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

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February 10, 2022

First Draft: January 2021

Abstract

Specific tariffs feature prominently in US trade policy. As price levels change, they generate quasi-random variation in tariff levels *within* endogenously determined trade policy regimes. We measure these intra-policy tariff changes with a newly digitized database encompassing the universe of tariff lines across all five US trade policy regimes from 1900-1940. We show that price dynamics combined with industry reliance on specific tariffs generate substantial changes in tariff protection across industries and ultimately cause large swings in average industry tariff levels – up to 6.5 percentage points in five years. We leverage this variation to estimate the effect of changes in tariff protection on import growth and of import growth on local labor markets. At the industry level, we show that these changes in US tariff protection are strongly predictive of US import growth but not predictive of UK import growth. Across labor markets, we show that import growth slows a county's transition from agriculture to manufacturing. The effects of import growth fall most heavily on those with little experience or fewer outside labor market options: the young, seniors, and those in rural areas.

Keywords: Trade Policy, International Trade, Economic History, Inflation, Labor Markets

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

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*We thank Mario Crucini, Rafael Dix-Carneiro, Dave Donaldson, Jackson Howell, Beata Javorcik, James Lake, Peter McHenry, Emily Moschini, Peter K. Schott, Brandon Sheridan, and Tom Zylkin for helpful suggestions and discussions of this draft. We also thank seminar participants at the ETOS, Southern Economic Association Annual Meetings, Southern Methodist University, T.E.A.M., University of California - Davis, University of Hawaii, and University of Massachusetts - Lowell. All errors are our own. We gratefully acknowledge the Upjohn institute for their support of this research through an ECRA grant.

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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. Changing trade flows create variation in economic conditions across industries, firms, and workers, 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 side 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 provide evidence of the effects of trade on US labor markets in a unified framework 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 effect on domestic outcomes. We propose an identification strategy for such settings that exploits unexpected changes in realized tariff 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 remains constant. Thus, pre-existing differences in the prevalence of specific tariffs across industries in conjunction with subsequent price variation generates quasi-random variation in realized tariff protection over time *within* a trade policy regime. Due to the unpredictability of price movements over time, these changes are plausibly independent of the demand for protection.

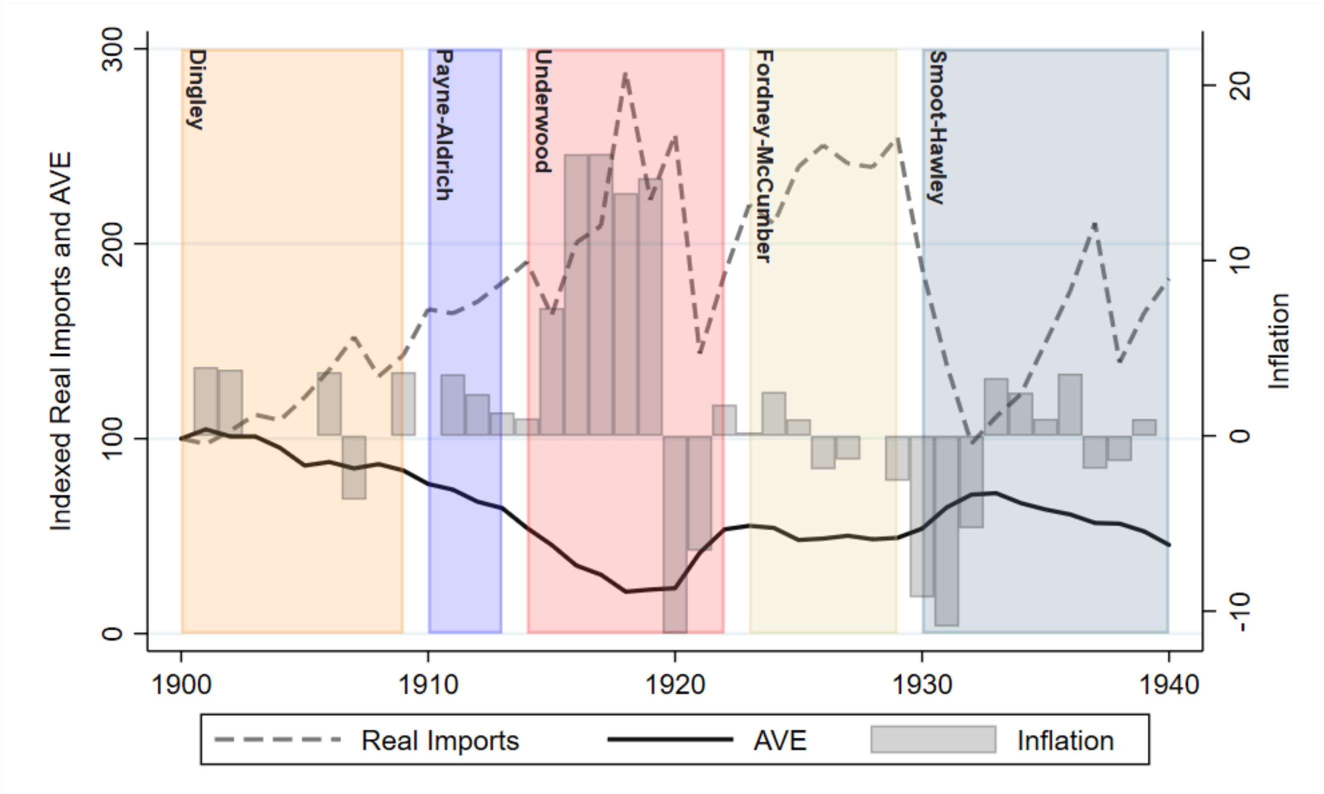
We present visual of evidence of the mechanism employed in the paper in Figure 1. Here, each of the five distinct U.S. trade policy regimes of the early 20^{th} century is represented by a

[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 pioneering 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; Pierce and Schott, 2016; Handley and Limao, 2017; Kovak, 2013; Hakobyan and McLaren, 2016; McCaig and Pavcnik, 2018) study sweeping liberalizations in which the magnitude of the industry level tariff change is plausibly unaffected by political lobbying.

distinct colored vertical band.[3] The dashed line represents annual real imports indexed to the

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



Notes: AVE and Import values from the USITC. Real imports and AVE indexed to 100 in 1900. Vertical bands indicate the years encompassed by Dingley Tariff of 1897, the Payne-Aldrich Tariff of 1909, the Underwood Tariff of 1913, the Fordney-McCumber Tariff of 1922, and the Smoot-Hawley Tariff of 1930 respectively.

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 the non-policy variation in the AVE tariff rate across years *within* a given policy regime. This within-regime variation is strongly and negatively correlated with inflation rates, depicted by gray bars. Periods with high inflation tend to be periods with low

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

[4]Trefler (1993), deals with endogenous trade policy directly by simultaneously estimating the demand for protection in conjunction with the effects of protection on imports. Our approach, by contrast, takes protection as given and attempts to identify variation in tariffs that is independent of the demand for protection.

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 capture this intuition 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 1940. 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 in agricultural products, specific tariffs are ubiquitous in our sample. They account for more than 70% of all duties collected in the first year of our sample, dropping to 46% in the 1920s and returning to 67% with the the Smoot-Hawley tariff in 1930.

When combined with price variation, specific tariffs generate substantial variation in realized protection over time within trade policy regimes. For example, between 1915 and 1920, when industry inflation reaches its in-sample peak, we observe a 6.5 percentage point reduction in ad valorem equivalent (AVE) tariffs due to the presence of specific tariffs. Conversely, as prices plummet between 1925 and 1930 the average industry AVE increases by 3.2 percentage points. The overall variation we document is large: Across our whole 40-year sample, the standard deviation of *annual* changes in realized protection amounts to a 1.5 percentage point change in the AVE when using industry-level prices and 1 percentage point change when using aggregate prices.

After describing our data we evaluate the predictive capacity of our approach in two applications. In the first, we estimate the effect of changes in realized protection on industry import growth over five and ten year intervals. We find that a one standard deviation increase in realized protection decreases industry import growth by between one half and three quarters of a standard deviation. These effects are roughly 20% smaller in the short run (five years) versus the long run (10 years), though they are always statistically significant and economically meaningful.[5] These results obtain

[5] Such differences have been noted previously. See, for example, Ruhl (2008) and Boehm et al. (2020).

even after accounting for initial levels of protection as well as initial 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 (Bartik, 1991; Borusyak et al., 2020) design in which we instrument for county-level log import growth with an employment-weighted average of industry-level changes in realized protection. We find that increasing import exposure leads to reductions in labor force participation and occupational income scores. The bulk of these effects are concentrated on those with little ability to adjust – both younger and older groups, and those that live in rural areas. Import competition also retards manufacturing employment growth, primarily in favor of agriculture. This suggests a potential role for import competition in shaping the evolution of the US economy over space and time.

Our strategy faces two primary identification concerns. The first is that our results may reflect other channels through which changing price levels differentially affect industry imports. If demand rises disproportionately for goods relying on specific tariffs during expansionary periods, for instance, this would mimic the mechanism we have in mind but would not be causally linked to changing tariff protection.[6]

To evaluate this concern we conduct two placebo exercises. First, we construct an analogous import database to examine the relationship between changes in US tariff protection and UK industry imports. If changes in price levels disproportionately impacted 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 rising prices, but not UK imports. Second, we construct an additional import database to examine trade dynamics in the US from 1848 to 1861, during which time US trade policy featured no specific tariffs.[7] We find that specific tariffs introduced in 1861 by the Morrill Tariff 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, that govern the differential response we observe.[8]

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

[7] The Walker Tariff of 1846 eliminated all specific duties in the US tariff code, leaving only ad valorem tariffs in place. This persisted for 15 years, until the Morrill Tariff of 1861 reintroduced specific tariffs.

[8] Separately, we show that our results are robust to exploring heterogeneous responses across regions, suggesting

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 have chosen a particular combination of ad valorem and specific duties in anticipation of subsequent changes in realized protection. While it is likely that omitted variables such as political influence or expected wage growth affect average tariff levels, their correlation with intra-policy *changes* in tariff protection is less clear. The relative change in protection reflects the direction of price changes; endogenous trade policy along this dimension would thus require an accurate forecast of future aggregate 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 driver of our results. First, we document the inherent difficulty in forecasting inflation during this period. Crediting turn-of-the-century politicians with the ability form inflation expectations using dynamic AR forecasts, we show that realized price growth differs substantially from these expectations. While its possible that they would choose a mix of ad valorem and specific tariffs with an eye toward future prices, they would hardly be able to implement their preferred policy with surgical precision. Second, we document the extreme persistence of industry reliance on specific tariffs. As late as the Smoot-Hawley tariff, industry specific tariff shares are strongly predicted by the industry structure specific tariffs under the Morrill Tariff of 1861. This suggests that reliance on specific tariffs in our main 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 (1998), who argue that intra-policy variation in the ad valorem equivalent tariff rate is considerable, and is related to both specific tariffs and inflation. Relatedly, Bond, Crucini, Potter, and Rodrigue (2013) and Harrison (2018) analyze the effects of specific tariffs on productivity and prices for a subset of products surrounding the Smoot-Hawley tariff. We extend the existing work along several important margins.[9] First, we expand coverage of duties at a highly disaggregate level to cover the universe

that our results are not driven by the behavior of geographically-clustered sets of industries.

[9]Less directly, we also connect to work emphasizing the importance of per unit trade costs (Hummels and Skiba,

of imports for a 40 year period. This allows us to explore the effects of evolving protection during a sample spanning the first wave of globalization as well as the subsequent rise in protectionism and interwar trade collapse rather than focusing on a single policy event. Second, we provide direct evidence of the relationship between inflation and trade in the presence of specific tariffs and rule out alternative explanations via placebo analysis. Finally, we provide the first evidence of the spatial incidence of trade on labor market outcomes in a unified setting during this period.

We also contribute to the small but growing literature on the spatial effects of globalization in historical contexts. Eriksson et al. (2021) employ a shift-share approach to detail the evolution of import exposure over time in the U.S. and emphasizes the importance of skill in combination with product cycles to explain differential responses to the "China Shock." Candia and Pedemonte (2021) explore the effects of exchange rate shocks on exporting and economic activity in 200 cities in the U.S. surrounding the Great Depression. Aside from focusing on imports rather than exports, our method provides a tractable measure of changes in import competition over multiple trade policy regimes and offers coverage of the entire U.S. 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 via their impact on innovation and productivity in the in the turn of the 20^{th} century US. Additionally, in ongoing work parallel to this, we use the measure developed here to estimate the effect of import competition on Congressional elections and voting on trade bills during the early twentieth century (Greenland, Howell, and Lopresti, 2021).

Finally, we contribute 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 reliant on discrete changes in trade barriers (Topalova, 2007; Kovak, 2013; Caliendo and Parro, 2015; Dix-Carneiro, 2016; Hakobyan and McLaren, 2016; Caliendo et al., 2022; Alessandria et al., 2021) or policy-specific institutional details (Khandelwal et al., 2013; de Bromhead et al., 2019; Fajgelbaum et al., 2020; Flaaen and Pierce, 2021; Lake and Liu, 2021; Cox, 2022) for identification. Due to the proliferation of liberalization episodes in recent years, these papers are largely focused on post-

2004; Eaton et al., 2014).

1990 events.[10] Our contribution to this literature is twofold. First, we provide evidence on the effects of trade policy in a distinct setting. Second, we construct a measure of exogenous changes in trade exposure that allows researchers to quantify the effects of trade policy across multiple policies simultaneously – even when barriers reflect the demand for protection.

The paper proceeds as follows. In section 2 we derive a simple measure of specific-tariff-induced variation in realized 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 protection. In Section 4 we estimate the effect of changes in realized tariff 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, occupational income scores and other labor market outcomes. We additionally explore heterogeneity across demographic groups. Section 6 outlines additional applications for our approach and concludes.

2 Empirical Approach: Inflation and Effective Trade Protection

Trade barriers 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 economic outcomes are endogenously linked in a way that limits the usefulness of tariffs as a source of identifying variation. Here, we describe an approach that identifies plausibly exogenous variation in the protection afforded by a given tariff code by exploiting the structure, rather than the level of tariffs.

