturing sector for those new to the labor force. Second, and similarly, the positive effect of import competition on agriculture and service sector employment is driven largely by the youngest group. Finally, the manufacturing effects fall on all demographic groups, though the foreign-born do not see increases in agricultural or service employment.

It thus seems that import competition played a role in governing structural change in the United

States during this era. To gain a sense of magnitude of the effect, note that the standard deviation of $\Delta Ln(IPW_{ct})$ over the entirety of our sample is approximately 0.27. The point estimate from the second column of Table 12 thus implies that a standard deviation increase in import competition corresponds to a reduction in the share of the population employed in manufacturing over 40 years of approximately 0.038. This is equal to approximately half of the standard deviation of the 40-year change in the manufacturing employment to population ratio. The analogous increase in construction, retail and financial services is nearly the same size. One of import competition's primary effects was on labor market churn: individuals shifted away from manufacturing and into agriculture and services, particularly the young.

6 Conclusion

In this paper we develop a novel approach to measuring exposure to import competition. By interacting price changes with cross-industry variation in the prevalence of specific tariffs, we construct a measure of tariff exposure at the industry and county level that varies substantially over time even in the absence of changes to policy. We show that our measure predicts import growth at both the industry and county levels and predicts subsequent county-level labor market outcomes. Labor force participation declines in response to import competition, and manufacturing employment growth is replaced by growth in agriculture and services, particularly among the young. This provides the first evidence of the spatial effects of trade on labor from 1900-1940 and proposes a methodological approach to mitigate concerns related to endogenous protection.

We are currently pursuing several extensions of this approach. First, we intend to take advantage of the availability of linked Census data during this period to explore the response to import exposure at the individual level over the very long run. As a part of this, we hope to explore the inter-generational effect of trade shocks by linking sons to their fathers. Second, we are currently exploring the effect of exogenous variation in trade exposure on Congressional voting on trade bills in the early 20^{th} century. This is a particularly attractive possibility given the ability of our measure to avoid standard concerns related to the endogeneity of trade policy. Finally, we hope to expand our approach to modern data, taking advantage of more complete micro data to explore the response to exogenous trade variation in the absence of major policy shifts.

We believe this is a small set of the potential applications for this approach. Numerous economies beyond the early 20^{th} century US employ specific tariffs. Even within the US, the inflationary effects of trade shocks are exploitable well beyond the 1940s, as specific tariffs were fixed in 1930 and have since remained unaltered in the US Column 2 rates. Finally, this period is a particularly rich policy environment in which to explore the relationship between trade and a variety of government activities. The ability of governments to ameliorate the negative consequences of trade is of first order importance for trade economists. Policy shifts in this period on matters of unionization, voting rights, educational standards, and the social safety net provide the sort of empirical variation that economists require to explore this important topic. The method proposed here thus provides an opportunity to explore not merely trade shocks, but also the accompanying effects of a rich set of coincident policy interventions.

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Appendices

This appendix provides additional information about our primary analysis and is broken into four sections. In section A we detail industry definitions and aggregation for all our analysis. Section B describes data sources and outlines the mapping between the raw data and industry-level variables. This section is divided by country and period as follows: US tariff and import data sources from 1900-1940 are detailed in section B.1; US tariff and import data sources from 1848-1861 are detailed in section B.2; UK import data and industry price growth construction are detailed in section B.3.

In section C we provide additional information regarding our industry import data and explore robustness of our primary industry results to changes in sample and alternate measures of realized protection. Finally, in section D we provide additional information regarding our labor market analysis.

A Industry Classification

The majority of our sample pre-dates a formal statistical classification, with products identified solely by their names. To ensure a consistent mapping across all four of our databases (US tariffs 1900-1930, US imports 1900-1940, UK imports 1900-1938, and US imports 1848-1861) we concord all tariff and import lines to a consistent set of industries based on the two-digit SITC revision 2 classification, which allows us to cover over 95% of all US import value during this period. Due to differences in the level of aggregation provided in the various data sources, we aggregate SITC-2 industries slightly. This process results in 34 two-digit industries. Table A1 presents the native 2-digit SITC code as well as the mapping to our more aggregate industry definitions. Immediately following this table we provide a detailed explanation for any modifications to the original SITC-2 industries. Column 1 reports the original two-digit code. Column 2 provides the two-digit description. Column 3 indicates our industry assignment of these codes, and column 4 provides a description of the resulting industry group.

Table A1: Aggregation of SITC-2 Industries

SITC-2	SITC Revision 2 2-digit Description	Industry	Short Description
00	Live animals chiefly for food	00	Animals
94	Animals, live, nes, (including zoo animals, pets, insects, etc)	00	Animals
01	Meat and preparations	01	No Change
02	Dairy products and birds' eggs	02	No Change
03	Fish, crustacean and mollusks, and preparations thereof	03	No Change
04	Cereals and cereal preparations	04	No Change
05	Vegetables and fruit	05	No Change
06	Sugar, sugar preparations and honey	06	No Change
07	Coffee, tea, cocoa, spices, and manufactures thereof	07	No Change
08	Feeding stuff for animals (not including unmilled cereals)	08	No Change
09	Miscellaneous edible products and preparations	43*	Split
11	Beverages	†	** Dropped (Prohibition)
12	Tobacco and tobacco manufactures	12	No Change
21	Hides, skins and furskins, raw	21	No Change
22	Oil seeds and oleaginous fruit	22	No Change
23	Crude rubber (including synthetic and reclaimed)	23	No Change
26	Textile fibers (not wool tops) and their wastes (not in yarn)	26	No Change
28	Metalliferous ores and metal scrap	28	No Change
29	Crude animal and vegetable materials, nes	29	No Change
32	Coal, coke and briquettes	32	No Change
33	Petroleum, petroleum products and related materials	33	No Change
34	Gas, natural and manufactured	†	** Dropped (Not observed)
35	Electric current	35	Electric current
41	Animal oils and fats	43	Natural Oils
42	Fixed vegetable oils and fats	43	Natural Oils
43	Animal and vegetable oils and fats, processed, and waxes	43	Natural Oils
51	Organic chemicals	59	Chemicals a.m.o.
52	Inorganic chemicals	59	Chemicals a.m.o.
53	Dyeing, tanning and coloring materials	59	Chemicals a.m.o.
54	Medicinal and pharmaceutical products	59	Chemicals a.m.o.
58	Artificial resins and plastic materials, and cellulose esters etc	59	Chemicals a.m.o.
59	Chemical materials and products, nes	59	Chemicals a.m.o.
55	Oils and perfume materials; toilet and cleansing preparations	55	Chemicals a.m.o.
57	Explosives and pyrotechnic products	57	No Change
61	Leather, leather manufactures, nes, and dressed furskins	61	No Change
62	Rubber manufactures, nes	62	No Change
24	Cork and wood	63	Cork, Wood, a.m.o.
63	Cork and wood, cork manufactures	63	Cork, Wood, a.m.o.
25	Pulp and waste paper	64	Pulp, Paper, a.m.o.
64	Paper, paperboard, and articles of pulp, of paper or of paperboard	64	Pulp, Paper, a.m.o.
65	Textile yarn, fabrics, made-up articles, nes, and related products	65	No Change
27	Crude fertilizer and crude minerals	66	Non-metallic minerals, fertilizers, a.m.o.
56	Fertilizers, manufactured	66	Non-metallic minerals, fertilizers, a.m.o.
66	Non-metallic mineral manufactures, nes	66	Non-metallic minerals, fertilizers, a.m.o.
67	Iron and steel	69	Metals a.m.o.
68	Non-ferrous metals	69	Metals a.m.o.
69	Manufactures of metals, nes	69	Metals a.m.o.
71	Power generating machinery and equipment	77	Machinery
72	Machinery specialized for particular industries	77	Machinery
73	Metalworking machinery	77	Machinery
74	General industrial machinery and equipment, nes, and parts of, nes	77	Machinery
75	Office machines and automatic data processing equipment	77	Machinery
76	Telecommunications, sound recording and reproducing equipment	77	Machinery
77	Electric machinery, apparatus and appliances, nes, and parts, nes	77	Machinery
81	Sanitary, plumbing, heating, lighting fixtures and fittings, nes	77	Machinery
78	Road vehicles	79	Transportation Equipment
79	Other transport equipment	79	Transportation Equipment
82	Furniture and parts thereof	82	No Change
83	Travel goods, handbags and similar containers	61*, 89*, 63*	Split
84	Articles of apparel and clothing accessories	84	No Change
85	Footwear	62*, 61*	Split
87	Professional, scientific, controlling instruments, apparatus, nes	†	*Dropped (Uncategorizable)
88	Photographic equipment and supplies, optical goods; watches, etc	88	No Change
89	Miscellaneous manufactured articles, nes	†	*Dropped (Uncategorizable)
91	Postal packages not classified according to kind	†	*Dropped (Uncategorizable)
93	Special transactions, commodity not classified according to class	†	*Dropped (Uncategorizable)
95	Armored fighting vehicles, war firearms, ammunition, parts, nes	57*, 79*	Split
96	Coin (other than gold coin), not being legal tender	†	* Dropped (Gold Standard)
97	Gold, non-monetary (excluding gold ores and concentrates)	†	* Dropped (Gold Standard)

Animals (SITC 00 & SITC 94): The UK samples separate edible animals from animals for uses other than human consumption inconsistently within decades. In order to construct industry price growth measures, we require a consistent definition of products. Consequently, we map all to a combined animals category.

