

What Lessons Does the Trade War of the 1930s Offer to Model-builders and Policy-makers in the 21st Century?

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Three “R”s of Trade Policy

Restriction

This is the most commonly argued rationale for tariffs – to restrict the entry of a product into the domestic market.

Target “import competing” products, firms or entire industries.

Instruments are typically tariffs which intend raise tariff-inclusive import prices on products or firms that would otherwise replace domestic products or firms.

Other restrictive policies include: 1) Quotas; 2) Domestic content requirements; 3) Regulations.

And other exotic variations.

Revenue

When ad-valorem tariffs are used, tariff revenue is the product of the tariff rate and the value imported.

Laffer Curve for imports captures the trade-offs between the motive of restriction and revenue.

As the tariff rises, tariff revenue increases less than one-to-one and eventually at a prohibitive tariff that restricts trade entirely no revenue is obtained.

We would not expect pure “revenue” tariffs beyond the revenue maximizing tariff rate, those would be considered excessively “restrictive.”

Reciprocity

The notion of “fairness” or “balanced concessions.”

Expect to see similar tariff levels on US goods by a partner to what the partner impose on the US in their domestic market.

This is often more easily assessed when comparing similar products or sectors than in a general sense.

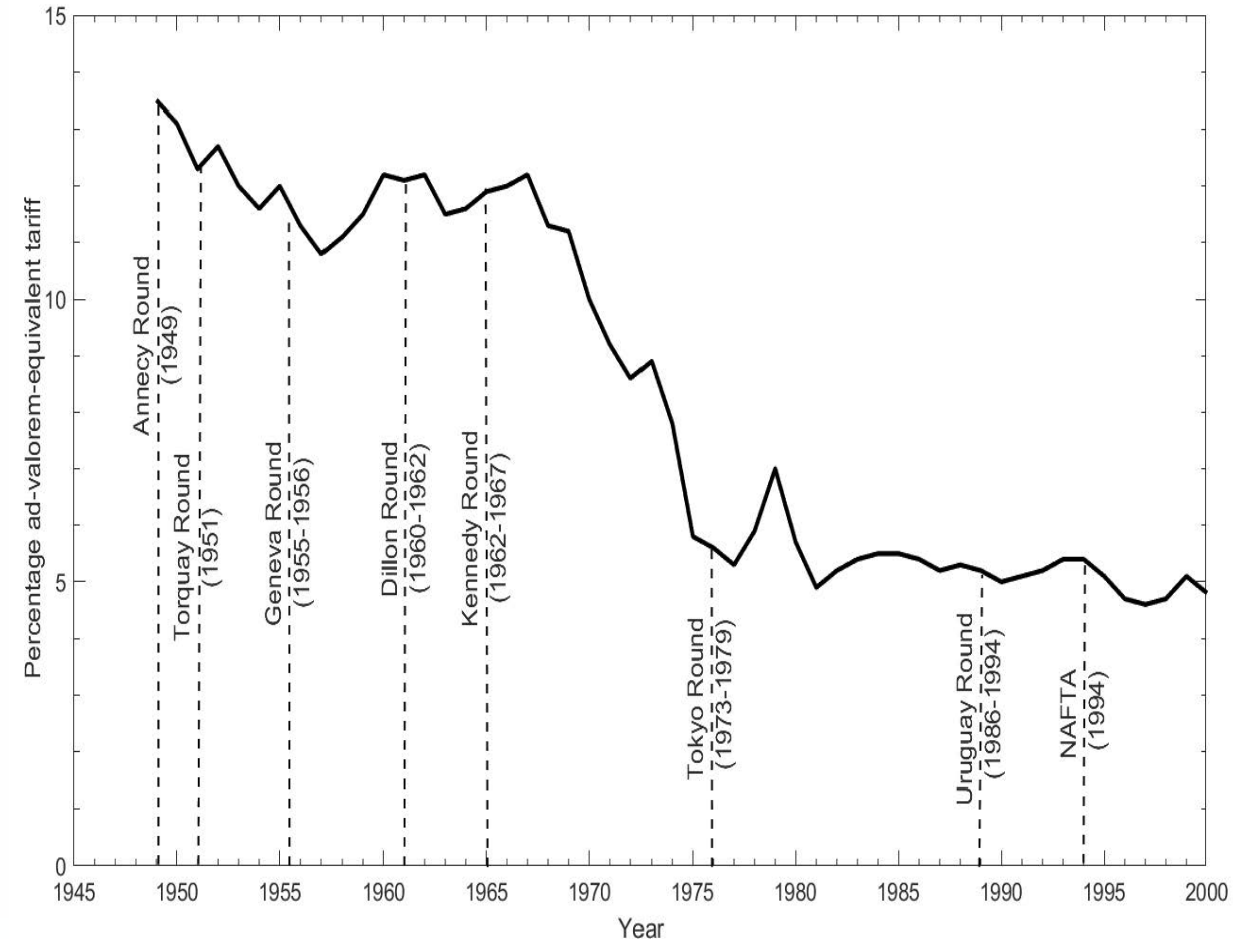
Why? Because trade generates specialization and one country may be providing a tariff concession on agriculture exports for manufacturing imports.