To fix ideas, suppose that at time t_0 politicians set policy by selecting some combination of ad valorem, τ_v, and specific (per unit) 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 price levels p_{vt_0}, politicians can achieve identical levels of protection

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

with an infinite combination of τ_v and f_v. The particular combination chosen for good v generates what we refer to as its "specific tariff share", or

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

Intuitively, STS_{vt_0} represents the proportion of total 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 log of one plus the ad valorem equivalent, $Ln(1 + \tau_v + \frac{f_v}{p_{vt_0}})$. This equals the log price of a domestic good relative to a foreign one. This will change differentially over time within a trade policy regime as the price level exclusive of trade costs changes. To see this, differentiate $Ln(1 + \tau_v + \frac{f_v}{p_{vt_0}})$ and note that within a policy regime $\partial\tau_v$ and ∂f_v are zero by definition. The change in the log price of good v is then:

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

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

As it it likely that politicians choose initial AVE levels as a function of expected future import growth, we omit the final term from equation 3 and exploit only the quasi-random variation driven by specific tariffs and price changes. We refer to this measure realized protection:

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

This measure is plausibly independent of demand for protection, but will impact the level of protection a good receives, making it a suitable instrument for import growth.[11] In section 4 we demonstrate the predictive capacity of this measure over industry import growth and address residual identification concerns at that time. In section 5 we use ΔRP_{vt} as an instrument for import growth to assess the impacts of import competition on labor markets.

Having outlined our empirical framework. We now turn to detailing the policy environment and our data sources and constructing our measure of exposure. We defer discussion of residual identification concerns until our empirical applications.

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.[12] 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.[13]

Our identification comes from changes in realized tariff protection driven by cross-industry variation in reliance on specific tariff shares and temporal variation in price levels. To operationalize

[11] More formally, ΔRP_{vt} captures the percent change in the initial level of protection AVE_{vt_0} rather than the percent change in the price of a foreign variety relative to a domestic variety.

[12] Due to its short duration, we ignore the emergency Tariff act of 1921 which was replaced by September of the following year.

[13] 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 1903-1940 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 will be able to focus on the entire set of imported goods and duties in each of these policy regimes.

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* every five years from 1900 until 1930 and the *Statistical Abstract of the United States* 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.[14] To allow for mapping to more aggregate employment data, manually concord each product to its 2-digit Standard International Trade Classification (Revision 2) counterpart.[15]

To provide a sense of the cross-policy variation present in our sample, we present aggregate policy-level ad valorem equivalent 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	0.26	0.69	33	2114
1905	Dingley	0.22	0.68	33	2364
1910	Payne-Aldrich	0.22	0.58	34	3781
1915	Underwood	0.12	0.38	34	2404
1920	Underwood	0.07	0.44	34	2585
1925	Fordney-McCumber	0.13	0.58	34	5072
1930	Smoot-Hawley	0.15	0.59	34	4601
		Panel B: 1848-1861			
1848	Walker	0.22	0.00	31	330
1861	Morrill	0.16	0.76	30	419

Notes: AVE_t and STS_t are value weighted averages of 1 and 2. Industries are a slight aggregation of 2-digit SITC REV-2 industries to facilitate comparison over policy regimes and are detailed in Appendix A. Data digitized from the Foreign Commerce and Navigation of the United States – detailed sources can be found in Appendix tables A1 for 1900-1940 and in table C5 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 26%, then declines somewhat to 22% with the implementation of the Payne-Aldrich Act of (1909) before plummeting to 7% with 1913's Underwood 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

[14] 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 may be found in Figure A1.

[15] We aggregate slightly to facilitate matching across years and data sources. This aggregation is detailed in full in Appendix A.

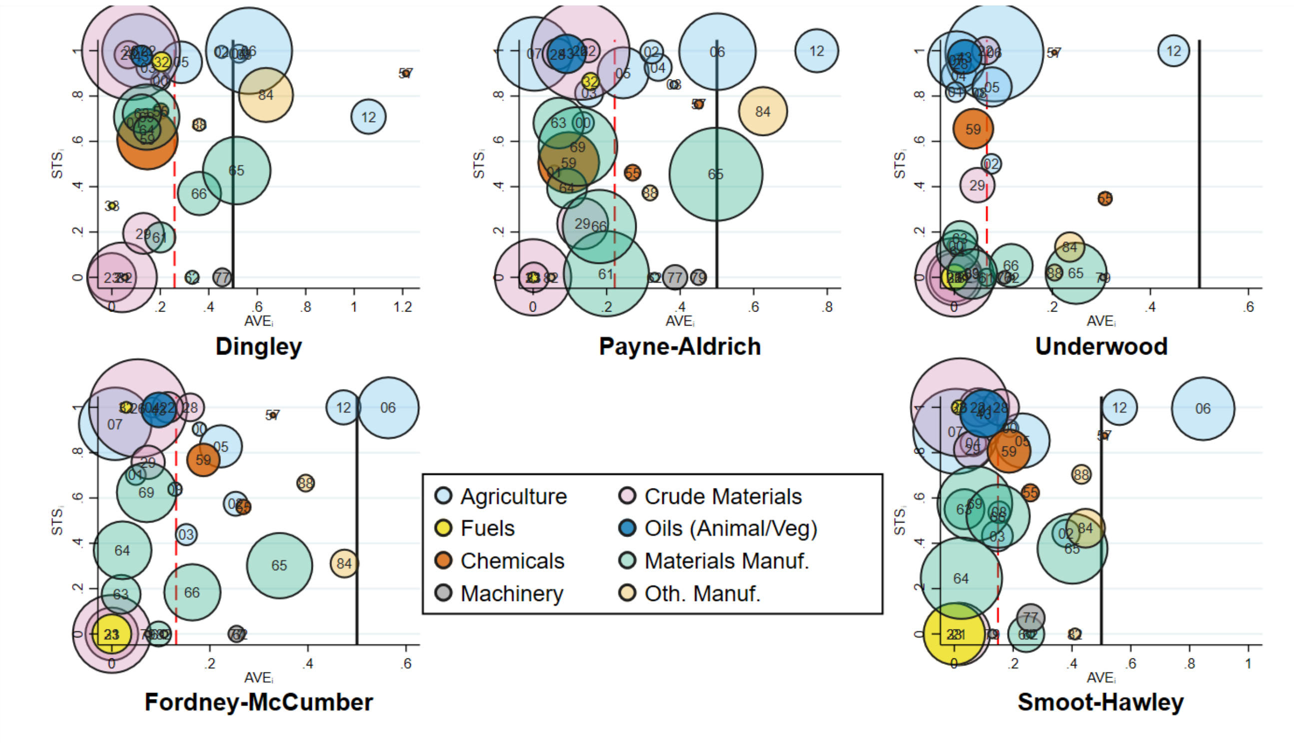
feature prominently across all policy regimes. Save for the Underwood Tariff era in 1915 and 1920, the share of tariff revenue generated by specific tariffs never falls below half. At its lowest point, in 1915, specific tariffs still generate 38% of all tariff revenue.

However, specific tariff were not always so widely used as a trade policy tool. For a 15-year period governed by the Walker Tariff of 1846, specific tariffs were wholly absent from US trade policy. They were re-introduced into US trade policy 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 will use data from these two policy settings in placebo and robustness exercises.[16] As such, we digitize tariff-line data on trade flows, tariffs, and tariff type from 1848 to 1861.[17] 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. There is substantial persistence in industry reliance on specific tariffs, such that specific tariff shares in our primary sample are highly correlated with those specified by the Morrill tariff. We return to this point in detail in section 4 below.

While the cross-policy variation in *AVE* tariffs highlighted above is important, our identification strategy does not require it. Instead, it is the cross-industry differences in the prevalence of specific tariffs that offers 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 1940.[18] Each circle reflects an SITC industry, with a size proportional to its share of real imports. On the horizontal axis we plot the *AVE* tariff 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.

[16]The Tariff of 1857 was enacted during this period as well, but it too featured no specific duties.
[17]These data are detailed extensively in Appendix C.
[18]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.

Figure 2: Industry level STS_i versus AVE_i by Policy Regime



Notes: Figure displays the Specific Tariff Share (STS_i) versus the Ad Valorem Equivalent (AVE_i) for each trade policy regime. 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-level Ad Valorem Equivalent Tariff.

Though it needn't be the case, the AVE_{vt} and STS_{vt} are weakly positively correlated under each policy regime.[19] 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 6) 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 effective rate of protection for textiles remains much higher during the subsequent decade than that of sugar, despite the fact that they share the same average initial tariff level. This variation allows us to identify outcomes through changes in realized protection while controlling for the initial AVE tariff.

[19]These range from 15.4% under the Underwood Tariff to 24% under the Payne-Aldrich Act.

We note that even as AVE tariffs change across policies, industry specific tariff shares are highly persistent. We 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 range.[20] Cross-policy correlation in industry specific tariff shares never falls below 0.66.[21]

3.1 Prices, 1900-1940

To construct our measure of realized protection, we need price data in addition to the tariff and import data described above. Our identification strategy requires that the relationship between price increases 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 collect price data from two non-US sources.

In our baseline results we use the United Kingdom consumer price index, which we obtain from the Jordà-Schularick-Taylor Macrohistory Database.[22] To the extent that aggregate UK price levels are correlated with US prices but are not driven by US industry-specific demand shocks, the UK CPI offers suitable price variation. The drawback of this measure is that it ignores any industry-level price variation. Within-period variation in our measure of realized protection is thus solely driven by cross industry-differences in the specific tariff share. If industry price growth is non-uniform, then our industry-level measure realized protection will be measured with error.

To address this shortcoming, we construct a second measure of price growth by digitizing annual UK product-level import values and quantities from 1900-1938.[23] As with our US sample, we manually concord this data to the two digit SITC revision 2 classification, and construct industry price growth from import unit values.[24] The industries for which we are able to construct prices cover 98.5% of the value of US imports in our sample. For industries in which we are unable to

[20] Because our sample spans US Prohibition, we drop SITC 11 which is comprised primarily of alcohol. See Harrison (2018) for a detailed discussion of cross-industry variation in reliance on specific tariffs during the Smoot-Hawley era in particular.

[21] We report a correlation matrix of industry specific tariff shares across policy regimes in appendix table 5.

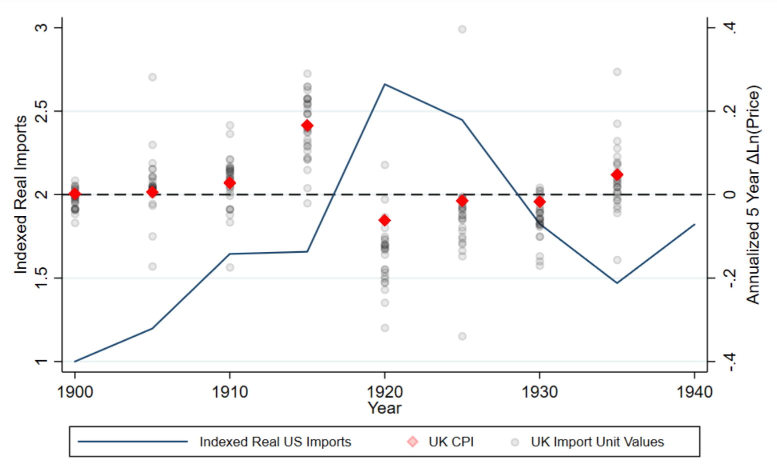
[22] http://www.macrohistory.net/data/

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

[24] We detail our sources and price construction in Appendix section B.

construct a price measure due to inadequate data, we utilize the aggregate UK CPI.[25]

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



Notes: Indexed real US imports 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 while the circles reflect in 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.

Figure 3 displays the evolution of price levels throughout our sample, as well as US aggregate real imports. Here we present annualized 5 year changes in both the aggregate UK CPI as well the industry level UK import prices discussed above. 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 aggregate.

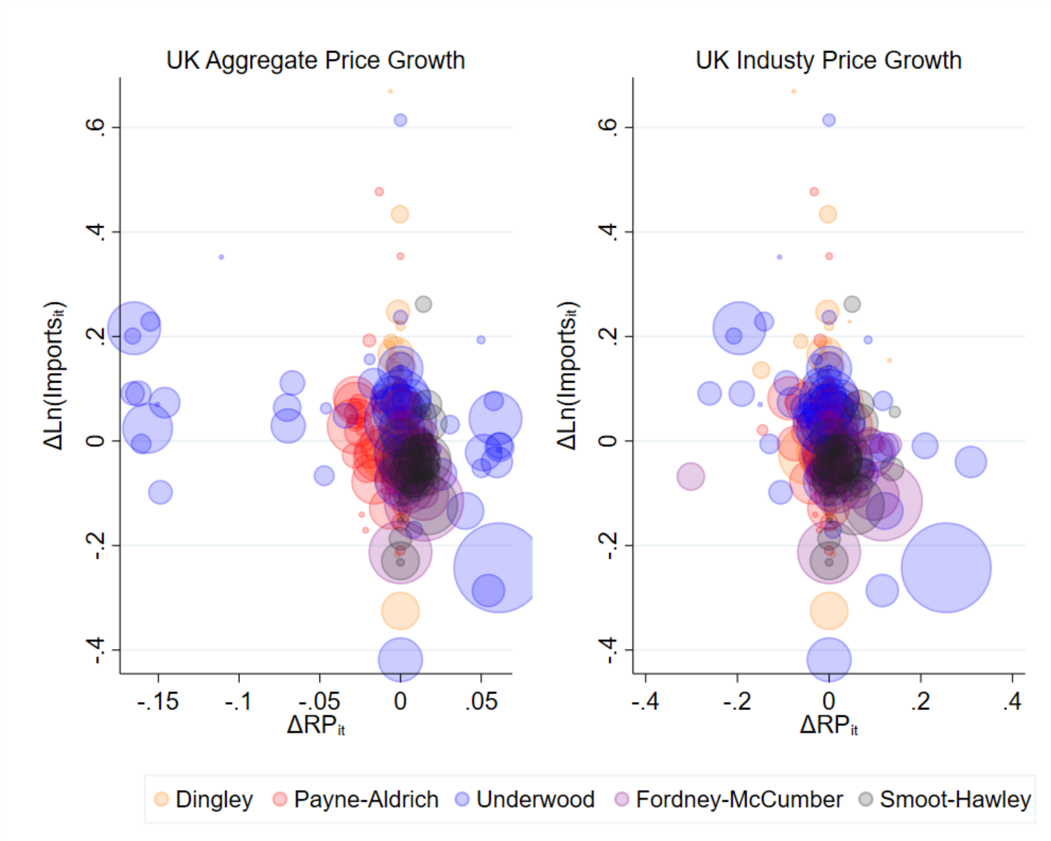
4 US Import Growth and Changes in Realized Protection

We now turn to characterizing the relationship between changes in realized protection and import growth at the industry level. We begin by presenting visual evidence of the relationship between

[25]As a further robustness exercise, we also construct prices from a "rest of world" index based on inflation in Australia, Canada, Denmark, France, Italy, Japan, the Netherlands, Norway, Spain, Sweden, Switzerland, and the United Kingdom in the Jordà-Schularick-Taylor data. 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 U.S. 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.

changes in log real imports and changes in realized protection (defined in equation 4) using the two price measures described above.[26]

Figure 4: Annualized Changes in Industry Imports vs ΔRP_{it}.