Miscellaneous Edible (SITC 09): This is comprised solely of ”vinegar” and “lard”, which appear intermittently throughout the sample. We remap lard to animal fats and oils and drop the remaining vinegar observations, as they appear in a small number of years.

Beverages (SITC 11): This category is almost wholly comprised of alcohol in most years. In 1920, Prohibition in the United States made imports illegal until its repeal 1933. Including this category would result in spurious changes in import growth during our sample that are unrelated to realized protection and confound all but the 1900-1910 cross-section. As a result, we drop SITC 11 from our import data.

Gas, Natural and Manufactured (SITC 34): This category is only observed in 1900 and 1905 in the FCNUS tariff data, making calculation of the effects of changes in import growth over our sample infeasible. We drop these observations.

Natural Oils (SITC 41-43): We combine Animal oils and fats (41), Fixed vegetable oils and fats (42) and Animal and vegetable oils and fats, processed, and waxes (43) due to changing aggregation over time that may otherwise cause elements of 41 and 42 to be categorized in 43.

Chemicals and manufactures of (SITCs 51-54, 58, & 59): We aggregate Organic chemicals (51), Inorganic chemicals (52), Dyeing, tanning and coloring materials (53), Medicinal and pharmaceutical products (54) and Artificial plastic materials, n.e.s. (58), Chemical materials and products, nes (59). 51 and 52 have substantial overlap with 53 and 54, especially as product use over time changes. Chemicals may be used both as a dyeing agent and for medicinal or cosmetic purposes, making consistent distinctions difficult or impossible to make. In some years these chemicals are specified by end use, and others not. Consequently, we construct a single chemicals industry group.

Cork, Wood, and manufactures of (SITCs 24 & 63): This combines cork and wood with cork and wood manufactures. US and UK differ in the extent to which they distinguish these two different groups, and aggregation changes over time.

Pulp, Paper and manufactures of (SITCs 25 & 64): This combines Pulp and waste paper (25) with Paper, paperboard, and articles of pulp, of paper or of paperboard (64). Ambiguity over time regarding waste paper and articles of pulp, for example, make it difficult to separate these categories fully.

Non-metallic minerals, fertilizers, and manufactures of (SITCs 27, 56, & 66): We combine Crude fertilizer and crude minerals (27), Fertilizers, manufactured (56), and Non-metallic mineral manufactures (66). There is substantial overlap between unprocessed and manufactured fertilizers as well as the minerals used in their production.

Metals and manufactures of (SITC 67- 69): We combine Iron and steel (67), Non-ferrous metals (68), and Manufactures of metals, nes (69). Difficulties in distinguishing iron and steel manufactures used as inputs (67) from finished manufactures of metals (69) requires that we aggregate these categories.

Machinery (SITC 71-77): This category contains all machinery with the exception of road vehicles and transportation equipment. The SITC categories disaggretate by industry use, while this level of disaggregation is not always clear in the tariff data, particularly early in the sample.

Transportation Equipment (SITC 78 & 79): This category contains road vehicles and transportation equipment. Due to the rapid onset of automobile production and air travel during our sample, we aggregate these to maintain a consistent set of these products over time.

Splitting: (SITC 83 & 86) Because these categories are infrequently populated in of our samples, we map each product to the product which comprises the majority of its inputs. This is almost exclusively re-categorizing rubber footwear to rubber, or leather footwear and luggage to leather products, or wood and wicker baskets to wooden products. These are groups 61 (Leather products), 62 (Rubber manufactures), and 63 (Cork and Wood a.m.o.). Residual uncategorizable products are assigned to 89 (Miscellaneous manufactured article n.e.s.)

Dropped: (SITC 87): This is comprised of professional scientific instruments, and does not appear before 1930. Consequently we omit these from our analysis.

Dropped: (SITC 89) This is comprised of Miscellaneous manufactured articles, nes. While it is always populated, the products have little to no cohesive commonality or obvious means of mapping to labor markets. This is a small portion of our data and is omitted.

Dropped: (SITC 96-97) These categories include coin and non-monetary gold. Due to the reliance on the gold standard during this period we omit golds and gold related products and coins.

B Data Sources and Variable Construction

B.1 US Tariff and Import Data, 1900-1940

Foreign Commerce and Navigation of the United States (FCNUS)

For every five years between 1900 and 1930, we digitize the Foreign Commerce and Navigation of the United States (FCNUS) and obtain imports and tariffs by type at the tariff-line level. This digitization results in 25,042 tariff line observations from 1900 to 1930. For each tariff line we identify the appropriate industry based on the SITC revision 2 classification as amended in section A based *solely* on product names. This yields a consistent mapping of products over time. We provide details of this data in its raw form in Table B1. The first two columns indicate the year

Table B1: FCNUS Data Sources

Year	Policy Regime	Data Source	Table	Pages	Tariff Lines	Coverage
1900	Dingley	FCNUS	No. 15	943-1116	2269	95.4%
1905	Dingley	FCNUS	No. 15	930-994	2562	98.9%
1910	Payne-Aldrich	FCNUS	No. 15	943-1147	4173	95.5%
1915	Underwood	FCNUS	No. 9	821-869	2725	96.0%
1920	Underwood	FCNUS	No. 9	525-574	2839	95.2%
1925	Fordney-McCumber	FCNUS	No. 9	15-88	5490	95.0%
1930	Smoot-Hawley	FCNUS	No. 9 Part 2	569-647	4984	95.4%

Notes: Table presents information about the raw tariff line data which form the basis of our analysis. Tariff lines indicates the number of unique tariff line items in each year's data. Coverage indicates the percent of import value which we were able to categorize to a 2-digit SITC revision 2 industry as amended in section A

and prevailing trade-policy regime. The next three columns indicate the data source, table, and pages digitized to obtain our tariff data. The column indicated by tariff lines indicates the number of tariff lines obtained from digitizing the raw data. Coverage indicates the value share of total imports covered by our final sample in each year. Coverage is always less than 100% due to sample restrictions described in appendix A – some imports are un-classifiable or are omitted intentionally (e.g. alcoholic beverages) to ensure consistent coverage of imports.

Our identification strategy requires us to identify the type of duty (specific, compound, or ad-valorem) in order to construct industry AVE and STS. The duty type is readily apparent in the raw data, as can be seen in figure B1, which reproduces a sample of the undigitized FCNUS data from 1900. We have indicated the duty-free products in gray and specific (both compound and specific only) in purple and salmon. Blue are ad valorem only.

Figure B1: FCNUS Tariff Data

IMPORTED MERCHANDISE ENTERED FOR CONSUMPTION IN THE UNITED STATES, INCLUDING BOTH ENTRIES FOR OF DUTY COLLECTED DURING THE YEARS

1900.

ARTICLES.	Rates of duty.	Quantities.	Values.	Duties.	AVERAGE. Value per unit of quantity.	AVERAGE. Ad valorem rate of duty.
Brass, and manufactures of:			*Dollars.*	*Dollars.*	*Dollars.*	*Per cent.*
Old brass, clippings from brass or Dutch metal, fit only for remanufacture (pounds).	Free	4,573,487	553,307.65		0.12	
Wire cloth (pounds)	1¼ cents per pound and 45 per cent.	354.50	497.00	228.08	1.40	45.89
Manufactures of, not specially provided for	45 per cent		25,104.93	11,297.22		45
	Duty remitted (Secs. 2513 and 2514, R. S.)		215.00			
Total brass, and manufactures of	Free		553,307.65			
	Dutiable		25,816.93	11,525.30		44.64
Brazilian pebble, unwrought or unmanufactured	Free					
Breadstuffs:						
Barley (bushels)	30 cents per bushel	161,613.83	78,257.52	48,484.15	.484	62
Barley, pearled, patent, or hulled (pounds)	2 cents per pound	178,999	23,212.50	3,579.98	.129	15.43
Bran and mill feed	20 per cent		47,786.45	9,557.29		20
Bread and biscuit	20 per cent		95,887.71	19,177.55		20
Buckwheat (bushels)	15 cents per bushel	285.17	131.50	42.78	.461	32.65
Buckwheat flour (pounds)	20 per cent	68,370	929.50	185.90	.013	20
Corn or maize (bushels)	15 cents per bushel	3,595.34	3,182.08	539.31	.885	16.94
Corn or maize, burnt or roasted	20 per cent		172.00	34.40		20
Corn meal (bushels)	20 cents per bushel	68.40	85.84	13.71	1.26	16.13
Macaroni, vermicelli, and all similar preparations (pounds).	1½ cents per pound	18,608,037	820,163.05	279,120.58	.044	34.03
Oat hulls (pounds)	10 cents per 100 lbs.	5,649,850	13,085.00	5,649.85	.002	43.46
Oats (bushels)	15 cents per bushel	40,554.93	18,361.67	6,083.26	.453	33.24
Oatmeal and rolled oats (pounds)	1 cent per pound	241,674.50	14,313.70	2,416.75	.059	16.9
Rye (bushels)	10 cents per bushel	330	366.00	33.00	1.11	9.02
Rye flour (pounds)	½ cent per pound					
Wheat (bushels)	25 cents per bushel		4,705.87	862.97	1.36	18.34
Wheat, crushed	20 per cent	773.09	1,422.00	284.40		20
Wheat flour (barrels)	25 per cent	3,451.88	3,757.12	939.29	4.86	25
Wheat screenings	10 per cent		1,313.00	131.30		10
Total breadstuffs			1,127,132.51	377,136.47		33.46

Notes: Figure displays pre-digitized data from the 1900 Foreign Commerce and Navigation of the US. Color coding reflects duty type. Grey are duty free. Purple are compound duties which we classify as specific tariffs. Salmon are specific (per-unit) tariffs. Blue are ad-valorem duties.