Customs union could be reached as tariff levels de-escalate to a symmetric free-trade area such as the Euro-area, NAFTA, etc.

A Brief Tariff History

US Tariff Rates: A Brief History

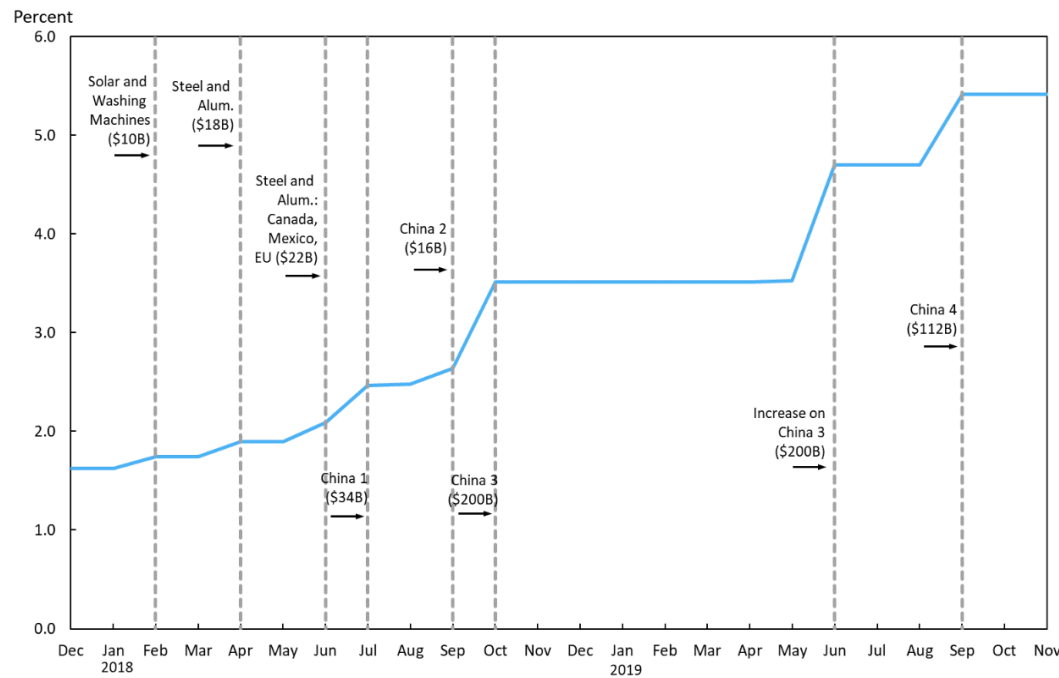
Period 1895-1945 Era of Unilateralism (except RTA in 1934) Period 1949-2016 Era of Multilateralism (mostly)



US Tariff Rates: A New Regime

Trump I (2017-2021) and Biden (2021-2025)

Figure 1: Average U.S. Tariffs by Wave of the 2018-2019 Trade War



Source: "The Impact of the 2018 Tariffs on Prices and Welfare," Mary Amiti, Stephen J. Redding, and David E. Weinstein, *Journal of Economic Perspectives* 33:4 (Fall 2019).