In the left panel of Figure 4 we plot annualized 5-year log real import growth against the 5-year change in realized protection, utilizing the UK CPI for price variation. In the right panel of the figure we display the 5-year changes in log imports against the change in realized protection that leverages industry level changes in unit values. In each case the pattern is clear: within and across policy regimes, rising prices lead to falling protection, which is associated with increasing imports.

More formally, we estimate our baseline regression, in which we relate annualized changes in

[26]Imports have been deflated by the US CPI

import growth to annualized changes in realized protection as

$$\Delta Ln(Imports_{it}^{US}) = \beta_0 + \beta_1 \Delta RP_{it} + \Gamma X_{it_0} + \eta_t + \epsilon_{it} \quad (5)$$

$$\Delta RP_{it} \equiv - \Delta Ln(p_{it}) STS_{it_0}. \quad (6)$$

We estimate this model over 10-year and 5-year windows employing both aggregate UK and industry level UK prices. Regressions are weighted by start-of-period real industry imports and standard errors are clustered at the SITC 2-digit level. We present our findings in Table 2, sequentially introducing controls across columns.

In Panel A we report results for 10-year changes, which corresponds to the timing of our labor market specifications below. In column 1, which uses the aggregate UK price index to construct ΔRP_{it}, we include only time fixed effects as controls. As expected, rising protection is associated with falling imports. The effect is statistically significant at conventional levels and economically meaningful. A one-unit standard deviation increase in ΔRP_{it} is associated with a 0.77 standard deviation reduction in import growth.[27] In column 2, we condition on the initial AVE_{it_0} level to account for any differential response among goods with different levels of protection. This measure provides little explanatory power and has no impact on our coefficient of interest. In column 3 we include the initial industry STS_{it_0} to account for the concern that pre-existing differences in reliance on specific tariffs may be related to subsequent import growth. This leaves our primary result unchanged.

In columns 4 through 6, we use industry-level price variation to construct our measure of ΔRP_{it}. In addition to time fixed effects, we now control for the direct effect of changes in prices on imports directly. Again, the relationship is negative and strong: the results in column 4 imply that a one standard deviation increase in realized protection leads to a 0.81 standard deviation decrease in imports. This result is significant at the 1% level. Neither the addition of the start-of-period ad valorem equivalent in column 5, nor the addition of the initial specific tariff share in column 6 affects this finding.

Panel B replicates this analysis using 5-year changes in imports and analogous measures of

[27]The standard deviation of 10-year changes in realized protection from the UK CPI is 0.034 and .067 using industry prices. While a 1 standard deviation increase in annualized 10 year log import growth is 0.077.

Table 2: US Import Growth and ΔRP_{it}^{US}

	Panel A: 10-Year $\Delta Ln\left(Imports_{it}^{US}\right)$					
ΔRP_{it}	-1.661**	-1.674**	-1.702**	-0.930***	-0.929***	-1.098***
	(0.706)	(0.715)	(0.719)	(0.244)	(0.246)	(0.299)
AVE_{it_0}		-0.017	-0.012		-0.010	-0.025
		(0.029)	(0.027)		(0.025)	(0.026)
STS_{it_0}			-0.016			0.043
			(0.027)			(0.026)
$\Delta Ln(P_{it})$				-0.207	-0.202	-0.270
				(0.197)	(0.202)	(0.194)
Obs.	135	135	135	135	135	135
R^2	0.375	0.372	0.374	0.466	0.462	0.500
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Price Growth	UK_t	UK_t	UK_t	UK_{it}	UK_{it}	UK_{it}
SITC-2 Industries	34	34	34	34	34	34
	Panel B: 5-Year $\Delta Ln\left(Imports_{it}^{US}\right)$					
ΔRP_{it}	-1.061*	-1.047*	-1.073*	-0.517**	-0.518**	-0.563**
	(0.569)	(0.562)	(0.579)	(0.251)	(0.252)	(0.267)
AVE_{it_0}		0.036	0.044*		0.030	0.021
		(0.023)	(0.024)		(0.029)	(0.022)
STS_{it_0}			-0.020			0.021
			(0.032)			(0.024)
$\Delta Ln(P_{it})$				0.239	0.232	0.221
				(0.188)	(0.188)	(0.186)
Obs.	236	236	236	236	236	236
R^2	0.209	0.209	0.210	0.306	0.305	0.307
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Price Growth	UK_t	UK_t	UK_t	UK_{it}	UK_{it}	UK_{it}
SITC-2 Industries	34	34	34	34	34	34

Notes: Dependent variable is annualized log change in US industry imports constructed from 10-year changes in panel A and 5 year changes in Panel B. 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 1-2 and UK industry import unit values in columns 3-4. All regressions are weighted by start of period import values. Standard errors clustered at 2-Digit SITC level and reported in parenthesis. *, **, *** indicate $p < .1$, $p < .05$, $p < .01$ respectively.

price growth. Here too, we observe a significant, negative, and economically meaningful effect. The estimate in column 1 implies that a one standard deviation increase in realized protection leads to a 0.44 standard deviation decrease in import growth at the industry level. In in column 6 a similar change in realized protection amounts to a 0.41 1 standard deviation decrease 5-year import growth.[28] Notably these effects are smaller in magnitude than those in the upper panel, consistent with the idea that imports respond to price-driven changes in trade costs more over time.

[28]The standard deviation of 5-year changes in imports growth is 0.111. The standard deviation of changes in realized protection is 0.041 using when measured with aggregate prices and and 0.08 when relying on industry prices.

4.1 A Dual Placebo Exercise: UK Imports and The Morrill Tariff of 1861

The preceding results document a differential response to changes in prices among industries reliant on specific tariffs. While we have argued that this is driven by changes in legislated protection as price levels changes, there are alternative explanations. First, industries that rely on specific tariffs might be more responsive to price changes than 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 any other study using AVE tariffs as a source of identification. We consider each of these possibilities in turn.

UK Import Growth and Changes in US Realized Protection

We begin by exploring analogous results to those described above in a separate market, namely the UK. Given the differences in tariff codes between the two markets, UK imports are not subject to the same changes in realized *US* 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 our preceding analysis in that setting.[29]. Specifically, we regress both 10-year and 5-year changes in UK industry log imports between 1900 and 1940 on changes in *US* realized tariff protection. As before, standard errors are clustered at the SITC-2 industry. Regressions are weighted by start of period UK real imports. The results of this specification are presented in Table 3.

The contrast in results across the two markets is stark. The columns follow the same pattern as the one described in Table 2. Columns 1 through 3 include the change in realized protection using

[29] Details of these data may be found in Appendix B

Table 3: UK Import Growth and ΔRP_{it}^{US}

	Panel A: 10-Year $\Delta Ln\left(Imports_{it}^{UK}\right)$					
ΔRP_{it}	-0.073	-0.079	-0.027	0.087	0.084	0.063
	(0.302)	(0.305)	(0.355)	(0.186)	(0.194)	(0.167)
AVE_{it_0}		-0.009	-0.010		-0.031**	-0.032**
		(0.011)	(0.010)		(0.012)	(0.012)
STS_{it_0}			0.012			0.007
			(0.021)			(0.013)
$\Delta Ln(P_{it})$				0.520***	0.545***	0.529***
				(0.147)	(0.149)	(0.126)
Obs.	120	120	120	120	120	120
R^2	0.261	0.255	0.258	0.418	0.425	0.423
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Price Growth	UK_t	UK_t	UK_t	UK_{it}	UK_{it}	UK_{it}
SITC-2 Industries	32	32	32	32	32	32
	Panel B: 5-Year $\Delta Ln\left(Imports_{it}^{UK}\right)$					
ΔRP_{it}	0.153	0.148	0.110	-0.027	-0.038	-0.037
	(0.197)	(0.195)	(0.201)	(0.061)	(0.063)	(0.063)
AVE_{it_0}		-0.017	-0.015		-0.037	-0.036
		(0.027)	(0.030)		(0.025)	(0.026)
STS_{it_0}			-0.010			-0.002
			(0.012)			(0.011)
$\Delta Ln(P_{it})$				0.571***	0.575***	0.574***
				(0.057)	(0.057)	(0.059)
Obs.	211	211	211	211	211	211
R^2	0.177	0.175	0.174	0.423	0.428	0.425
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Price Growth	UK_t	UK_t	UK_t	UK_{it}	UK_{it}	UK_{it}
SITC-2 Industries	32	32	32	32	32	32

Notes: Dependent variable is annualized log change in UK industry imports constructed from 10-year changes in panel A and 5 year changes in Panel B. 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 1-2 and UK industry import unit values in columns 3-4. All regressions are weighted by start of period import values. Standard errors clustered at 2-Digit SITC level and reported in parenthesis. *, **, *** indicate $p < .1$, $p < .05$, $p < .01$ respectively.

the UK CPI while columns 3-6 use UK industry import unit values. UK import growth is not related to changes in realized protection, measured using US specific tariff shares, in any specification. This is true in both 10-year and 5-year changes. Indeed, the direction of the relationship is incorrect in 6 out of the 12 specifications. Thus, changes in realized protection predict import growth in the US, but not the UK, suggesting that unobserved product-specific characteristics do not drive our results.

The Morrill Tariff of 1861

As a second placebo, we turn our attention to a separate 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.[30] If industries that rely on specific tariffs do indeed 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 *Foreign 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 all of these data to the 2-digit SITC level and deflate them using the US CPI.[31] For each industry, we calculate the ad valorem equivalent and specific tariff share under the Morrill Tariff. Using the UK wholesale producer price index to measure inflation, we then calculate *pseudo* changes in realized protection between 1848 and 1860 from the yet-to-be-enacted Morrill Tariff.[32] Finally, we estimate the relationship between industry import growth and these pseudo changes in realized protection as follows:

$$\Delta Ln(Imports_{0ti}) = \beta_0 + \beta_1 \Delta RP_{it}^{Morrill} + \beta_2 AVE_i^{Morrill} + \eta_t + \epsilon_{it} \tag{7}$$

with

$$\Delta RP_{it}^{Morrill} \equiv -\Delta Ln(p_t) STS_i^{Morrill} \tag{8}$$

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 these industries respond differentially to price shocks independently of the primary channel we propose above, we would expect the coefficient to be negative and significant.

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

[31] Product classifications are detailed in A and details on the import and tariff data from this period are documented in section C.

[32] We use the UK PPI as trade data is 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.

Table 4: Industry Import Growth: Morrill Tariff Placebo Analysis.

	(1) $\Delta Ln(Imports_i^{US})$	(2) $\Delta Ln(Imports_i^{US})$	(3) $\Delta Ln(Imports_i^{US})$	(4) $\Delta Ln(Imports_i^{US})$	(5) $\Delta Ln(Imports_i^{US})$
$\Delta RP_{it}^{Morrill}$	0.106	2.360***	0.192	1.249	1.367
	(0.663)	(0.364)	(0.782)	(0.891)	(0.997)
AVE_i^{Morril}	-0.076	-0.137	-0.120	-0.059	-0.122
	(0.110)	(0.142)	(0.152)	(0.089)	(0.142)
Δt	1-year	2-year	3-year	4-year	6-year
Panels	12	6	4	3	2
N	348	173	114	86	56
R^2	.191	.154	.043	.052	.153
Price Index	UK PPI	UK PPI	UK PPI	UK PPI	UK PPI
Time FE	Yes	Yes	Yes	Yes	Yes
Period	1848-1860	1848-1860	1848-1860	1848-1860	1848-1860

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 yet to be enacted Morrill Regime specific tariffs – given by equation 7. Annualized changes in price levels are based on the aggregate UK PPI. Columns differ in duration of changes and number of panels. Regressions weighted by start of period import share. Standard errors clustered at 2-Digit SITC level and reported in parenthesis. *, **, *** indicate $p < .1$, $p < .05$, $p < .01$ respectively.