We calculate specific tariff shares at the industry level by summing all duties among goods with any specific component and dividing the sum by total duties collected within an industry. Similarly, industry-level AVEs are calculated by dividing total duties by total imports in the industry.

Statistical Abstract of the United States (SAUS)

We also digitize the Statistical Abstract of the Untied States (SAUS) every five years between 1900 and 1940. These flows are far more aggregate than the tariff line data and include between 200 and 400 line items annually. These data allow us to construct a measure of imports when the FCNUS would be insufficient. For example, in 1930 imports in the FCNUS span two volumes. Our sample described above only reflects the second volume because the Smoot-Hawley tariff was enacted in the middle of 1930. As a consequence, import values in this FCNUS volume are substantially less than the total import values for 1930. By using the SAUS, we are able to construct a consistent measure of imports for each year. Again, we manually concord these products to their industry counterparts based on name for each year in our series.

Table B2: SAUS Data Sources

Year	Policy Regime	Data Source	Table	Pages	Product Lines	Coverage
1900	Dingley	1905 SAUS	No.72	273-302	207	93.3%
1905	Dingley	1905 SAUS	No.72	273-302	208	91.8%
1910	Payne-Aldrich	1919 SAUS	No. 282	425-472	261	93.7%
1915	Underwood	1919 SAUS	No. 282	425-472	261	95.1%
1920	Underwood	1921 SAUS	No. 308	483-521	490	97.9%
1925	Fordney-McCumber	1929 SAUS	No. 538	550-585	189	96.4%
1930	Smoot-Hawley	1934 SAUS	No. 491	486-520	193	94.5%
1935	Smoot-Hawley	1938 SAUS	No. 536	523-561	187	93.9%
1940	Smoot-Hawley	1941 SAUS	No. 603	613-651	191	95.5%

Notes: Table presents information about the raw import data used in our analysis. Product lines indicates unique lines from the respective table. Coverage indicates percent of import value which we were able to categorize to a 2-digit SITC revision 2 industry as amended in section A.

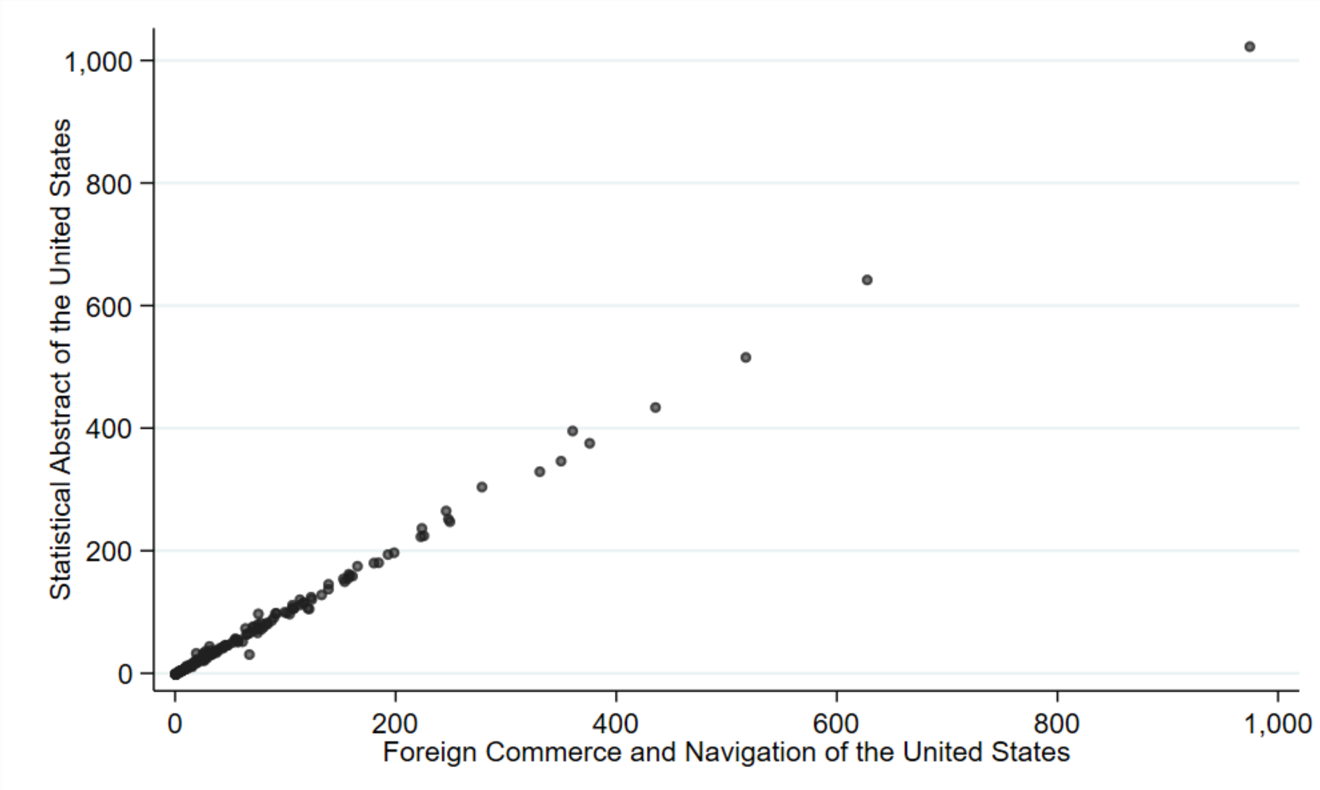
While both the FCNUS and SAUS report US import values at a disaggregate level, their coverage does differ. The primary difference between the series is that the FCNUS reports imports for consumption (upon which duties may be levied) while the SAUS reports total imports. These may differ if, for example, imports enter the US into bonded storage or for re-export. In such a case, the FCNUS would not report an item in the import data, while SAUS would.

Practically, however, this distinction makes little difference for our analysis. In figure B2, we compare real import values across these two sources between 1900 and 1925.[54] The industry-level import values across the two sources are correlated at 99.74%. Given the fact that both sources were separately concorded to SITC industries, this also provides a check on the accuracy of the concordances.

Due to its availability throughout the entirety of the sample, we use SAUS data to construct import values in our analysis. However, our results are robust to using import values from the FCNUS whenever possible. Specifically, for log changes ending *prior* to 1930 we have data for the

[54] As noted above, although we do have the FCNUS import values under the Smoot-Hawley tariff of 1930, we exclude these data from our comparison because the Smoot-Hawley tariff is implemented partway through 1930 making the FCNUS part 2 an incomplete source for imports in that year.

Figure B2: Real Imports at Census Industry: SAUS vs FCNUS



Notes: This figure presents a scatterplot of the real value of imports digitized from the Foreign Commerce and Navigation of the United States and the Statistical Abstract of the United States. Values are calculated at the 2-digit SITC level and are reported in millions of 1900 USD.

full year's imports from the FCNUS for both the starting and ending periods. This allows us to construct log import growth from the FCNUS. When we do not – i.e., during 1920-1930, 1925-1930, and 1930-1935, 1930-1940 – we use the SAUS to construct log industry import growth. Our results are unaffected by this alternative approach.

B.2 US Import and Tariff Data, 1848-1861

This section details the data used in construction of the Morrill Tariff tariff measures, as well as imports in the 13 years immediately preceding the Morrill Tariff. This period was defined by two tariff regimes, the Walker Tariff of 1846 and the Tariff of 1857. Import data are reported in the Foreign Commerce and Navigation of the United States over fiscal years beginning July 1 and ending on June 30. For example, the first year of this series is published in 1849 and provides coverage of imports from July 1, 1847 to June 30, 1848. With the exception of the Morrill Tariff year itself sample, all of our data from 1848 to 1860 span the same 12-month period. The Morrill

Tariff was enacted on March 2, 1861. Consequently, the initial sample of this data span March 2, 1861 through the end of the 1861 fiscal year on June 30, 1861. The full series description for each sample can be found in table B3

Table B3: CNUS Data Sources

Year	Policy Regime	Data Source	Table	Pages
1847/1848	Walker	Commerce and Navigation of the US	No. 6 A.	258-270
1848/1849	Walker	Commerce and Navigation of the US	No. 6	266-278
1849/1850	Walker	Commerce and Navigation of the US	No. 6	268-280
1850/1851	Walker	Commerce and Navigation of the US	No. 6	274-287
1851/1852	Walker	Commerce and Navigation of the US	No. 6	266-275
1852/1853	Walker	Commerce and Navigation of the US	No. 6	266-275
1853/1854	Walker	Commerce and Navigation of the US	No. 6	276-285
1854/1855	Walker	Commerce and Navigation of the US	No. 6	292-301
1855/1856	Walker	Commerce and Navigation of the US	No. 6	284-293
1856/1857	Walker	Commerce and Navigation of the US	No. 6	272-281
1857/1858	1857	Commerce and Navigation of the US	No. 6	294-305
1858/1859	1857	Commerce and Navigation of the US	No. 6	290-301
1859/1860	1857	Commerce and Navigation of the US	No. 6	294-305
1861/1861†	Morrill	Commerce and Navigation of the US	No. 9	368-535

Notes: This table presents information regarding the sources of raw US import data used in our Morrill Tariff placebo and IV analysis found in section 4. A sample of this data may be found in B3. Trade flows were mapped to industries as described in appendix A.