Trump II (2025-2029)

Country	Share of US imports (FY 2022)	Effective rate (FY 2022)	"Effective rate" (August 7, 2025)
Mexico	13.6%	0.0%	25%
China	17.1%	2.9%	30%
Canada	13.2%	0.1%	35%
Germany	4.5%	1.7%	15%
Japan	4.6%	1.6%	15%
Vietnam	4.0%	4.6%	20%
South Korea	3.6%	0.0%	15%
Taiwan	3.6%	0.0%	20%
Ireland	2.5%	1.8%	15%
India	2.7%	3.0%	50%
Italy	2.1%	3.1%	15%
United Kingdom	1.9%	1.3%	10%
Group	73.4%	1.4%	25.6%

Sources: Column 1 and 2 are author's Calculations from WITS database, Column 3 is from BBC.

Tariff Revenue

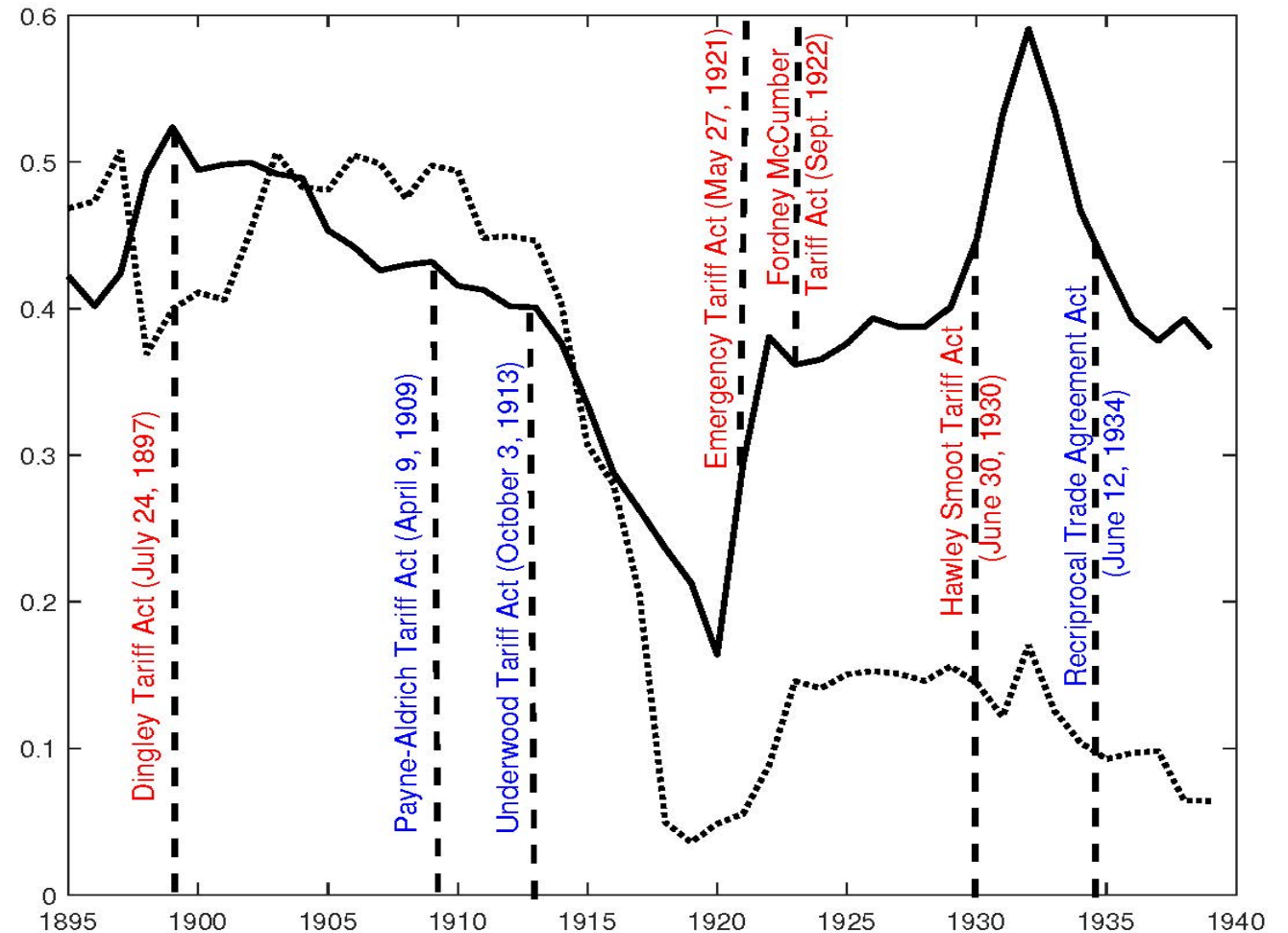
“Interwar Laffer Curves: Not So Funny.”