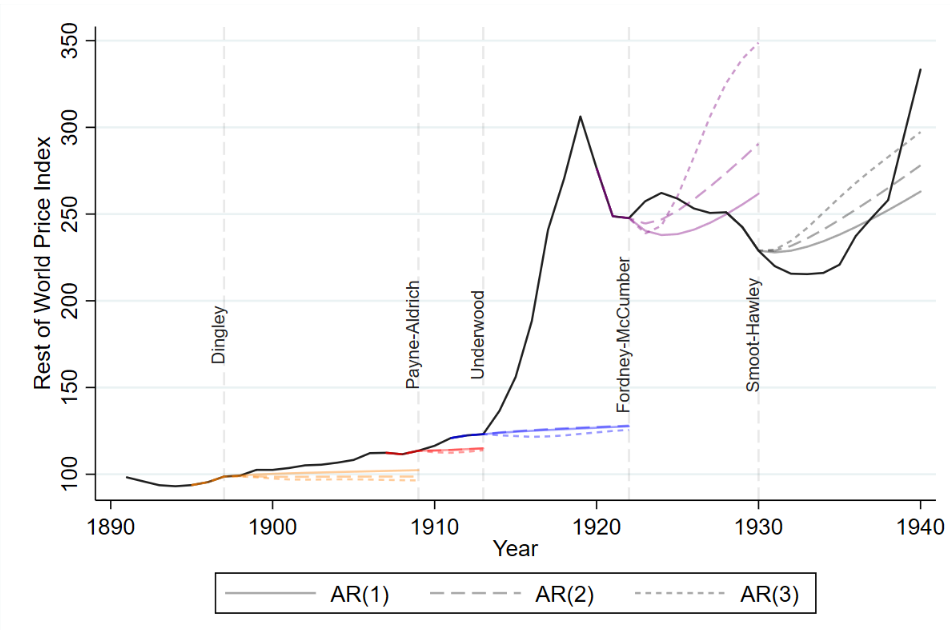
Making full use of the 12-year sample, we estimate this model using 1-, 2-, 3-, 4-, and 6-year changes log industry imports and analogous pseudo changes in realized protection. As before, standard errors are clustered at the 2-digit SITC level. All variables are annualized to facilitate comparison with previous tables. Results can be found in Table 4. Across all specifications, β_1 is never significantly negative. 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.

4.2 Are Specific Tariff Shares Chosen Based on Expected Inflation?

A final threat to our identification is the possibility that changes in realized protection are endogenously related to import growth. In our setting this would be feasible if the use of specific tariffs were determined jointly with an inflation forecast. That is, while we treat changes in realized protection as unexpected, if politicians had anticipated subsequent price movements, our measure would be subject to the same concerns that invalidate relating imports to tariff levels. For example, powerful industries might prefer high levels of specific tariffs if expecting deflation and low levels of specific tariffs if anticipating inflation. To address this concern we take two steps. First we evaluate the feasibility of price forecasting during our sample. Second, we evaluate whether industry specific tariff shares change in anticipation of price level changes.

We begin with a simple exercise to demonstrate the impracticality of price forecasting during our sample. Given the substantial variation in price levels exhibited during our sample, as highlighted in Figure 1, politicians would need to correctly anticipate not just a consistent level of inflation, but also abrupt bouts of deflation. To further emphasize this point, we explore how well a simple price forecast matches subsequent price growth in our sample. In Figure 5 we present forecasts of a rest-of-world price index at the onset of each new policy.

Figure 5: "Anticipated" Price Changes Between Policy Regimes



Notes: Forecast series constructed from AR(1), AR(2), and AR(3) models respectively using the prior 30 years of annual rest of world inflation data.

Specifically, we estimate an auto-regressive model of log price growth based on 30 years of data prior to each trade policy regime.[33] 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 using one to three lags.[34] As is clear from the figure, differences between the expected and realized price growth are considerable. Such volatility limits the scope for endogenous tariff setting through specific tariffs, as unanticipated changes in price level lead directly to unanticipated changes in protection.

[33]Our rest of world CPI is constructed by re-indexing our CPI series for each of Australia, Canada, Denmark, France, Italy, Japan, the Netherlands, Norway, Spain, Sweden, Switzerland, and the United Kingdom. We then calculate average annual price growth and use it to construct a rest of world CPI.

[34]We could of course construct a more sophisticated model to forecast price growth, but conduct this exercise here as a means to underscore the deviation from simple forecasts, which likely represent the upper limit of politicians' abilities in 1900.

A separate but related point is that, to the extent that specific tariffs are employed endogenously as a policy lever, we would expect specific tariff shares to vary substantially over time as both prices and political economy concerns fluctuate. Furthermore, we would expect a negative correlation between specific tariff shares between periods of price increases and periods of price declines. This is empirically not the case. In Table 5 we present pairwise correlations between industry-level STS across all trade policy regimes in our sample. Specific tariff shares are highly and positively correlated across all policy regimes.

Table 5: Cross Policy Correlation in Industry Specific Tariff Shares

	Dingley	Payne-Aldrich	Underwood	Fordney-McCumber	Smoot-Hawley	Morrill
Dingley	1					
Payne-Aldrich	0.968	1				
Underwood	0.589	0.680	1			
Fordney-McCumber	0.808	0.857	0.730	1		
Smoot-Hawley	0.783	0.827	0.713	0.956	1	
Morrill	0.591	0.649	0.563	0.676	0.650	1

Notes: Specific tariff shares calculated as the share of duties among products with a specific tariff relative to total industry duties within an industry. Data are digitized from the Statistical Abstract of the United States for 1900-1930 quinquennially. Data are taken from the first sample within that policy regime. Correlation matrix is weighted by the average annual industry import share.

Indeed, persistence in specific tariff shares extends back to the Morrill Tariff. The correlation between the industry level specific tariff shares at the onset of the Morrill Tariff have a correlation exceeding 56% for all of our contemporary policy regimes.[35] Motivated by this finding, in Table 6 we re-estimate our baseline industry-level specifications from Table 2, instrumenting for changes in realized protection with an analogous measure using Morrill Tariff specific tariff shares.[36] We are thus exploiting changes in tariff levels driven by price growth interacted with industry specific tariff shares set, at a minimum, 40 years prior. Results can be found in table 6.

As before, changes in realized protection are strongly related to changes in import growth. The point estimates are similar in magnitude and exhibit the same pattern as those using contemporaneous specific tariff shares. 10-year effects are larger than 5-year, and aggregate price variation elicits larger responses than industry level price variation. With the exception of the five-year specifications using the aggregate UK CPI, these results are significant at conventional levels despite

[35] In appendix **??** we show that although the Morrill specific tariff share is predictive of subsequent industry specific tariff shares, it is not predictive of subsequent *levels* of AVE protection.

[36] Note that the number of observations differ slightly from those in Table 2 due to the smaller number of industries found in the 1861 import data.

Table 6: US Import Growth and Instrumented Changes in Realized Protection.

	Panel B: 10-Year $\Delta Ln\left(Imports_{it}^{US}\right)$					
ΔRP_{it}^{M}	-1.232*	-1.233*	-1.307*	-0.799***	-0.797**	-0.821**
	(0.614)	(0.622)	(0.649)	(0.287)	(0.290)	(0.320)
$Ln(1+AVE_{it_0})$		-0.010	-0.001		-0.023	-0.029
		(0.036)	(0.033)		(0.033)	(0.030)
STS_{it_0}			-0.023			0.013
			(0.034)			(0.028)
$\Delta Ln(P_{it})$				-0.102	-0.091	-0.094
				(0.202)	(0.207)	(0.203)
Obs.	115	115	115	115	115	115
R^2	0.316	0.310	0.317	0.416	0.413	0.411
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Price Growth	UK_t	UK_t	UK_t	UK_{it}	UK_{it}	UK_{it}
SITC-2 Industries	29	29	29	29	29	29
	Panel B: 5-Year $\Delta Ln\left(Imports_{it}^{US}\right)$					
ΔRP_{it}^{M}	-0.984	-0.987	-0.997	-0.564**	-0.570**	-0.614**
	(0.612)	(0.602)	(0.613)	(0.271)	(0.273)	(0.299)
$Ln(1+AVE_{it_0})$		0.063*	0.072*		0.047	0.037
		(0.032)	(0.037)		(0.041)	(0.033)
STS_{it_0}			-0.018			0.021
			(0.032)			(0.026)
$\Delta Ln(P_{it})$				0.259	0.249	0.243
				(0.162)	(0.163)	(0.159)
Obs.	201	201	201	201	201	201
R^2	0.200	0.202	0.202	0.321	0.321	0.323
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Price Growth	UK_t	UK_t	UK_t	UK_{it}	UK_{it}	UK_{it}
SITC-2 Industries	29	29	29	29	29	29

Notes: Dependent variable is annualized log change in US industry imports constructed from 10-year changes in panel A and 5 year changes in Panel B. ΔRP_{it} is change in realized protection which is the US industry specific tariff share times the negative price growth. Here we have instrumented ΔRP_{it} with that implied by the industry specific tariffs shares under the Morrill Tariff of 1861. Annualized changes in price levels are based on the aggregate UK CPI in column 1-3 and UK industry import unit values in columns 4-6. All regressions are weighted by start of period import values. Standard errors clustered at 2-Digit SITC level and reported in parenthesis. *, **, *** indicate $p < .1$, $p < .05$, $p < .01$ respectively.

the smaller sample size.

As a whole, these results suggest that political economy concerns do not play a dominant role in determining specific tariff shares. Path dependence in policy setting means that tariffs in the early twentieth 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 come by.

5 Local Effects of Import Exposure

Having established the role specific tariffs play in determining import competition at the industry level, we now turn to quantifying the local labor market effects of import shocks from 1900 to 1940, using our measure of realized protection as an instrument. We aggregate industry-level exposure to the county level using data on local employment from the full count decennial Census (Ruggles et al., 2020). To facilitate a mapping between trade flows and employment levels, we first concord the SITC industry classifications described above to Census industries.[37]

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. Finally, we take the decadal difference of log imports per worker within each county. Our county level measure of import exposure is thus:

$$\Delta Ln(IPW_{ct}) = \Delta Ln \left(\sum_i \frac{L_{ict_0}}{L_{ct_0}} \frac{Imports_{it}}{L_{it_0}} \right) \tag{9}$$

Where $\frac{Imports_{it}}{L_{it_0}}$ 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.[38]

Similarly, we construct a county-level measure of changes in realized tariff protection by weighting industry realized protection by local start-of-decade industry labor shares. As a baseline we will employ our aggregate UK CPI based measure of changes in prices:

$$\Delta RP_{c,t} = -\Delta Ln(p_t) \sum_i \frac{L_{ict_0}}{L_{ct_0}} STS_{it}, \tag{10}$$

and we will control for the start of period AVE_{ct}, with a similarly constructed county-specific employment weighted average of industry-level AVE_{it_0}.

Figure 6 displays the geographic distribution of specific tariff shares in county-level in each

[37] Specifically, we map all counties to consistent geographic 1900 boundaries using the crosswalk created by Eckert et al. (2020). Then we construct population weights based on the IND1990 variable in the IPUMS data. Trade flows are mapped to these industries via a procedure detailed in Appendix D.

[38] 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).

decade. As is clear from the figure, the variation across industries described above begets variation across regions. The prevalence of specific tariffs in certain agriculture and food products as well as mining, for instance, led to reductions in protection for the Great Plains and Upper Midwest in he first half of our sample. Cotton, however, was duty free during this era, implying very little exposure to price changes for much of the Deep South. Sharp declines in prices between 1920 and 1930, then, implied increased protection in much of the West and Appalachia, but not in the Deep South. By 1930, reliance on specific tariffs had expanded more broadly throughout the South and Gulf Coast, and we thus see a more mixed geographical distribution.

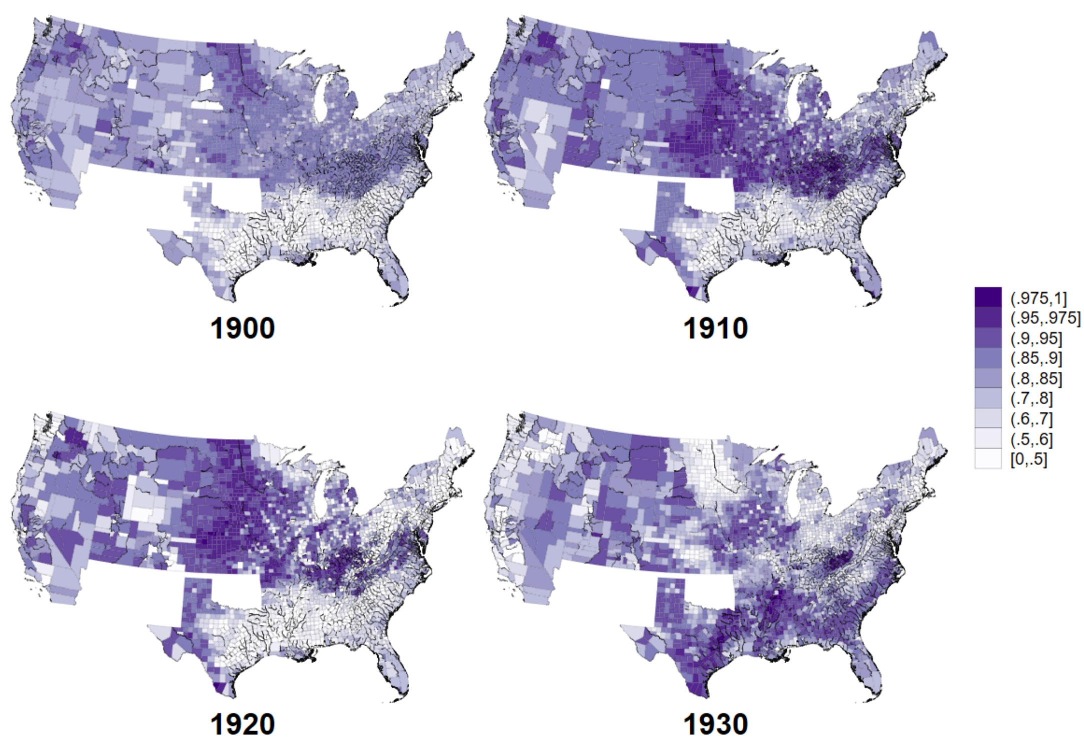


Figure 6: Start of Decade County STS_{ct}

In Table 7 we document relationship between changes in realized protection on log import growth at the county level. In column 1 we include only period fixed effects. As with the industry specifications, the relationship is negative and statistically significant: rising price levels lead to reduced specific-tariff-driven protection and an increase in imports at the county level. By way of interpretation, consider increasing the county's change in realized protection by one standard deviation (or 32%). This move corresponds to a 21.8% increase in import growth– roughly half of a standard deviation in the dependent variable.[39]

Table 7: Changes in Log Imports Per Worker versus ΔRP_{ct}

	1900-1940	1900-1940	1900-1940	Omitting 1900-1910	Omitting 1910-1920	Omitting 1920-1930	Omitting 1930-1940
ΔRP_{ct}	-0.671***	-0.678***	-0.714***	-0.708***	-0.486***	-0.735***	-0.716***
	(0.098)	(0.095)	(0.099)	(0.096)	(0.085)	(0.162)	(0.097)
AVE_{ct_0}		-0.188	-0.395***	-0.573***	-0.350**	-0.206**	-0.394**
		(0.115)	(0.082)	(0.105)	(0.151)	(0.102)	(0.152)
Obs.	11,059	11,059	11,059	8,313	8,288	8,288	8,288
R^2	0.789	0.790	0.797	0.802	0.810	0.690	0.806
Year FE	Y	Y	Y	Y	Y	Y	Y
Region FE	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 column 2 we control for the county AVE_{ct}. Inclusion of this control increases the coefficient of interest slightly and leaves it both statistically significant. We note that the start of period ad valorem equivalent tariff, AVE_{ct}, is negatively correlated with subsequent import growth, consistent with the notion that import tariff levels restricted import growth. In column 3, we introduce Census region fixed effects to control for persistent regional differences in import growth throughout the period that might correlate with tariff exposure at the local level. This increases the magnitude of the point estimate of interest somewhat. Given the strong geographic clustering show above, it is not surprising that controlling for persistent differences across regions. Our results remain statistically significant and economically meaningful.