For all years, we digitize import values and quantities, units, duties paid, duty type, and unit duties. We manually link each product to its nearest 2-digit SITC industry via the process described in Section A. Of the 34 industries found in our primary sample, 29 are present in the Morrill Tariff data while 31 are available in the preceding 13 years. They are jointly defined for 28 of those industries. SITC codes 22, 57, and 82 are absent from the Morrill Sample, while SITC 79 is absent from the 1848-1860 sample.

B.2.1 Morrill Tariff Duties and Specific Tariff Share

As noted above, trade flows are recorded by fiscal year. Unlike our baseline FCNUS sample from 1900-1940, duties are not reported directly. Instead, they must be calculated using the duty rates, value, and quantity – all of which are reported in the Commerce and Navigation of the United States. A sample of these data may be found in B3.

To see how these data may be used to calculate tariffs and specific tariff shares by industry, consider the product listed "Jute sisal grass, sun hemp, coir, and other vegetable substances not specified used for cordage." Value is recorded in current US dollars, while the units are specified

Figure B3: Sample of CNUS Data from Morrill Tariff Era

No. 9.—*General statement of foreign imports*—Continued. 410 COMMERCE AND NAVIGATION.

	WHENCE IMPORTED.	MERCHANDISE PAYING SPECIFIC DUTIES. HEMP AND MANUFACTURES OF HEMP, JUTE, AND COIR.									
		Manilla and other hemps of India.		Jute, Sisal grass, sun hemp, coir, and other vegetable substances not specified, used for cordage.		Cables, cordage, and yarns. All other cordage, untarred.		Cables, cordage, and yarns. Other yarn.		Seines.	
		Duty—15 dollars per ton.		10 dollars per ton.		3 cents per pound.		4 cents per pound.		6 cents per pound.	
		Cwt.	Dollars.	Cwt.	Dollars.	Pounds.	Dollars.	Pounds.	Dollars.	Pounds.	Dollars.
1	Sweden and Norway										
2	Swedish West Indies										
3	Denmark										
4	Danish West Indies										
5	Hamburg										
6	Bremen										
7	Holland										
8	Dutch West Indies										
9	Dutch Guiana										
10	Dutch East Indies										
11	Belgium										
12	England	319	1,913					977	184		
13	Scotland										
14	Ireland										
15	Gibraltar										
16	Malta										
17	Canada					65	7			4	2
18	Other British North American Possessions									50	10
19	British West Indies										
20	British Honduras										
21	British Guiana										
22	British Possessions in Africa										
23	British East Indies			370	1,082						
24	France on the Atlantic										
25	France on the Mediterranean										
26	French West Indies										
27	French Guiana										
28	Spain on the Atlantic										

as Cwt. (United States hundredweight), and the specific tariff is listed on a per ton basis. Total duties on this product are calculated by converting quantity to tons (dividing observed units by 20) and then multiplying the resulting units by $10. We manually check each of the roughly 450 products found in the Morrill tariff data and convert units into the units on which the duty are levied. We then construct STS and AVE at the industry level as in our primary sample. Figure B4 presents the relationship between these two variables.

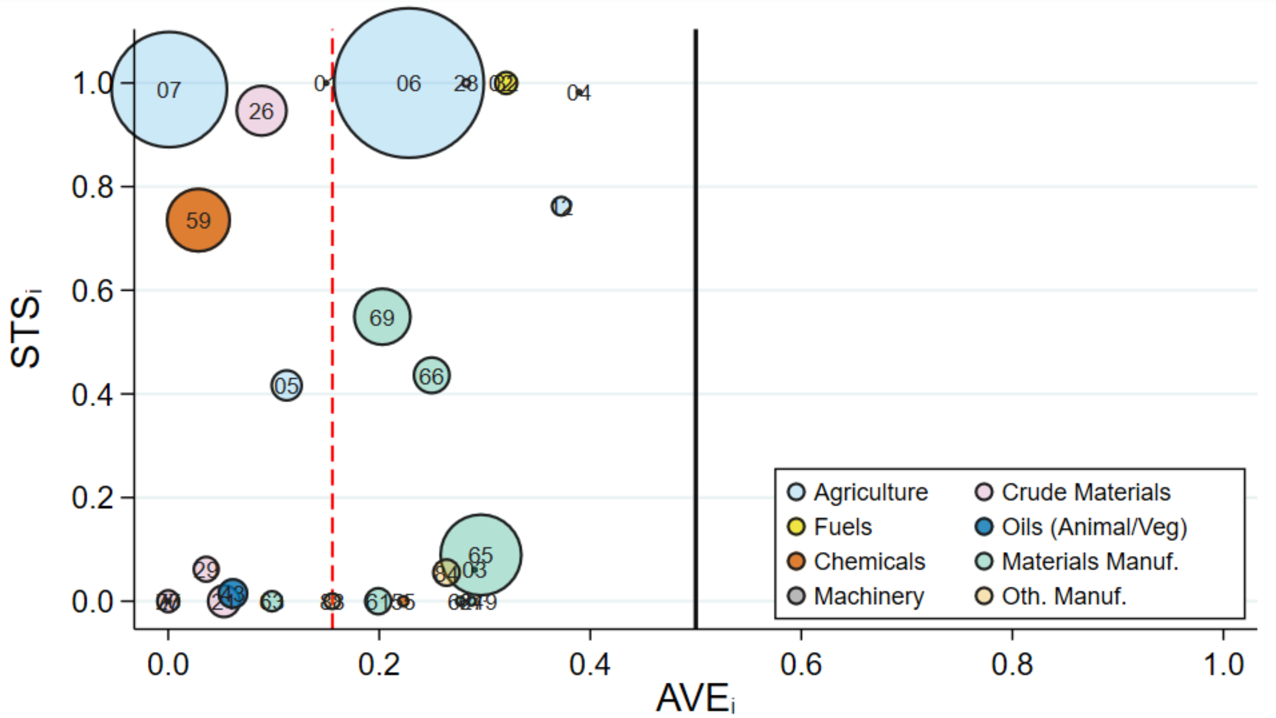
B.3 UK Import Data and Unit Value Construction, 1900-1938

Statistical Abstract for the United Kingdom (SAUK)

We digitize data from four editions of the Statistical Abstract from the United Kingdom. From these we take import values, quantities, and product names. We link these to the SITC revision 2 as above. The import data are recorded at a more aggregate level in the last two decades of our sample. Sources may be found in Table B4.

We record bookend periods in duplicate – once from each edition – to ensure that if reported

Figure B4: Industry level STS_i versus AVE_i by Morrill Tariff



Notes: Figure displays the Specific Tariff Share (STS_i) versus the Ad Valorem Equivalent (AVE_i) for the Morrill Tariff of 1861. Industries are two digit SITC REV-2 industries. Marker size proportional to share of start of period imports. Solid vertical line indicates a 50% Ad Valorem Equivalent Tariff while dashed line indicates policy Ad Valorem Equivalent Tariff.

Table B4: Sources of UK Import Data

Year	Text	Table	Pages
1900-1910	1915 SAUK	No. 39	126-160
1910-1920	1924 SAUK	No. 34	88-120
1920-1930	1932 SAUK	No. 240	350-360
1930-1938	1940 SAUK	No. 285	392-402

Notes: Sources of import values and quantities digitized and used in construction of UK import flows and industry price growth.

product categories have changed across editions, we do not construct a change in imports spanning two distinct levels of aggregation. For example, we obtain 1900, 1905, and 1910 from the same edition and then additionally digitize 1910 from a second edition. Because the 1940 data are not available, we digitize the 1938 file and scale up all changes as needed to construct 5-year or ten-year equivalent growth in imports and prices.

We assess the quality of our approach by also digitizing "category" level imports and ensuring that the total value of constituent products match these product group aggregate values. For example, in the figure below we check to see that the total value of imported goods categorized under Article I.A. in 1900 is equal to the category total – 62,992,082.

Figure B5: Sample of 1900-1905 Import Values

IMPORTS—VALUE. 142

No. 39.—DECLARED VALUE of the PRINCIPAL and OTHER
(Exclusive of Bullion and Specie.

NOTE.—*The figures given in italics for the totals of the Groups of the several owing to a change in the classification*

ARTICLES.	1900.	1901.	1902.	1903.	1904.	1905.	1906.	1907.
I.—FOOD, DRINK, AND TOBACCO.								
A.—GRAIN AND FLOUR:	£	£	£	£	£	£	£	£
Wheat	23,345,929	23,081,372	27,079,823	29,940,191	34,266,416	35,279,931	32,676,185	37,346,548
Barley	5,152,977	6,163,012	7,136,321	7,230,741	7,171,115	6,031,644	5,677,587	6,564,670
Oats	5,236,409	6,347,719	5,041,323	4,263,950	3,726,120	4,713,265	4,532,160	3,383,553
Maize	12,327,859	12,387,225	11,713,132	12,465,583	10,247,134	11,034,748	11,972,694	14,604,504
Peas (other than fresh), including Split Peas.	780,138	747,168	740,123	690,768	767,097	725,104	614,649	602,648
Beans (other than fresh), including Split Beans.§	536,898	629,831	§ 787,290	738,044	676,284	535,519	383,668	450,539
Lentils, including Split Lentils	Incl. with "Seeds, Tares and Vetches" (Class II., Sec. K.).		* 41,837	52,969	62,078	61,079	53,048	94,991
Rye	359,800	344,383	312,206	302,701	280,303	305,293	323,345	317,456
Wheatmeal and Flour	10,102,548	10,341,519	8,925,617	9,723,652	7,258,600	6,044,845	6,817,213	6,694,082
Oatmeal, Groats, and Rolled Oats (including Quaker Oats).	523,765	546,132	486,241	537,415	456,593	463,293	495,980	479,352
Maize Meal	456,449	457,345	83,270	176,622	100,940	144,829	195,302	213,581
Rice	} 2,408,069	2,477,465	2,524,156	2,015,188	2,228,097	2,295,756	2,259,732	2,800,464
Rice Meal and Flour				347,103	403,126	562,197	743,847	536,300
Meal, Other	84,886	83,239	‡267,965	250,759	254,537	138,531	239,463	186,437
Other Farinaceous Substances and Manufactures.†	1,676,355	809,695	844,696	906,719	897,257	864,251	895,516	1,133,941
Total of Grain and Flour	*62,992,082*	*64,416,105*	*65,984,000*	69,642,405	68,796,597	69,200,285	67,880,589	75,409,156

Notes: Figure displays sample of data taken from page 142 of Statistical Abstract for the United Kingdom, 1915.