Crucini-Harrison-Soderbery (2025)

US Tariff Rates and Tariff Revenue as Fraction of Total Federal

Federal Income Tax Introduction and FDR Great Depression Policies Were Watersheds of Fiscal Federalism

- Tariff revenue accounted for about 45% of Federal Revenue before the introduction of the income tax
- Import trade share of GDP ~ 5%
- Labor income share of GDP ~ 60%
- Expansion of the overall tax base greatly reduced the share arising from duties.
- With the revenue constraint relaxed, tariff liberalization should have followed...



Partial Equilibrium Model of Tariff Revenue

- CES over Armington imported varieties j of goods g Cobb-Douglas nested

$$U = c_0 + \xi_X \sum_{g \in G} \phi_g \log \left(\left(\sum_{j \in J_g} (b_{jg})^{\frac{1}{\sigma_g}} (x_{jg})^{\frac{\sigma_g - 1}{\sigma_g}} \right)^{\frac{\sigma_g}{\sigma_g - 1}} \right) + \xi_D \log(D)$$

- Where b_{jg} are demand shifters for imported quantities x_{jg} with elasticity of substitution σ_g
- The import price index is $\mathcal{P}_g = \left(\sum_j b_{jg} (p_{jg})^{1 - \sigma_g} \right)^{\frac{1}{1 - \sigma_g}}$, yields demand

$$x_{jg} = \xi_X \phi_g b_{jg} (p_{jg})^{-\sigma_g} (\mathcal{P}_g)^{\sigma_g - 1} \quad (1)$$

- Important to keep track of prices: p_{jg} is the delivered price such that

$$p_{jg} = (1 + \text{AVE}_{jg}) p_{jg}^*$$

Equilibrium Expenditure, Variety j , Good g

- Equilibrium expenditure:

$$p_{jg}^* q_{jg} = \left((1 + AVE_{jg})^{-\sigma_g(\omega_g+1)} (\mathcal{P}_g^{\sigma_g-1} b_{jg} E_g)^{\omega_g+1} \eta_{jg}^{\sigma_g+1} \right)^{\frac{1}{1+\sigma_g\omega_g}}$$

- Notation Refresh:

- Elasticities: of substitution (σ_g), inverse export supply ω_g
- E_g – Aggregate expenditure on g
- p_{jg}^* – Shipped price of variety j
- q_{jg} – Imported quantity
- AVE_{jg} – Ad Valorem Equivalent
- \mathcal{P}_g – CES price index
- b_{jg} – Taste shifter in demand
- Supply Shifter (shock): η_{jg}
- Demand Shifter (price index, taste shock and expenditure):
 $\Lambda_{jg} \equiv \mathcal{P}_g^{\sigma_g-1} b_{jg} E_g$

Tariff Revenue and Laffer Curve

- To isolate the impact of tariffs, we develop an expression for the *Normalized Tariff Revenue* from good g , variety j . Rearranging terms in the revenue equation, yields,

$$R_{jg} = \underbrace{\frac{\tau_{jg}}{(1 + \tau_{jg})^{\sigma_g}}}_{\text{Demand effect}} \underbrace{\left[(1 + \tau_{jg})^{\sigma_g (\omega_g (\sigma_g - 1))} \right]^{\frac{1}{1 + \sigma_g \omega_g}}}_{\text{Export effect}} \underbrace{\left[\Lambda_{jg}^{\omega_g + 1} \eta_{jg}^{\sigma_g + 1} \right]^{\frac{1}{1 + \sigma_g \omega_g}}}_{\text{Shocks and GE effect}}$$

- The normalized revenue curve is revenue divided by the third term,

$$\tilde{R}_{jg} = \underbrace{\frac{\tau_{jg}}{(1 + \tau_{jg})^{\sigma_g}}}_{\text{Demand effect}} \underbrace{\left[(1 + \tau_{jg})^{-\sigma_g \omega_g} \right]}_{\text{Passthrough effect}} \underbrace{\left[(1 + \tau_{jg})^{\sigma_g \omega_g (\sigma_g)} \right]^{\frac{1}{1 + \sigma_g \omega_g}}}_{\text{Supply effect}}$$

- The first term is what one would get if the foreign supply curve was assumed to be infinitely elastic, $\omega_g = 0$. The small open economy case.