A primary issue for our analysis is the effect of large, idiosyncratic events such as World War I or the Great Depression. To ensure that the relationship documented in the table is not driven exclusively by outlier events, in Columns 4 through 7 we repeat the specification from Column 3, sequentially omitting one decade in each column. As is clear from the columns, the relationship remains strong across all columns – the relationship between realized protection and imports at the county level is not driven by solely by any specific decade. The most substantial difference is caused by omitting the period of 1910-1920; this doubles the point estimate of interest. This is due to the enormous price growth during the period, such that omitting it reduces the range of

[39] Summary statistics for these variables may be found in Appendix Table D7.

variation in realized protections falls considerably when it is omitted.

5.1 Import Growth and Labor Market Outcomes

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

$$\Delta Outcome_{ct} = \beta_0 + \beta_1 \Delta Ln(\widehat{IPW}_{ct}) + \beta_2 X_{ct_9} + \gamma_t + \epsilon_{ct} \tag{11}$$

Here, X_{ct_0} represents a set of start of period controls for county characteristics that may otherwise contaminate our estimates. All specifications are weighted by 1900 county population, with standard errors clustered at the state level.

In Table 8 we regress decadal changes in labor force to population ratios for men ages 16-65 against $\Delta Ln(\widehat{IPW}_{ct})$.[40] Column 1 includes only our measure of interest and decade fixed effects. The results in the column show that increased import competition reduces county labor market attachment. Increasing a county's exposure to log import growth by one standard deviation amounts to a 4.3 log point reduction in the labor force participation growth rate. This is nearly one standard deviation in the dependent variable. While the estimated effect is large, it is worth noting that unconditionally the labor force participation rate is roughly 92% at the start of our sample. In column 2 we control for AVE_{ct}. This leaves the point estimate of interest unchanged.

As discussed above, a primary concern with this approach is that specific tariff shares are chosen non-randomly, such that they predict the trade response to price shocks for reasons other than changes in AVE tariffs. While we find no evidence of this at the industry level, we explore the possibility further at the county level here.

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. As can be seen in Figure 7, this regional variation corresponds closely to the variation in agricultural and manufacturing employment, with the Southern and Plains regions focused primarily on

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

Table 8: Changes in Labor Force Participation

	(1)	(2)	(3)	(4)
$\Delta Ln(\widehat{IPW_{ct}})$	-0.092***	-0.091***	-0.097***	-0.099***
	(0.014)	(0.014)	(0.015)	(0.014)
AVE_{ct_0}		-0.001	0.011	0.023
		(0.018)	(0.017)	(0.018)
% Manufacturing$_{ct_0}$			0.018	0.025*
			(0.012)	(0.013)
% Farm$_{ct_0}$			0.006	0.002
			(0.005)	(0.004)
% Literate$_{ct_0}$			-0.011	-0.039
			(0.031)	(0.036)
% Foreign Born$_{ct_0}$			-0.022***	-0.020***
			(0.007)	(0.008)
% Non-White$_{ct_0}$			-0.014	-0.017*
			(0.010)	(0.010)
% Under 35$_{ct_0}$			-0.030	-0.046**
			(0.019)	(0.023)
Obs.	11,056	11,056	11,056	11,056
R^2	0.242	0.242	0.230	0.230
1^{st} Stage F-stat	47.159	50.916	52.998	52.385
Year FE	Y	Y	Y	Y
Region FE	N	N	N	Y

Notes: Dependent variable is change in log labor force to population ratios among men ages 16-65 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 10. Regressions weighted by start of period population. Standard errors are clustered at the state level. *, **, *** indicate $p < .1$, $p < .05$, $p < .01$ respectively.

agriculture, while manufacturing clusters in the North. 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 3 we control for the county share of labor in agricultural production in the 1900 Census and the share of the county labor force employed in manufacturing. Since we are running a first difference specification, this amounts to accounting for agricultural and manufacturing trends throughout our sample.[41] 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

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

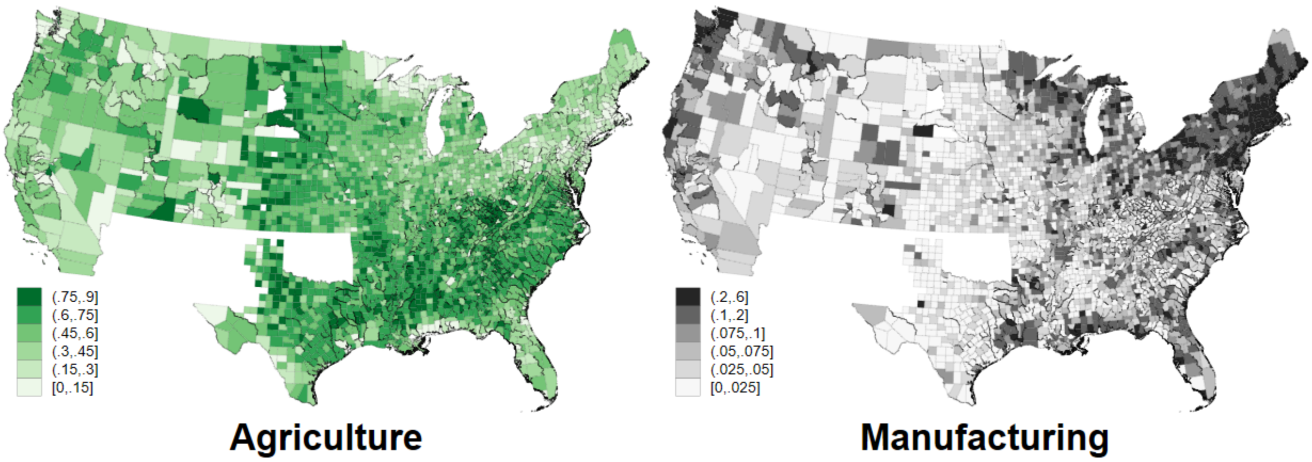


Figure 7: Employment Shares in Agriculture and Manufacturing, 1900
Notes: Agricultural production corresponds to 1990 IPUMS Census industries 010 and 011, while manufacturing corresponds to industries 100-392.

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 by approximately one-third, but leaves our primary finding qualitatively similar. Finally, 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 3, this addresses the concern that our results might be driven by variation in broader, regionally clustered sectoral trends to economic shocks. Our results are largely unaffected by this addition.

These results suggest that import competition reduced labor force attachment substantially during this period. In Table 9, we consider a number of robustness tests of this baseline result. Specifically, we replicate column 4 of Table 8 with a single modification in each column. Column 1 represents our baseline result without weighting by 1900 population. This reduces the point estimate by approximately 8% but leaves it large and statistically significant. In column 2 we exploit industry variation in price growth using UK import unit values as in Section 4 above. Specifically,

Table 9: Changes in Labor Force Participation Robustness

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\Delta Ln(\widehat{IPW_{ct}})$	-0.086***				-0.099***	-0.183***	-0.069***	-0.100***
	(0.022)				(0.014)	(0.048)	(0.012)	(0.015)
$\Delta Ln(\widehat{IPW_{ct}^{UK_{it}}})$		-0.102***						
		(0.016)						
$\Delta Ln(\widehat{IPW_{ct}})$ $\times North$			-0.097***					
			(0.016)					
$\Delta Ln(\widehat{IPW_{ct}})$ $\times South$			-0.106***					
			(0.015)					
$\Delta Ln(\widehat{IPW_{ct}})$ $\times Plains$				-0.093***				
				(0.014)				
$\Delta Ln(\widehat{IPW_{ct}})$ $\times Non-Plains$				-0.121***				
				(0.023)				
Obs.	11,056	11,056	11,056	11,056	8,312	8,286	8,285	8,285
R^2	0.16	0.22	0.23	0.16	0.28	-0.01	0.40	0.02
1^{st} Stage F-stat	3.586	42.997	27.503	18.583	54.504	32.786	20.664	53.964
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Region FE	Y	Y	Y	Y	Y	Y	Y	Y
Weights	1900	t_0	t_0	t_0	t_0	t_0	t_0	t_0
Omit	-	-	-	-	1900	1910	1920	1930

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 10. 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.

we reconstruct equation 10 by using changes in UK industry unit values. The point estimate of interest is largely unchanged from the baseline specification, though the standard deviation is slightly larger. This implies a 4.7 log point change in labor force participation.

As discussed above at length, 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 there were the primary driver of our results, we would significantly different point estimates for ΔRP_{ct} 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.[42] While

[42] "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.

point estimates are slightly larger for the South and non-Plains regions, estimates are statistically significant 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 WWI nor the Great Depression drive our results. Our key finding obtains across all columns: increased import competition, driven by inflation combined with specific tariffs, leads to relative reductions in local labor force participation.

5.2 Other Economic Outcomes

Leaving the labor force entirely is only one potential response to import competition. And, given the lack of a broad social safety net until the onset of the Great Depression, this may not be the primary margin of adjustment during our sample. In this section we consider other mechanisms of adjustment, including changes in occupation, industry, and location.

We begin by exploring whether import growth also affects income in our data. At the start of our sample, the federal income tax did not exist. Consequently, we have no direct measures of income. However, IPUMS does report occupational income scores, which measure the median income within an occupation. We are thus able to examine whether individuals in counties more exposed to imports shift to lower-paying occupations on average.[43] In Table 10, we repeat the specifications from Table 8 with log changes in average county occupational income – among individuals reporting a non-zero income – as the outcome. The estimates in columns 1 and 2 imply that a 1 standard deviation increase in log import growth leads to a 2.2 log point reduction in occupational income growth, or about a half of a standard deviation of that variable. This suggests that workers exposed to import competition in these areas experience relatively lower growth in high paying occupations. because we do not observe income, but a measure of the income for a given occupation, this coefficients indicates that increased import exposure leads to reduced we find results that are statistically insignificant. The estimated effect increases by half when accounting for differential labor market composition in column 3 and region fixed effects in column 4 – a one standard deviation

[43] Note that the occupational income score is defined based on the 1950 Census, and income scores vary across occupations, but not locations or demographic groups.

Table 10: Changes in Log Occupational Income

	(1)	(2)	(3)	(4)
$\Delta Ln(\widehat{IPW_{ct}})$	-0.049***	-0.049***	-0.072***	-0.072***
	(0.014)	(0.014)	(0.016)	(0.016)
AVE_{ct_0}		-0.006	0.085***	0.092***
		(0.042)	(0.023)	(0.026)
% Manufacturing$_{ct_0}$			0.065***	0.063***
			(0.015)	(0.017)
% Farm$_{ct_0}$			0.062***	0.066***
			(0.007)	(0.007)
% Literate$_{ct_0}$			0.027	0.032
			(0.029)	(0.027)
% Foreign Born$_{ct_0}$			-0.050***	-0.049***
			(0.012)	(0.012)
% Non-White$_{ct_0}$			-0.009	-0.012
			(0.011)	(0.011)
% Under 35$_{ct_0}$			0.020	0.035
			(0.042)	(0.045)
Obs.	11,053	11,053	11,053	11,053
R^2	0.22	0.22	0.26	0.26
1^{st} Stage F-stat	47.174	50.930	53.000	52.391
Year FE	Y	Y	Y	Y
Region FE	N	N	N	Y

Notes: Dependent variable is log change in occupational income score 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 10. Regressions weighted by start of period population. Standard errors are clustered at the state level. *, **, *** indicate $p < .1$, $p < .05$, $p < .01$ respectively.

increase in log import growth per worker 3.9% decrease in log occupational income growth.

This result suggests labor market adjustment across jobs among those remaining in the labor force. We explore this more directly in Table 11, in which we decompose labor force participation into shifts across mutually exclusive sectors. Here, we divide by the number of individuals in the labor force, such that the columns sum to 0.[44] The set of covariates is identical to that of column 4 from Table 10, though for brevity we include here only the coefficients from import growth and AVE.[45]

Our results are broadly consistent with a shift away from tradable and trade supporting sectors toward non-tradables. Our coefficient of interests reveals that import exposure led to a shift

[44] We exclude individuals in the labor force but not reporting an industry for these results.
[45] Full coefficients are available upon request.