Each of the aforementioned series were of sufficient quality to match import aggregate import values from these tables almost exactly with the exception of the 1905 data from the 1915 edition of the Statistical Abstract for the United Kingdom. When data were illegible (e.g. import values for steel manufactures on page 152), we turned to the 1919 edition to verify the values and quantities.

Industry Price Indices

When constructing five- or 10-year changes in price at the industry level, we restrict our attention to products for which we can identify an appropriate SITC code, for which we are able to construct a unit price during both periods, and for which the units in both periods allow for comparison via a consistent unit value. If unit conversions are feasible – e.g., UK CWT (hundredweight), or UK Tons to 112 lbs. and 2240 lbs. respectively – we make the appropriate quantity conversion to calculate unit values. If this is not the case – e.g., wine counted in bottles in 1900 and kegs in 1905 – then the product is not included in constructing changes in unit values across periods. Table B5 reports the percent of aggregate import value for which we are able to map to an SITC-2 code in column 2. Columns 3 and 4 report the percent of this value utilized in construction of SITC-2 level changes in log unit values.

Table B5: Value Share Coverage

Year	SITC	5-year $\Delta Ln(P_{it})$	10-year $\Delta Ln(P_{it})$
1900	0.982	0.884	0.884
1905	0.980	0.910	-
1910	0.964	0.899	0.899
1915	0.974	0.933	-
1920	0.998	0.901	0.901
1925	0.997	0.882	-
1930	0.997	0.875	0.875
1935	0.998	0.8 80	-

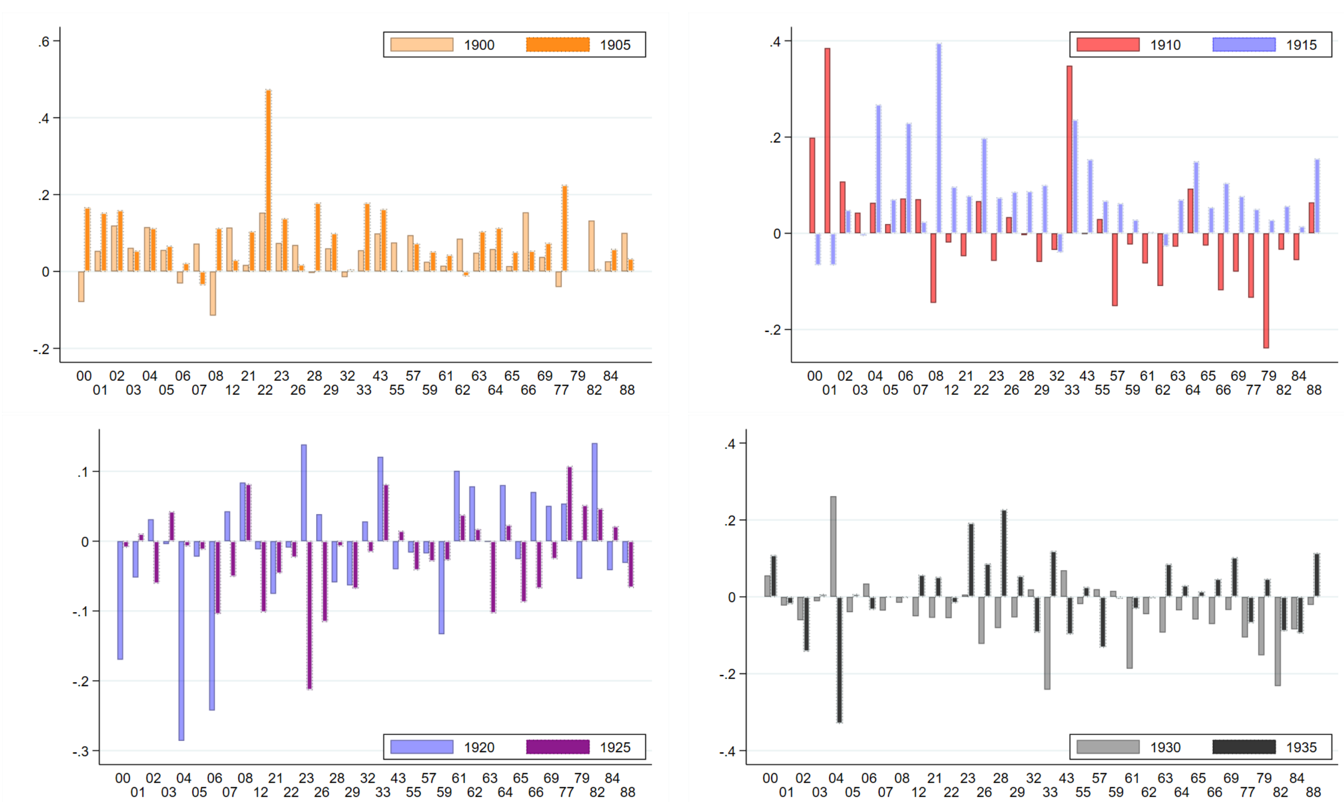
Notes: Share of total imports used in construction of UK import values as well as share of these values used in constructing 5-year and 10-year industry price growth.

We calculate within-product changes in log prices by aggregating to the SITC-2, weighting by start-of-period import values. For example, textile manufactures (SITC 65) contains information on silk and cotton products. To construct the change in log prices for SITC 65, we first construct the log change in prices among the nonmissing silk and cotton unit values separately. We then take an expenditure-weighted average of the cotton and silk products among all cotton and silk expenditures. Finally, for some years we are unable to construct a product-level unit value for any product within an SITC category. In such situations, we substitute the aggregate UK CPI as our measure of industry price growth.

C Industry Import Growth Descriptives and Robustness

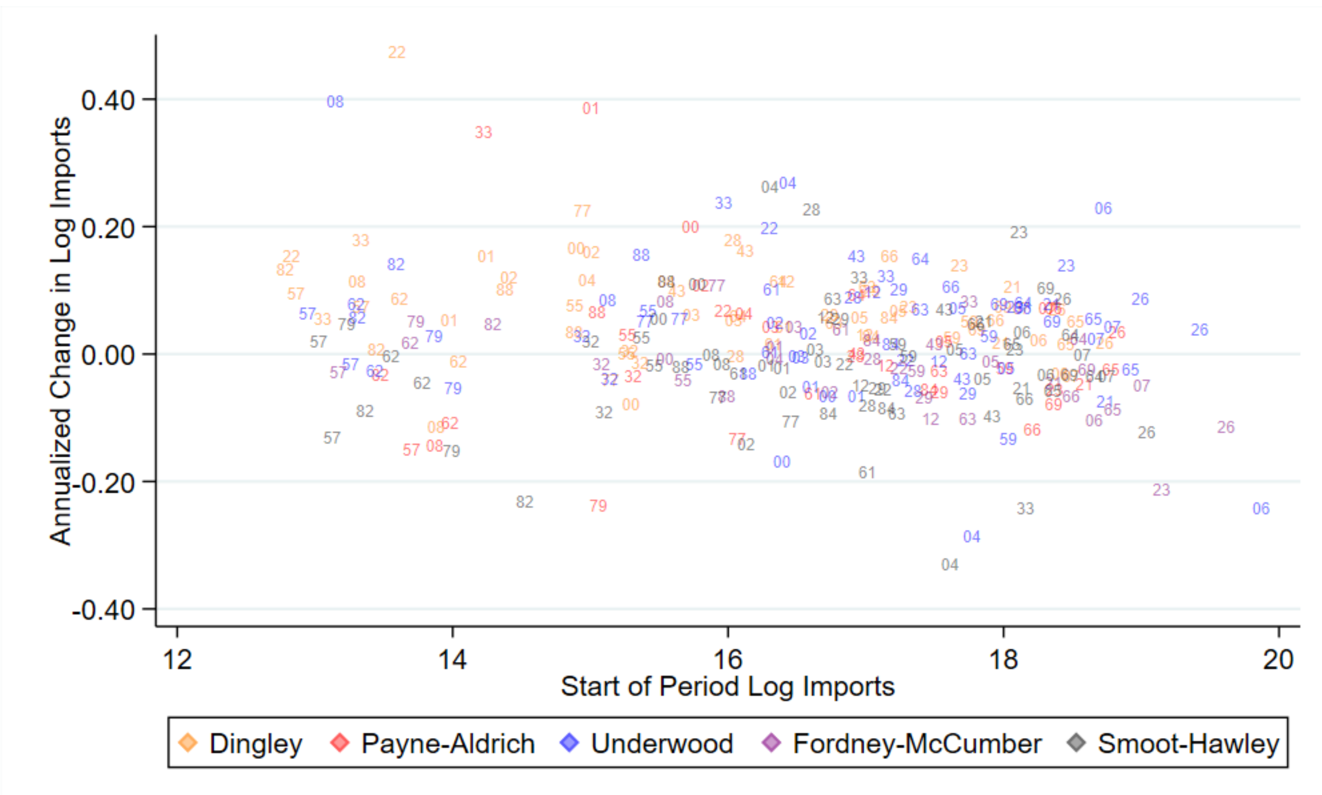
In this section we provide additional information regarding industry-level trade flows and robustness to the baseline industry specifications found in section 4. We begin by detailing the relative importance of various US sectors in driving import growth during our sample. To do so, we provide two characterizations of our data. In figure C1 we display annualized US log import growth for each five-year period in our sample. This variation underlies the dependent variable in our industry level analysis found in 4. These are color coded to match their use elsewhere in the paper and reflect the trade policy in place at the start of period – the Dingley Tariff (orange), Payne-Aldrich (red), Underwood-Simmons (blue), Fordney-McCumber (purple), and Smoot-Hawley (Gray).