Table 11: Changes in Sectoral Employment

	Tradables				Non-Tradables		
	Ag.	Manuf.	Mining	Transport	Construction	Wholesale Retail	Finance Service
$\Delta Ln(\widehat{IPW_{ct}})$	0.059***	-0.166***	-0.016*	-0.038***	0.073***	0.038***	0.051***
	(0.015)	(0.020)	(0.009)	(0.011)	(0.015)	(0.005)	(0.008)
AVE_{ct_0}	-0.162***	-0.056	0.113***	0.007	0.029	-0.014	0.082***
	(0.033)	(0.037)	(0.038)	(0.012)	(0.034)	(0.009)	(0.017)
Obs.	11,053	11,053	11,053	11,053	11,053	11,053	11,053
R^2	0.45	-0.07	0.07	0.27	0.29	0.52	0.34
1^{st} Stage F-stat	52.39	52.39	52.39	52.39	52.39	52.39	52.39
Year FE	Y	Y	Y	Y	Y	Y	Y
Region FE	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 10. 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.

away from manufacturing and towards agriculture, with secondary roles for transportation, which declined in importance, and construction and retail, which both expanded. It bears repeating that this specification exploits cross county differences in realized protection *within* regions and decades. Thus, these results cannot be explained by aggregate shocks that might differentially affect manufacturing- or agriculture-intensive regions at any moment in time. These results are consistent with the notion that import competition inhibited the shift towards manufacturing, and suggests that service and farm work might have served as a kind of outside option in this era.

Beyond endogenous occupation and industry switching, migration offers a potential margin of adjustment to import competition shocks. However, even in response to large shocks, migration effects may be muted (Hakobyan and McLaren, 2016; Dix-Carneiro and Kovak, 2019) or masked by secular migratory trends or lagged responses (Greenland, Lopresti, and McHenry, 2019). We explore the extent to which migration played an important role in the response to import competition during this period by regressing the change in log county population on import growth, again instrumented with changes in realized protection. As before, we introduce controls sequentially. Results are reported in Table 12.

We do find some evidence of shifts in relative population growth in response to import competition, with a potential role for regional differences over time. Unconditionally, we observe that

Table 12: Changes in Log Population

	(1)	(2)	(3)	(4)	(5)
$\Delta Ln(\widehat{IPW_{ct}})$	-0.115*	-0.136*	-0.033	-0.055	-0.084
	(0.066)	(0.072)	(0.072)	(0.067)	(0.074)
AVE_{ct_0}		0.349***	0.037	0.224	0.241*
		(0.114)	(0.149)	(0.152)	(0.137)
% Manufacturing$_{ct_0}$			-0.011	0.187***	0.147***
			(0.124)	(0.064)	(0.055)
% Farm$_{ct_0}$			-0.200***	-0.172***	-0.092***
			(0.046)	(0.038)	(0.032)
% Literate$_{ct_0}$			-0.028	-0.088	-0.215**
			(0.102)	(0.103)	(0.107)
% Foreign Born$_{ct_0}$			0.094	0.147***	0.061
			(0.065)	(0.053)	(0.054)
% Non-White$_{ct_0}$			0.065	-0.056	-0.084**
			(0.060)	(0.044)	(0.042)
% Under 35$_{ct_0}$			0.267	0.121	-0.353
			(0.326)	(0.199)	(0.234)
$\Delta Ln(Population_{ct_{-1}})$					0.207***
					(0.043)
Obs.	11,056	11,056	11,056	11,056	8,286
R^2	0.35	0.36	0.42	0.47	0.47
1^{st} Stage F-stat	47.16	50.92	53.00	52.39	54.42
Year FE	Y	Y	Y	Y	Y
Region FE	N	N	N	Y	Y

Notes: Dependent variable is change in log population at county level from 1900-1910, 1910-1920, 1920-1930, 1930-1940. Regressions weighted by start of period population. Standard errors clustered at the state level.

increased import growth leads to substantially lower population growth. This effect is increased slightly when accounting for the AVE_{ct} in column 2. Beginning with column 3, we include the full set of county-level controls described above. With these controls included the point estimate remains negative, but is dramatically reduced in size and no longer significant. This seems to have been primarily driven by the inclusion of a control for the initial share of the population engaged in agriculture. This remains true in columns 4, when we introduce region fixed effects. In column 5, we introduce controls for lagged county population growth and find that it increases the magnitude of the point estimate but it is still statistically insignificant at conventional levels. Thus, while it seems likely that differential population trends in agricultural regions relative to manufacturing-intensive play a substantial role in shaping migration during our sample, we find no strong evidence that import growth had a significant impact on population growth during our sample.

Finally, we consider which groups are most affected by import competition during this period, replicating both our labor force participation and occupational income results across various subgroups in Panel A and Panel B of Table participation in Table 13 respectively. All specifications replicate column 4 in Table 8. The results in Panel A indicate that it is both the youngest and

Table 13: County Import Penetration and Labor Force Participation by Subgroups

	(1) 15-34	(2) 35-54	(3) 55-64	(4) White	(5) Black	(6) Foreign Born	(7) Urban	(8) Rural
	Panel A: Δ Labor Force Participation							
$\Delta Ln(\widehat{IPW_{ct}})$	-0.151***	-0.027**	-0.122***	-0.097***	0.235	-0.066***	-0.062***	-0.084***
	(0.021)	(0.011)	(0.021)	(0.013)	(1.362)	(0.019)	(0.024)	(0.018)
Obs.	11,056	11,056	11,021	11,056	9,000	9,998	5,548	10,943
	Panel B: Δ Ln(Occupational Income)							
$\Delta Ln(\widehat{IPW_{ct}})$	-0.074***	-0.071***	-0.034***	-0.060***	3.305	-0.071***	-0.066***	-0.148*
	(0.020)	(0.014)	(0.013)	(0.013)	(16.045)	(0.021)	(0.014)	(0.076)
Obs.	11,053	11,053	11,017	11,053	8,868	9,922	5,544	10,940
Year FE	Y	Y	Y	Y	Y	Y	Y	Y
Region FE	Y	Y	Y	Y	Y	Y	Y	Y

Notes: Dependent variable change in labor force participation among men ages 16-64 by demographic group 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 10. Controls from column 4 in Table 8 are included but suppressed. Regressions weighted by start of period population. Standard errors clustered at the state level. *, **, *** indicate $p < .1$, $p < .05$, $p < .01$ respectively.

the oldest workers who bear the costs of rising import competition. The effect among the individuals age 15-34 is 50% larger than our baseline result and the effect among those 55 and older approximately 30% larger than the baseline finding. By contrast, those in their peak-earnings years (35-54), have an estimated impact of import competition of one-fifth the size of the youngest working group. The effects are most strongly effect among white workers. This effect is consistent with the large effects we report in manufacturing – white workers groups are disproportionately likely to be employed in manufacturing, particularly in the early years of our sample. Perhaps surprisingly, the effect on rural workers is slightly larger than the effect on their urban counterparts. This is may be due to thicker labor markets in urban counties – individuals who are displaced by import competition face fewer opportunities in rural counties, and as a result are more likely to leave the labor force entirely.

In Panel B we repeat this analysis for occupational income scores. As before, we condition on a positive income, so that those who leave the labor force are not included. The effects we observe here are broadly similar to those for employment. We observe the largest effects among the youngest group of individuals and 35-54 year olds, with a smaller effect among the oldest age group. Again, we find a negative effect concentrated among the white population and those in rural locations. Taken together, this suggests that groups with fewer outside options – the very young, the older, and those in less vibrant economic locales – reduce attachment to the labor force entirely. Middle aged workers are more likely to remain in the labor force, but potentially see their occupational standing reduced.

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 local level, and predicts subsequent county-level labor market outcomes. Labor force participation and occupational income declines in response to import competition, particularly in the manufacturing sector and among the young.

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 throughout the twentieth 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 countries, not just the early 20^{th} century US, employ specific tariffs. And 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.[46] Finally, this period is a particularly rich policy environment in which to explore the relationship of trade to a variety of government activities. The ability of governments to alleviate the negative consequences of trade is of first order importance for trade economists. Policy movements during 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 additional effects of a a rich set of coincident policy interventions.

[46] Of course, various GATT/WTO rounds and regional trade agreements provide for an additional source of variation.

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A 1900-1940 US Imports and Tariff Data & Industry Classification

Every 5 years from 1900-1930 we digitize the Foreign Commerce and Navigation of the United States and obtain imports and tariff line data. For each year we manually categorized the products into their native SITC (Revision 2) 2-digit sector. This process yields a highly detailed set of products and commensurate duties across each trade policy regime in our sample. Table A1 provides an overview of the number of products (dutiable and duty free) imported into the US during these years as well as the percent of imported value we are able to concord to the 2-digit SITC revision 2 classification as detailed in this section.

Table A1: Tariff Data Coverage by Year

Year	Import Data Source	Tariff-Import Coverage	Tariff Lines
1900	Statistical Abstract of the United States	95.4%	2269
1905	Statistical Abstract of the United States	98.9%	2562
1910	Statistical Abstract of the United States	95.5%	4173
1915	Statistical Abstract of the United States	96.0%	2725
1920	Statistical Abstract of the United States	95.2%	2839
1925	Statistical Abstract of the United States	95.0%	5490
1930	Statistical Abstract of the United States	95.4%	4984

Notes: Table presents information about the raw tariff line data which form the basis of our analysis. Tariff-Import coverage indicates the percent of import value which we were able to categorize to an SITC-2. Tariff lines indicates the number of unique tariff line items in each year's data.

The disaggretate nature of these tariff lines allows us to separately map individual import competing products to various stages of the production processes that may take place in disparate areas of the country. At one extreme, we can differentiate, for example, between whole milk, skimmed milk, buttermilk, whole milk powder, skimmed milk powder, sweetened condensed milk, and unsweetened condensed milk – all of which would map to SITC-02 (Dairy Products and Birds' Eggs). At another, we consider the production of fox fur coats. Our tariff line items include, for example,

- Live silver fox: SITC-94 (Live animals not for consumption)
- Undressed fox furs and fur skins: SITC-21 (Hides, skins, and furskins -raw)
- Dressed (not dyed) fox furs (other than silver fox): SITC-61 (Leather, manufactures, and

dressed furskins)

- Fur wearing apparel except fur hats from silver or black fox: SITC-84 (Articles of apparel and clothing)

and allow us to differentiate changes in competition along this supply chain.

A.1 Category Aggregation

In some cases it became clear that products were not listed with sufficient detail to select a category with certainty. In these cases we would combine two categories yielding a combined category. We detail these situations here.

SITCs 24 & 63

This combines Cork and Wood (24) with their Manufactures (63) largely due to discrepancies in categorizing lumber at various states of processing/milling. Furniture is not combined with these products.

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 article of pulp, for example, make it infeasible to separate these categories fully.

SITCs 27, 56, & 66

We combine Crude fertilizer and crude minerals (27), Fertilizers, manufactured (56), and Non-metalic mineral manufactures (66). These categories embed crude minerals and fertilizers. There is substantial overlap between unprocessed and manufactured fertilizers. Additionally there is overlap between non-metallic mineral manufactures including stone, and clay that may be used in those manufactures.

SITCs 41, 42, 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 sometimes cause elements of 41 and 42 to be categorized in 43. Unable to distinguish exactly when this might occur, we maintain a common level of aggregation.

SITCs 51-54 & 59

We aggregate Organic chemicals (51), Inorganic chemicals (52), Dyeing, tanning and coloring materials (53) , Medicinal and pharmaceutical products (54) and Chemical materials and products, nes (59). 51 and 52 have substantial overlap with 52 and 54 especially as product use over time changes. Some chemicals may be used both as a dying agent as well as for medicinal or cosmetic purposes making these indistinguishable in a consistent manner across all 6 cross sections of tariff data.

SITCs 67, 68, & 69

We combine iron and steel (67), Non-ferrous metals (68), and Manufactures of metals, nes (69). Metal alloys, manufactures of alloys, and difficulty distinguishing iron and steel manufactures used as inputs (67) from finished manufactures of metals (69) requires that we aggregate these categories

SITCs 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 disaggregation may not always be clear in tariff lines, particularly early in the sample.

SITCs 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.

SITCs 86 & 85

Because these categories are very infrequently populated in all of our samples over time, we map each product to the product which comprises the majority of its inputs. This is almost exclusively recategorizing rubber footwear to rubber, or leather footwear to leather.

SITC 94

The UK samples separate edible animals from animals for other than human consumption inconsistently and abruptly within decades. For consistency, map all of these animals to 00.

A.2 Residual Industry Ambiguity

When combined there are a small number of industries that enter or exit the sample which we believe are attributable to a change in product classification across years leading to an inability to distinguish between constituent products.

- SITC 09 is comprised solely of "vinegar" and "lard" which shows up intermittently throughout the sample. We remap the lard to animal fats and oils and drop the remaining vinegar observations.
- SITC 11 is almost wholly comprised of alcohol in some periods of our data. In 1919 prohibition of alcohol in the united states made imports illegal until its repeal in 1934. This would result in spurious changes in import growth during our sample that are unrelated to realized protection. We drop SITC 11 from our import data for these years.
- SITC "" Any uncategorizable goods are dropped from the sample. This typically occurs due to ambiguity about what the product is e.g. "Items specifically imported for the use of the United States."
- SITC 83 is absent from 1900-1920 but is otherwise comprised of leather bags and baskets. We re-assign these products to SITC 61.

- SITC 85 Footwear shows up independently in a subset of years but not all years. As a result we assign leather footwear to 61 (leather products) when it appears and rubber footwear to rubber products when it appears.
- SITC 87 is comprised of professional scientific instruments, and does not appear before 1930. We drop these.
- SITC 89 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. We drop this industry in our baseline sample.
- SITC 96 - coin other than gold
- SITC 97 - gold non monetary

A.3 US Imports and Tariffs: 1900-1940

We also digitize and concord US import values from the Foreign Commerce and Navigation every 5 years from 1900-1940. These flows are far more condensed than the tariff line data and have between 200-400 line items annually. These are then deflated using the US CPI and are used as our measure of US industry import values.

Figure A1: Sample of Pre-Digitized 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.