Figure C1: Annualized Log Import Growth by Industry



Given the heterogeneous importance of sectors in the overall composition of US imports, we also present a scatterplot of the relationship between real log import growth versus start of period real log imports in figure C2.

Figure C2: Growth in Log Imports vs Log Imports by Industry and Policy



Notes: This figure presents annualized 5-year import growth for from 1900-1940 by 2-digit SITC industry as amended in Appendix A. Imports are digitized from the Foreign Commerce and Navigation of the United States and Statistical Abstract of the United States.

Additional Robustness

We now turn to additional specifications of our industry analysis. We begin by providing summary statistics for the 10-year changes in log imports, realized protection, AVE and STS. These can be found in C1 and are the counterpart to the five-year sample found in 2 in the primary text. The series found in both tables have been annualized to facilitate comparison.

Table C1: Summary Statistics for 10 Year Sample, Annualized

	1900	1910	1920	1930	Total
$\Delta Ln(Imports^{US}_{it})$	0.072	0.045	-0.015	-0.019	0.021
	(0.080)	(0.082)	(0.062)	(0.053)	(0.080)
$-\Delta Ln(UK^{CPI}_{t})STS_{it_0}$	-0.003	-0.054	0.014	-0.009	-0.013
	(0.002)	(0.037)	(0.016)	(0.006)	(0.033)
$-\Delta Ln(UK^{UV}_{it})STS_{it_0}$	-0.002	-0.064	0.033	0.009	-0.006
	(0.027)	(0.050)	(0.050)	(0.021)	(0.053)
AVE_{it_0}	0.303	0.238	0.091	0.204	0.208
	(0.279)	(0.191)	(0.111)	(0.196)	(0.214)
STS_{it_0}	0.647	0.557	0.377	0.574	0.538
	(0.364)	(0.384)	(0.418)	(0.380)	(0.396)

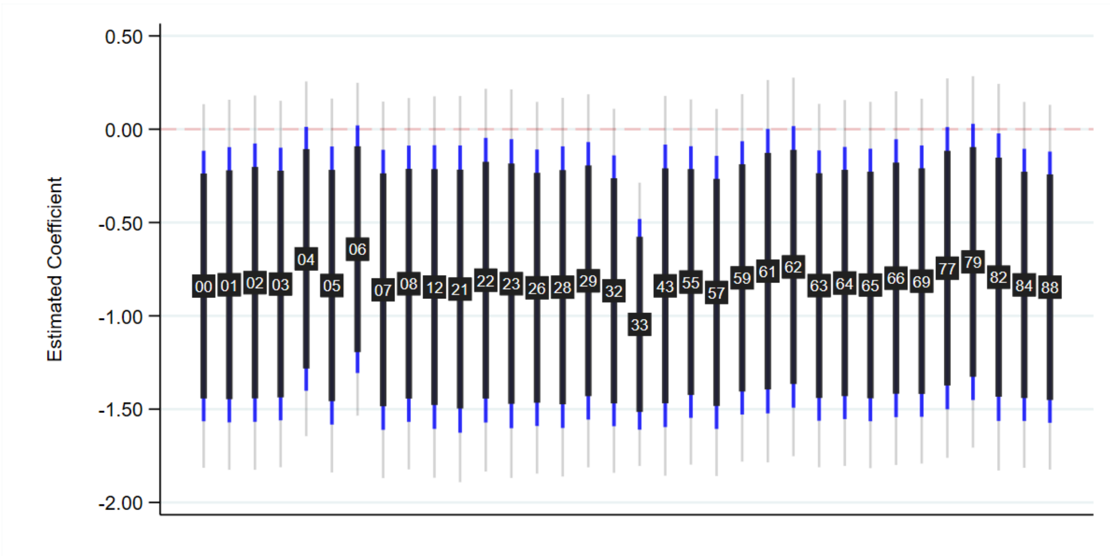
Notes: Table presents summary statistics for 10-year industry import growth and changes in realized protection. For ease of comparison with table 2, all variables have been annualized. Variable means are reported above variable standard deviations (in parenthesis).

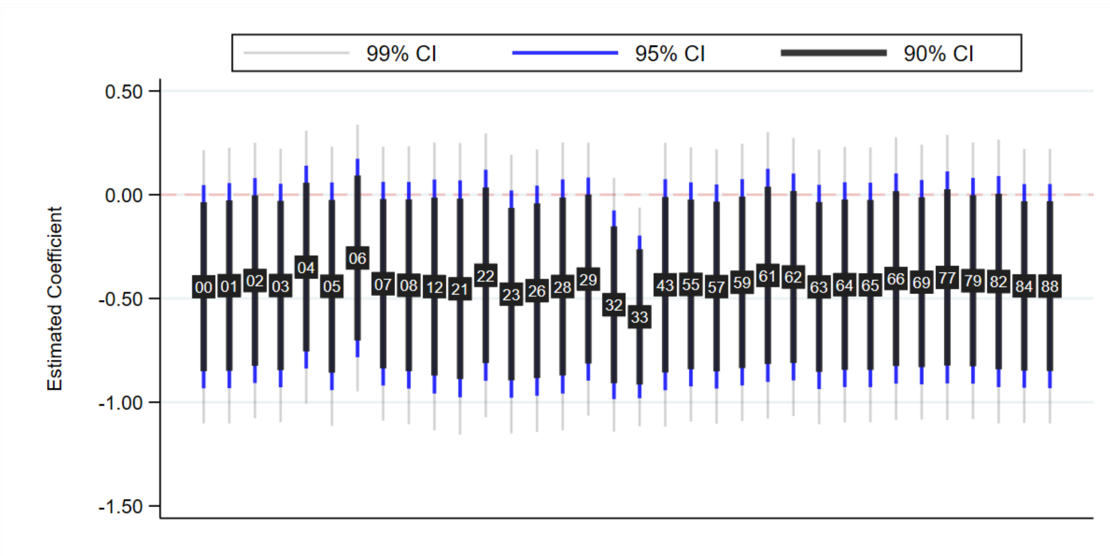
In figure C3 we demonstrate that our primary findings are not driven by any single industry. To do so, we estimate our industry-level import growth regressions as in columns 3 and 7 of table 3, sequentially omitting each 2-digit SITC code in our sample. We report the primary coefficient of interest (ΔRP_{it}) from these specifications with the omitted industry indicated in the circle. Standard error bars indicate significance at 10, 5, and 1% respectively. In the top panel we report the estimates using the aggregate CPI while the bottom panel reports the same when using industry-level prices. The industry-level specification additionally controls for the direct effect of changes in industry prices on imports.

In figure C4 we estimate an analogous specification, sequentially dropping each five- and 10-year period in our sample. We estimate our industry-level import growth regressions as in columns 3 and 7 of Table 3. We report the primary coefficient of interest (ΔRP_{it}) with similarly constructed standard error bars. In the top panel the point estimate was obtained by using the aggregate UK CPI to construct changes in realized protection, while in the bottom panel the estimate was