Table A2: Annualized Industry Summary Statistics

	1900	1905	1910	1915	1920	1925	1930	**Full Sample**
	Panel A: 10-Year Changes Annualized							
$\Delta Ln(Imports_{it}^{US})$	0.027	-	0.015	-	-0.059	-	-0.008	-0.017
	(0.071)	-	(0.093)	-	(0.070)	-	(0.040)	(0.077)
$-\Delta Ln(p_t)STS_{it_0}$	-0.003	-	-0.056	-	0.017	-	-0.009	-0.009
	(0.001)	-	(0.037)	-	(0.017)	-	(0.006)	(0.035)
$-\Delta Ln(p_{it})STS_{it_0}$	-0.007	-	-0.064	-	0.053	-	0.013	0.008
	(0.015)	-	(0.046)	-	(0.072)	-	(0.019)	(0.067)
	Panel B: 5-Year Changes Annualized							
$\Delta Ln(Imports_{it}^{US})$	0.033	0.020	-0.012	0.048	-0.049	-0.071	-0.056	-0.023
	(0.036)	(0.134)	(0.070)	(0.156)	(0.124)	(0.071)	(0.070)	(0.111)
$-\Delta Ln(p_t)STS_{it_0}$	-0.002	-0.004	-0.016	-0.064	0.027	0.008	0.010	-0.002
	(0.001)	(0.002)	(0.011)	(0.073)	(0.028)	(0.006)	(0.006)	(0.041)
$-\Delta Ln(p_{it})STS_{it_0}$	0.004	-0.019	-0.018	-0.051	0.081	0.040	0.030	0.019
	(0.016)	(0.023)	(0.036)	(0.076)	(0.108)	(0.067)	(0.029)	(0.080)

Notes: Table presents summary statistics for 5- and 10-year industry import growth and changes in realized protection. For ease of comparison, all variables have been annualized. Summary statistics are weighted by start of period real import values. Variable means are reported above variable standard deviations (in parenthesis).

B UK Imports and Unit Values: 1900-1938

B.1 Imports

UK imports are taken from 4 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. As a consequence we digitize bookending years in duplicate – one from each edition. For example, we obtain 1900, 1905, and 1910 from the same edition. We then obtain 1910, 1915, and 1920 from the next edition, and so on. Sources can be found in table B3.

Table B3: Sources of UK Import Data

Year	Text	Table	Pages
1900-1910	Statistical Abstract for the United Kingdom: 1915	No. 39	126-160
1910-1920	Statistical Abstract for the United Kingdom: 1924	No. 34	88-120
1920-1930	Statistical Abstract for the United Kingdom: 1932	No. 240	350-360
1930-1938	Statistical Abstract for the United Kingdom: 1940	No. 285	392-402

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

This ensures that if reported product categories have changed across editions of the Statistical Abstract from the United Kingdom we do not construct a change in imports spanning two distinct categorizations. While this is less important for individual imports, it does become more salient when constructing changes in industry level import prices where it becomes imperative to have a common set of goods at the start and end of the change. Finally, data on trade flows are unavailable for 1940. Consequently, we digitize the 1938 file and scale up all changes as needed to construct decadal equivalent flows.

B.2 Industry Price Indices

We similarly digitized import quantities and units of quantity from the same sources and in the same fashion. When constructing our five- or ten-year changes in price, we restrict our attention to products for which we can identify an appropriate SITC code, for which construct a unit price during both periods, and for which the units in both periods enable a consistent unit value. For example, if unit conversions were feasible (e.g. UK CWT (hundredweight), or UK Tons to 112 lbs. and 2240 lbs. respectively) we would make the appropriate quantity conversion to calculate a unit value. If not, (e.g. wine counted in bottles in 1900 and kegs in 1905), then this product was not included in constructing a change in unit price across periods. Table B4 reports the percent of aggregate import value 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 B4: Value Share Coverage

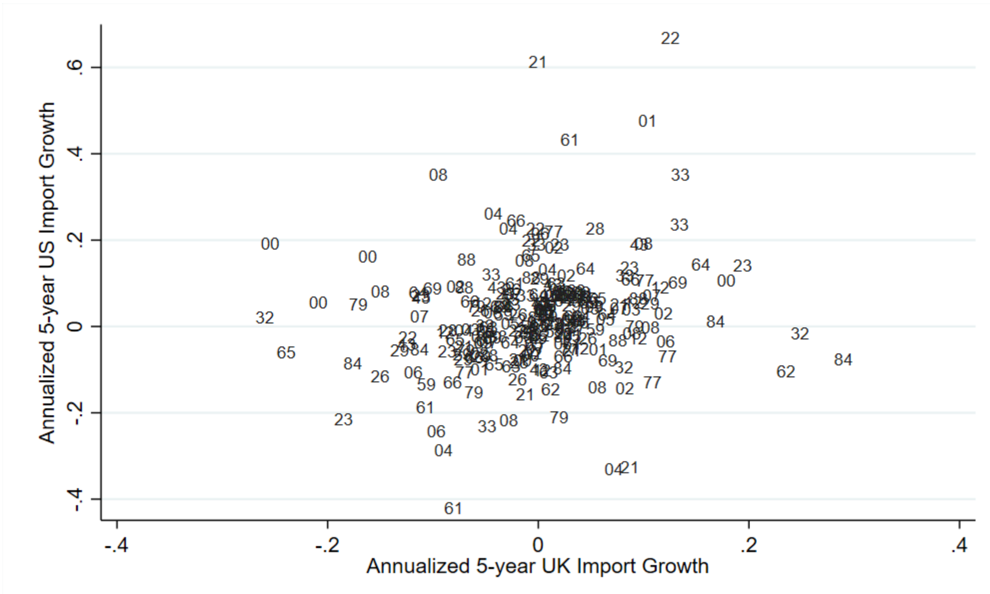
Year	SITC	5-year $\Delta Ln(P)$	5-year $\Delta Ln(P)$
1900	0.982	0.884	0.884
1905	0.980	0.910	-
1910	0.964	0.899	0.899
1915	0.974	0.933	-
1920	0.998	0.901	0.901
1925	0.997	0.882	-
1930	0.997	0.875	0.875
1935	0.998	0.880	-

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

We calculate a within product change in log prices which we weight to the SITC-2 based on start of period import values. For example, textile manufactures may contain information on silk and cotton products. For these we construct an average price of cotton textiles and silk textiles based on the constituent sub-products. The SITC-2 price index, is then based on the import shares of cotton and wool in the overall category, not just of the constituent products for which we have unit prices.

Finally, for some years we observe no trade flows within an SITC-2 category. In this situation we substitute the aggregate UK CPI as our measure of industry price growth.

Figure B2: Annualized 5-year Industry Log Import Growth: US vs UK Imports 1900-1940



C US Imports and Tariffs: 1848-1861

This section details the data used in construction of the Morrill Tariff era reliance on specific tariffs that immediately followed a 13 year period in which specific tariffs were wholly absent from US trade policy. This period was defined by two tariff regimes, the Walker Tariff of 1846 and the Tariff of 1857.

During this period imports were reported in the Foreign Commerce and Navigation of the United States. We digitize these data from digital downloads from the Babel Hathi Trust. These import series are published spanning the fiscal year. For example the first year of availability for this series is published in 1849 and provides coverage of imports from July 1, 1847 to June 30, 1848. With the exception fo the Morrill Tariff sample, all of our data from 1848-1860 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 C5

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 A. For the industry analysis the products are aggregated to these 2-digit industries.

Table C5: Sources of US Import Data

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

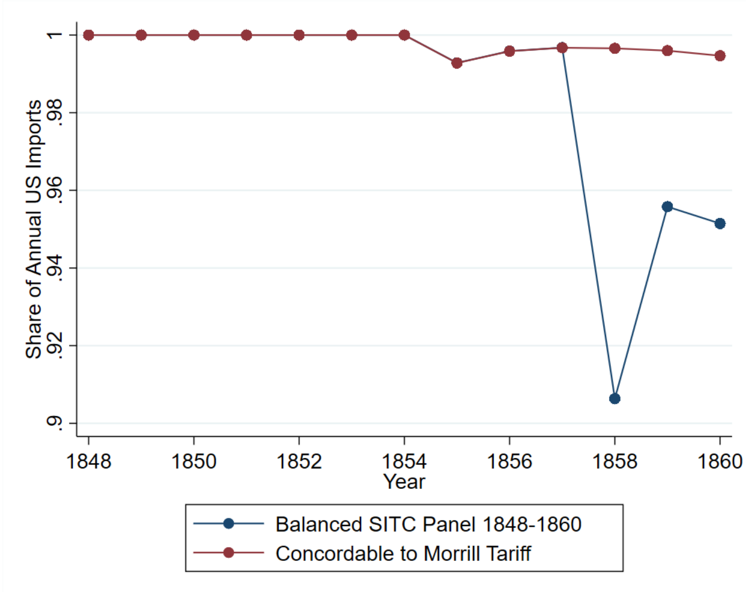
The 13 year sample contains 35 unique SITC 2-digit industries. The Morrill Tariff Data contain 34 unique SITC 2-digit industries. Their intersection comprise 32 such industries, 29 of which have non-missing observations for the full period. As before we remove SITC 89 from consideration and focus on a balanced panel resulting in a sample of 28 industries whose value covers nearly all imports across this period and are displayed in C3.

C.1 Concorded Product Level Sample

As a part of our analysis takes place at the product (rather than industry level) in what follows we detail the the procedure by which we link products across samples. This process is limited by the fact that product classifications underwent three changes from their initial classification in 1848. These changes occurred in 1855, 1857, and 1861. To address these issues we aggregate to common product groups that are clearly identifiable in each year. We use the following decision criteria for linking products:

1 Keep products disaggregated when possible

Figure C3: Aggregate Import Value Share at Industry Level



2 Aggregate consistently across years

- Year t: products "prunes," & "plums"

- Year t+1: product "prunes & plums"

- Action: Aggregate year t to "prunes and plums"

3 Aggregate in the presence of an inconsistently defined "aggregate" category

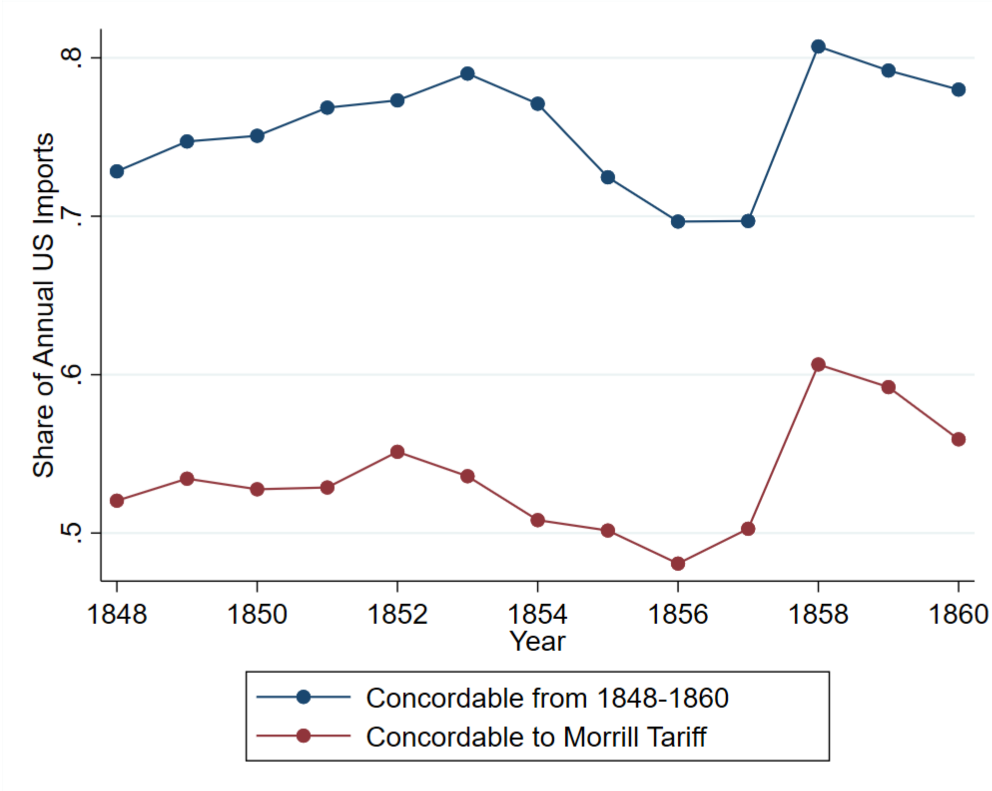
- Year t: products: wool carpet - Venetian, wool carpet - Turkish, wool carpet - other

- Year t+1: products: wool carpet - Venetian, wool carpet - Belgian, wool carpet - other

- Action: aggregate t and t+1 to "wool carpet - all origins"

The results of this procedure allow us to concord the vast majority of imports from 1848-1860. When linking these products to the Morrill Tariff data, we are able to construct a product level sample covering over half of imports during the same period. Our sample restrictions are displayed in Figure C4. The details of this mapping can be found below.

Figure C4: Aggregate Import Value Share at Product Level



C.1.1 Walker Tariff

The trade flows from 1848-1857 are all subject to the exclusively ad-valorem Walker Tariff. The set of products and level of aggregation change during this regime in 1855. We document 459 unique products across dutiable and duty free imports spanning 34 2-digit aggregated SITC industries defined by the procedure outlined in Appendix A. Three of these items are not concordable ("personal items and household effects of citizens dying abroad", "articles the produce of the US brought back," and "all other duty free articles"). The remaining 456 products account for 99.7% of import value through 1855, after which they account for between 93.1% and 96.6% of import value. From the 1848-1854 sample we are able to map 316 of these products to the 1855-1857 sample. 87 of the 456 products are found only in the 1848-1854 sample, while 53 are only found in the 1855-1857 sample. To obtain a consistent product group across both samples we form 274 unique product group links across both samples. These 274 product groups account for between 72% of the value of US imports in 1856 up to 82% of the value of imports in 1853.

C.1.2 Tariff of 1857

The trade data from 1858 undergo a new product classification with the implementation of the Tariff of 1857. Here we observe 456 unique products 438 have an identifiable SITC 2 digit code. From these products we are able to link to 250 of the 274 product groups constructed in linking the 1848-1854 samples to the 1855-1857 sample. This yields a product level import sample whose coverage of total imports can be see in figure C4

C.1.3 Morrill Tariff

Yet another product classification was implemented with the implementation of the Morrill Tariff. Here we observe 458 line items. Of these, 205 can items are concorded to 164 of the 250 product groups present in the linked 1848-1861 US imports. These 164 product groups account for 85.4% of the value of imports under the Morrill Tariff sample.