Figure C3: Annualized Log Import Growth Omitting Industries

(a) $\Delta RP_{it} \equiv -\Delta Ln(UK_t^{CPI})STS_{it_0}$





(b) $\Delta RP_{it} \equiv -\Delta Ln(UK_{it}^{UV})STS_{it_0}$

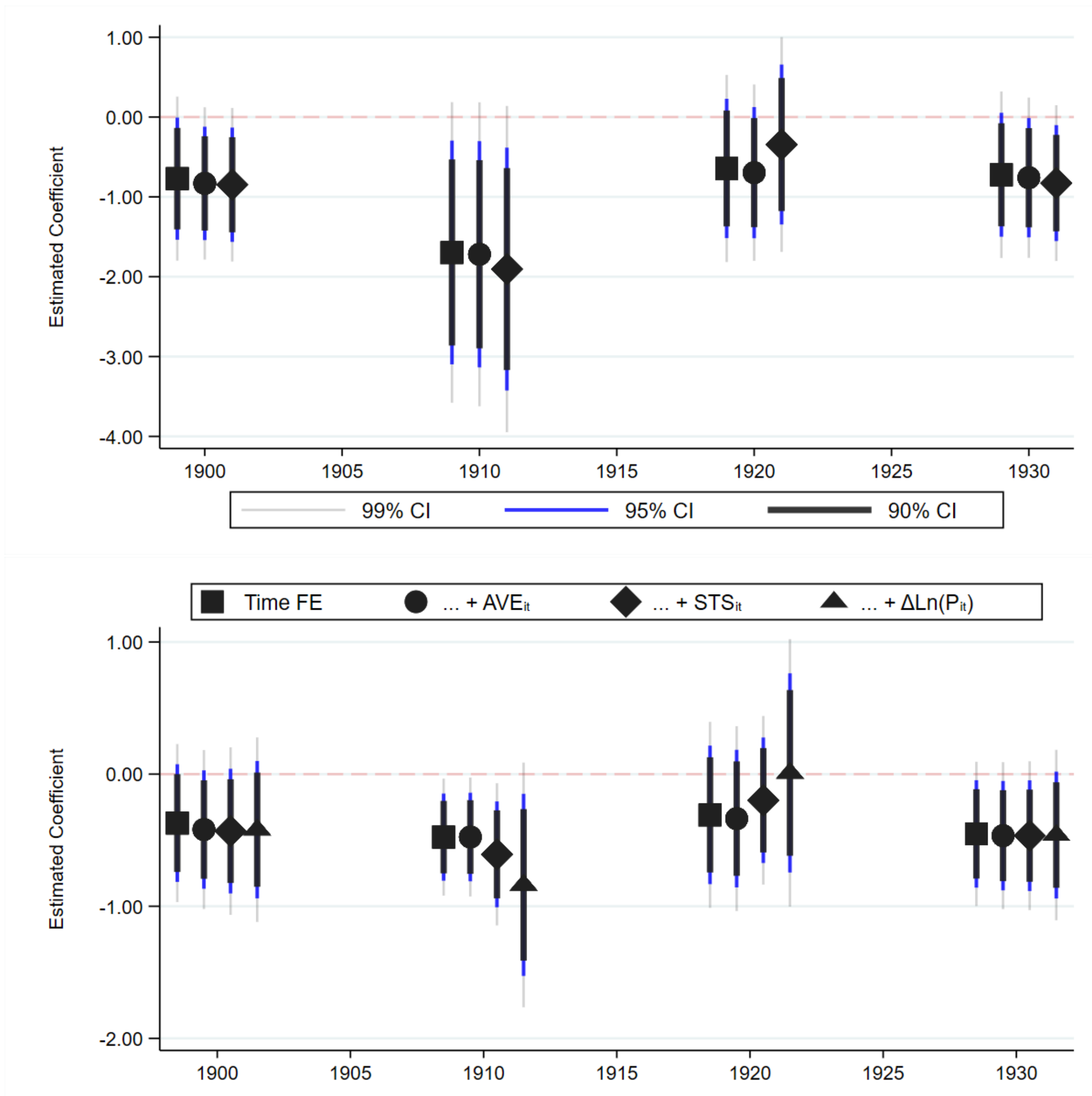
Notes: Each vertical bar is the primary coefficient from table 3 estimated by omitting the indicates 2-digit SITC code. Panel C3a replicates column 3 which relies on UK CPI for price variation, while Panel C3b replicates column 7 which relies on UK industry import unit values for price variation. Black, blue, and grey bars indicate 90%, 95%, and 99% confidence intervals respectively.

obtained using industry-level prices. The shape of the marker indicates the set of controls included.

Each of these specifications cuts our sample size by 25%. Nonetheless, our primary finding holds across nearly all specifications and sample cuts. Even omitting the 1920 sample, our estimated

Figure C4: Annualized Log Import Growth Omitting Decades

(a) $\Delta RP_{it} \equiv -\Delta Ln(UK_t^{CPI})STS_{it_0}$



(b) $\Delta RP_{it} \equiv -\Delta Ln(UK_{it}^{UV})STS_{it_0}$

Notes: Each vertical bar is the primary coefficient from table 3 estimated by omitting the time period indicated on the horizontal axis. Each marker indicates the covariates included in our regression and the ellipses ... indicate that all previously mentioned covariates are also included in that specification. Panel C3a relies on UK CPI for price variation and replicates columns 1-3, while Panel C3b relies on UK industry import unit values for price variation and replicates columns 4-7. Black, blue and gray bars indicate 90%, 95%, and 99% confidence intervals respectively.

effects become noisier upon inclusion of the industry specific tariff share as well the direct measure of changes in industry prices. This is likely the result of a multi-collinearity issue between time fixed effects, specific tariff shares, and price movements during the remaining decades.

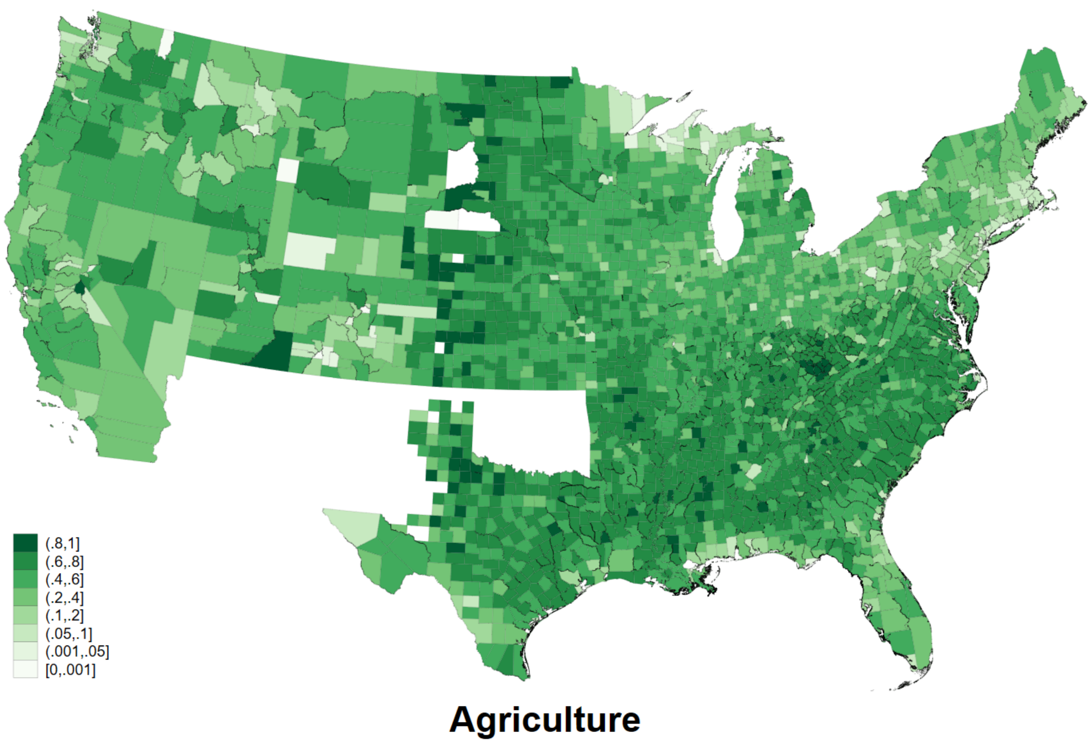
To see this point more clearly, consider that in our baseline industry estimates in table 3 we find that neither the specific tariff share nor direct price effects are significant predictors of import growth on their own, but both are highly correlated with ΔRP_{it}. This collinearity becomes particularly salient when omitting the 1920 decade, which represents the largest deflationary period in our sample. Removing this decade leaves only strongly inflationary or flat price growth. Given the persistence of industry reliance on specific tariffs documented in tables 7 and 8, the time fixed effects, specific tariff shares, and direct measures of industry prices (in panel C4b) absorb too much of the variation for our primary coefficient to be identified precisely. We note that in our labor market application, the fist stage county-level log import growth per work remains significant when the 1920 period is omitted even when specific tariff shares are included – likely due to the increased power afforded by the additional cross-sectional variation in county-level specific tariff shares.

D Spatial Labor Market Descriptives and Robustness

This appendix provides more detailed information regarding our spatial mapping of trade flows to labor markets in section 5, as well as additional descriptive features of the labor market shock.

In order to construct our shift share shock we map national import growth to counties by creating an employment-weighted average of national industry imports. We note the importance of the agricultural sector in this weighting. We display the share of county employment accounted for by agriculture in figure D1.

Figure D1: Employment Shares in Agriculture, 1900



Notes: Agricultural production corresponds to 1990 IPUMS Census industries 010 and 011..

On average, one-third of county-level employment is engaged in agriculture. Due to the importance of agriculture as a whole, as well as the geographic dispersion of crops, we separate four major crops from our industry import data and map them to labor markets with the aid of the NHGIS county-level acreage data from 1899. These data provide county-level acreage by crop type for each of 37 crops. Displayed in D2 one can see that the vast majority (over 93%) of all acreage is used in the production of 5 crops: Corn, Grasses, Wheat, Oats, and Cotton. Of these, we can readily identify Corn, Wheat, Oats, and Cotton in both the FCNUS, SAUS, and SAUK data.

Figure D2: Aggregate Agricultural Share of Acreage by Crop, 1900

Notes: Data taken from the NHGIS.

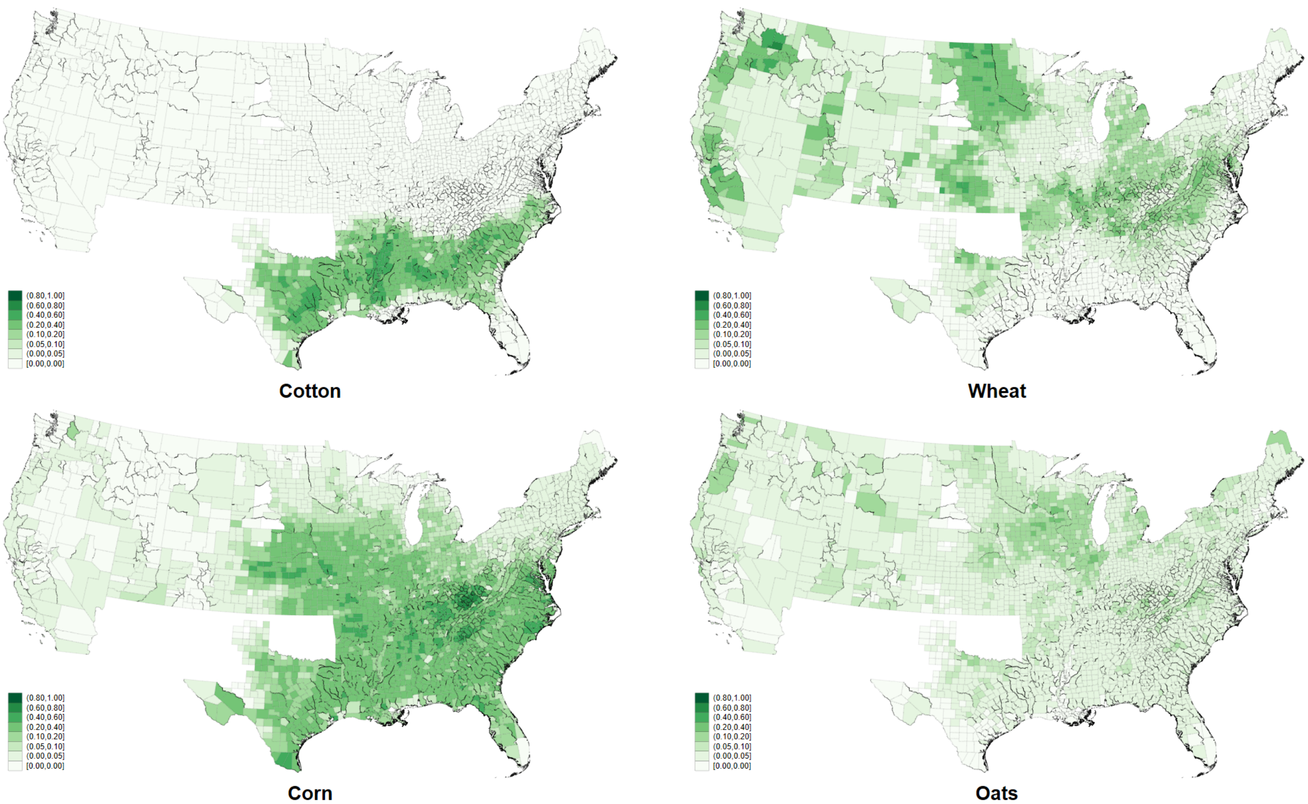
We thus construct acreage-share-based employment weights for agricultural workers within a county based on corn, oats, wheat, cotton, and “other”, which serves as a composite residual category. We display this variation in D3.

For all other products, we map imports to labor markets by concording trade flows to the Census Industry (IND1990) through three steps. First, using a conversion table provided by UN Trade Statistics we map SITC codes to the 6-digit 1993 Harmonized System (HS) classification scheme.[55] This is an n-to-one mapping, so we apportion trade SITC flows to each HS product weighting by the inverse number of HS codes to which a given SITC code concords.

We then map from HS to 4-digit SIC codes using the concordance constructed by Pierce and Schott (2012). We apportion these codes in equal share to the SIC products to which they concord. Again, we weight trade flows by the inverse number of SIC products to which an HS code maps.

[55] https://unstats.un.org/unsd/trade/classifications/correspondence-tables.asp

Figure D3: Employment Share Attributed to Major Crop Groups



Finally, we concord SIC codes to Census industry codes using the concordance provided by James Lake (http://p2.smu.edu/jlake/data_code.html).

The 1900-1940 census data contain information regarding the 1950 census industry classification. To concord the trade data to the 1990 census industry classifications discussed above, we must concord from 1950 to 1990 census industry. We merge all census industry files containing both of these categories from 1950-1990 and construct weights between these occupations based on the total proportion of employment found in each pairs across these samples.

We provide descriptive statistics for our county labor market shock here.

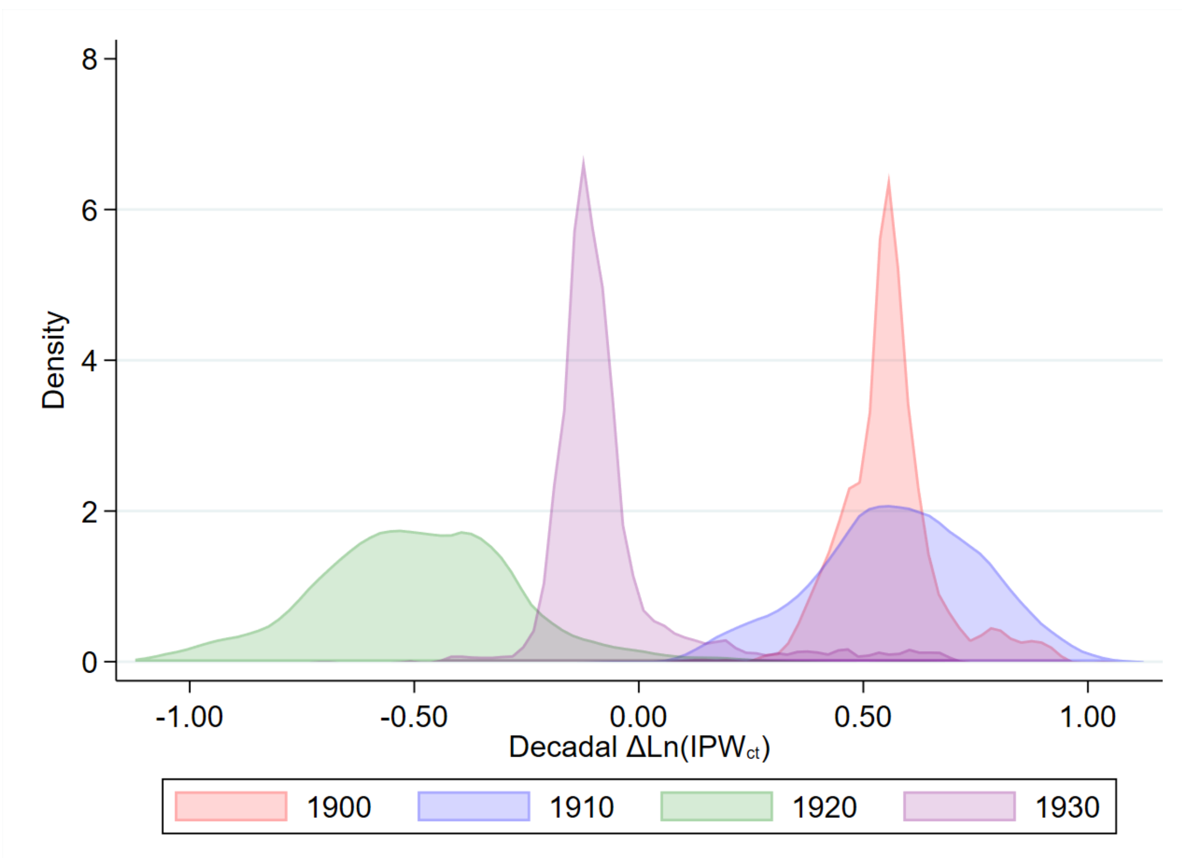
In figure D4 we display the distribution of our shift share shocks by decade. As is clear from the figure, these county level shocks match our aggregate import growth patterns: 1900-1920 was characterized by import growth, while 1920-1940 experienced a contraction, though county level experiences differed substantially.

Table D1: Descriptive Statistics for Labor Market Analysis

	1900	1910	1920	1930	Total
$\Delta Ln(\widehat{IPW_{ct}})$	0.504	0.530	-0.413	-0.063	0.085
	(0.104)	(0.181)	(0.219)	(0.135)	(0.424)
ΔRP_{ct}	-0.029	-0.666	0.185	-0.093	-0.139
	(0.006)	(0.178)	(0.106)	(0.032)	(0.325)
$\Delta \frac{Labor_{ct}}{Population_{ct_0}}$	0.011	-0.014	0.007	-0.037	-0.011
	(0.021)	(0.035)	(0.043)	(0.031)	(0.039)
$\Delta Ln(Income_{ct})$	-0.006	0.026	0.028	0.021	0.019
	(0.051)	(0.039)	(0.039)	(0.040)	(0.044)
ΔRP_{cit}	-0.086	-0.759	0.478	0.078	-0.039
	(0.037)	(0.203)	(0.271)	(0.077)	(0.478)

Notes: Table reports summary statistics for key dependent and explanatory variables by decade and overall. Variable mean stacked above variable standard deviation (in parenthesis). As with regressions, summary statistics are weighted by start of decade county population.

Figure D4: Kernel Density of Import Exposure by Decade



Notes: Figure displays kernel density of county log changes in imports per worker by decade.