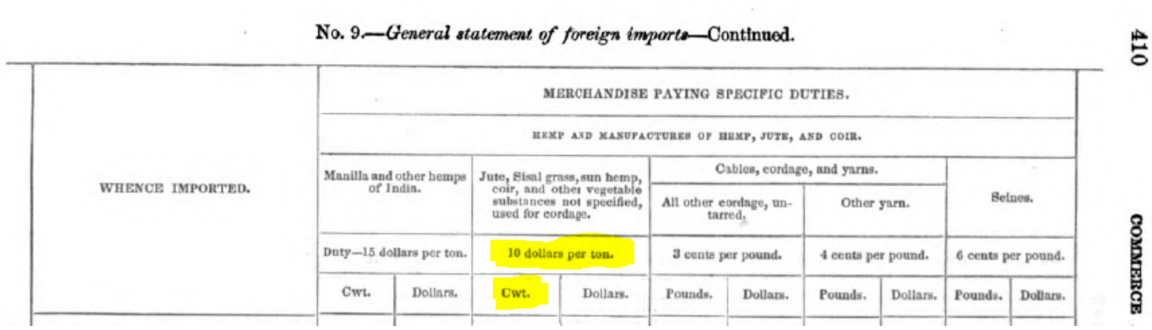
C.1.4 Morrill Tariff Duties and Specific Tariff Share

Normally, trade flows would be recorded from July 1 1860 to July 1 of 1861, however, the introduction of the new regime meant that the import values had to be recorded separately at the onset of the new tariff regime that began on March 1, 1861. Thus we construct our sample from the data reported from March 1, 1861 to July 1, 1861. While data are available for a full year from July 1, 1861 to July 1, 1862 the onset of the US Civil War resulted in a number of additional duties and trade restrictions for strategic and revenue generating purposes that modified the original Morrill Tariff. Because we are interested in the determinants of the reliance on specific duties and their relationship with imports prior to the Civil War's onset, we focus on the initial 4 month reporting period spanning March 1, 1861 - July 1, 1861.

For this sample we digitize product name, total value of imports, total units, rates of duty both ad-valorem and specific, units in which specific duties are specified which is not always the same as units imported. See for example the product listed:

"Jute sisal grass, sun hemp, coir, and other vegetable substances not specified used for cordage."

Figure C5: Morrill Tariff Digitization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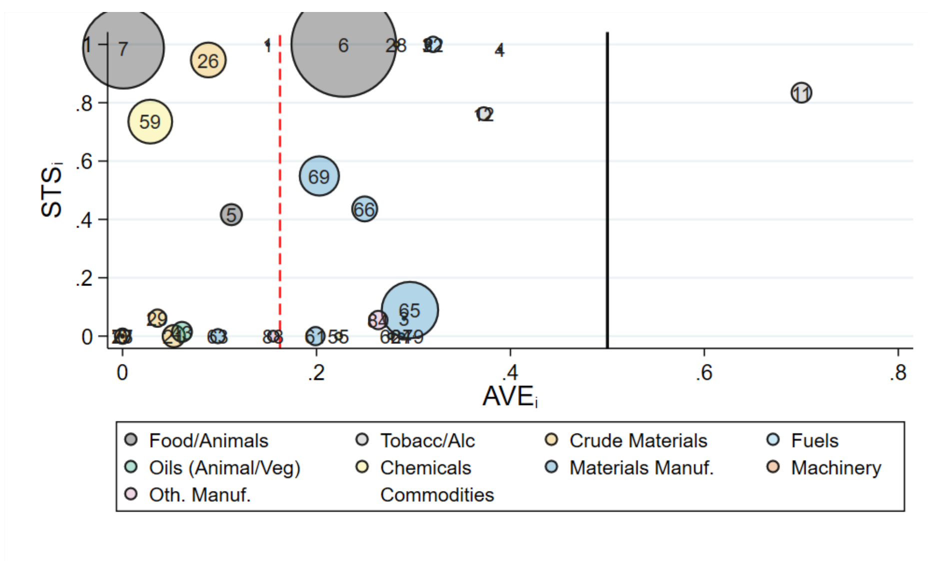
No. 9.—*General statement of foreign imports*—Continued.

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.				Seines.	
					All other cordage, untarred.		Other yarn.			
	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.

Value is recorded in current US dollars while the units are specified as Cwt. (United States hundredweight.) while the specific tariff is listed on a per ton basis. Total duties on this product are calculated by converting units to tons and then multiplying by $10.

Figure C6: Industry level $\mathbf{STS_i}$ versus $\mathbf{AVE_i}$ 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.

Here we show that industry reliance on specific tariffs is highly persistent across policy regimes, even as AVE tariff levels change dramatically. This pattern holds true for the Morrill Tariff as Well. More directly, we estimate the persistence of specific tariffs by regressing trade policy variables between 1900 and 1940 on their counterparts as specified by the Morrill Tariff of 1861:

$$STS_{it} = \beta_0 + \beta_1 STS_i^{Morrill} + \beta_2 AVE_i^{Morrill} + \beta_3 AVE_{it} + \epsilon_{it}$$
$$AVE_{it} = \beta_0 + \beta_1 STS_i^{Morrill} + \beta_2 AVE_i^{Morrill} + \beta_3 STS_{it} + \epsilon_{it}$$

We estimate these separately for each of the five trade regimes during our sample, as well as for all years jointly.[47] We report these results in Table C6.

[47] We restrict our attention to the 28 common SITC industries that appear in both the Morrill-era trade data and each of the five regimes in the 20th century data. These industries account for the vast majority of the value of imports in the 1900-1940 sample.

Table C6: Persistence in $AVE_i^{Morrill}$ and $STS_i^{Morrill}$

	(1) Dingley	(2) Payne Aldrich	(3) Underwood	(4) Fordney-McCumber	(5) Smoot-Hawley	(6) All
	Panel A: Dependent Variable is Policy STS_{it}					
$STS_i^{Morrill}$	0.666***	0.695***	0.441*	0.756***	0.646***	0.633***
	(0.121)	(0.115)	(0.232)	(0.110)	(0.128)	(0.097)
$AVE_i^{Morrill}$	0.605	-0.449	-1.581*	-0.063	-0.228	-0.214
	(0.468)	(0.633)	(0.784)	(0.561)	(0.462)	(0.432)
AVE_{it}	0.044	0.588*	1.496**	0.224	0.201	0.391**
	(0.261)	(0.301)	(0.591)	(0.244)	(0.128)	(0.180)
Constant	0.232*	0.207	0.222	0.196	0.317*	0.209*
	(0.126)	(0.124)	(0.158)	(0.126)	(0.154)	(0.114)
R^2	.616	.604	.314	.684	.613	.521
	Panel B: Dependent Variable is Policy AVE_{it}					
$STS_i^{Morrill}$	0.037	-0.111	-0.045	0.007	-0.006	-0.034
	(0.141)	(0.110)	(0.037)	(0.106)	(0.123)	(0.069)
$AVE_i^{Morrill}$	1.661***	1.248***	0.939***	0.894***	0.958**	0.958***
	(0.349)	(0.239)	(0.242)	(0.274)	(0.389)	(0.245)
STS_{it}	0.023	0.190*	0.140***	0.086	0.163*	0.112***
	(0.134)	(0.098)	(0.046)	(0.066)	(0.081)	(0.037)
Constant	-0.016	-0.038	-0.054	-0.045	-0.087	-0.037
	(0.044)	(0.048)	(0.049)	(0.045)	(0.088)	(0.040)
R^2	.548	.541	.489	.341	.187	.408
N	28	28	28	28	28	224
Time FE	N	N	N	N	N	Y
Weight	Value	Value	Value	Value	Value	Value

Notes: Dependent variable in Panel A is the industry specific tariff share at for each policy. Panel B's dependent variable is the industry ad-valorem equivalent for each policy. Robust standard errors in columns 1-5, and SITC-2 clustered standard errors (in column 6) are reported in parenthesis. *, **, *** indicate $p < .1$, $p < .05$, $p < .01$ respectively. Regressions are weighted by start of period real industry import values.

Panel A reports the correlation between STS_{it} under the Morrill Tariff and each of the five distinct trade policies in our sample. Panel B does the same for the AVE_{it}. In Panel A, we see that the relationship over time is strong: industry specific tariff shares between 1900 and 1930 are highly correlated with specific tariff shares under the Morrill Tariff. This is true across all policy regimes, up to 70 years after the Morrill Tariff became law. Cross-sectional differences in industry reliance on specific tariffs under the Morrill Tariff account for the majority of the variation in industry specific tariff shares in our main sample. This strong correlation suggests one of two possibilities. Either the political economy concerns dictating trade immediately preceding the US Civil War are the same as those during the five trade policies enacted from 1900-1930, or the industries that rely on specific tariffs during the 1900s do so for reasons that are unrelated related to time-varying political economy concerns.

Turning to Panel B, we find that the overall level of protection across industries is also highly persistent. However, the specific tariff share specified by the Morrill Tariff is unrelated to subsequent overall industry protection. Put differently, while $STS_i^{Morrill}$ is strongly correlated with STS_{it} during our primary sample, it is not related to the overall level of desired protection at the policy's onset.

D Concording to the Labor Market

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We begin with the SITC 2-digit revision 2 trade flows. From these we extract more disaggretate trade flows for 4 categories – cotton, oats, wheat, and maize. We do this in order to capture the spatially disparate production locations of these products in the US, thee importance of agriculture overall, and the importance of these crops in agriculture in particular. These form the baseline of our industry level trade flows which we concord to the labor market data.

We concord these to the Census Industry (IND1990) through three steps. First, using a conversion table provided by UN Trade Statistics (https://unstats.un.org/unsd/trade/classifications/correspondence-tables.asp) we map SITC codes to the 6-digit 1993 Harmonized System (HS) classification scheme. We rescale the apportioned weighs and map them to 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. This results in 39 unique SITC codes comprising 4614 6-digit Harmonized System codes.

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. This n:n mapping Finally, we concord SIC codes to Census industry codes in an n-to-one fashion 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. There are two exceptions to this mapping based on industries which, while present in our sample from 1900-1940, are obsolete by the 1950 sample.

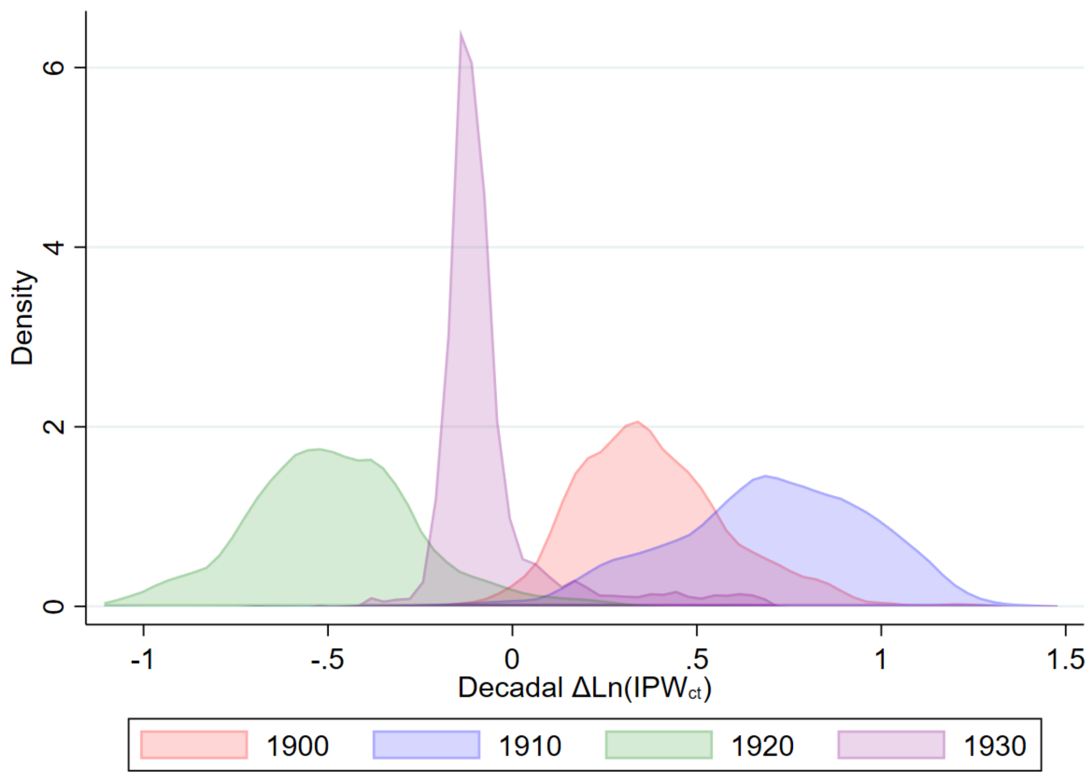
We present summary statistics for these variables here.

Table D7: Descriptive Statistics for Labor Market Analysis

	1900	1910	1920	1930	Total
$\Delta Ln(IPW_{ct})$	0.437	0.576	-0.417	-0.065	0.085
	(0.212)	(0.294)	(0.219)	(0.134)	(0.447)
ΔRP_{ct}	-0.029	-0.665	0.185	-0.094	-0.141
	(0.006)	(0.179)	(0.106)	(0.032)	(0.326)
$\Delta \frac{Labor_{ct}}{Population_{ct_0}}$	0.014	-0.023	-0.010	-0.039	-0.018
	(0.026)	(0.038)	(0.045)	(0.032)	(0.041)
$\Delta Ln(Income_{ct})$	-0.013	0.036	0.025	0.026	0.021
	(0.054)	(0.042)	(0.041)	(0.044)	(0.048)
ΔRP_{cit}	-0.087	-0.760	0.479	0.077	-0.042
	(0.037)	(0.204)	(0.271)	(0.076)	(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 D7: Kernel Density of Import Exposure by Decade



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