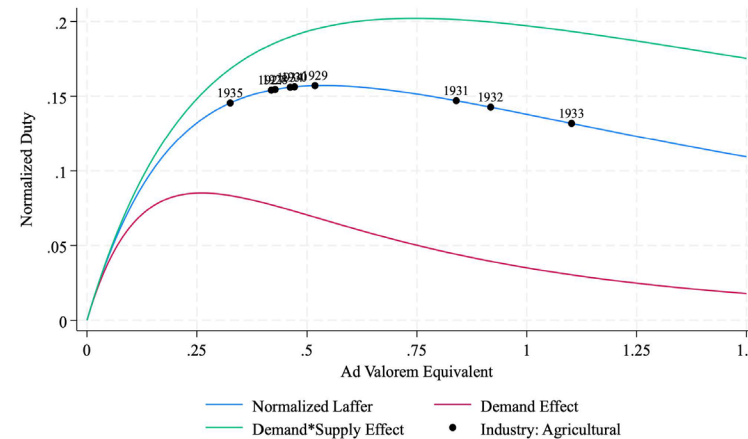
Tariff Revenue

“Interwar Laffer Curves: Not So Funny.” Crucini-Harrison-Soderbery (2025)

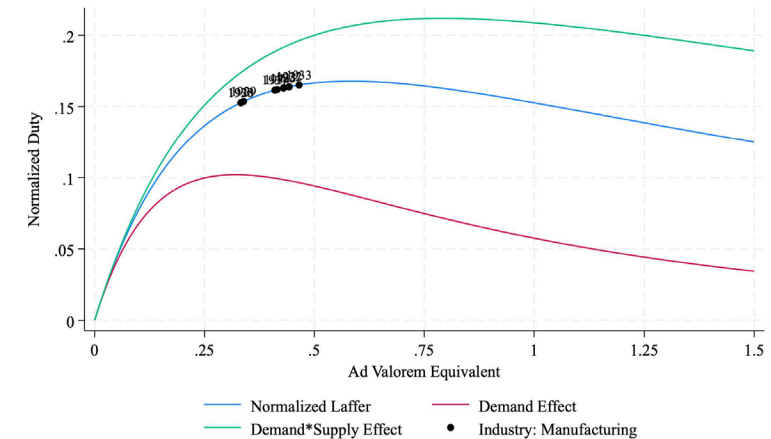
The Laffer Curves are estimated at the product level and aggregated.

The figures shows the patterns across three main traded sectors and overall.

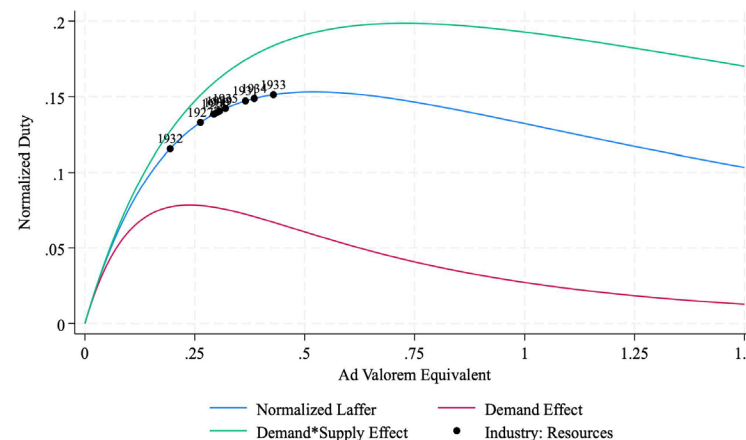
The are two margins to estimate, demand effects by US consumers and supply responses by foreign exporters.



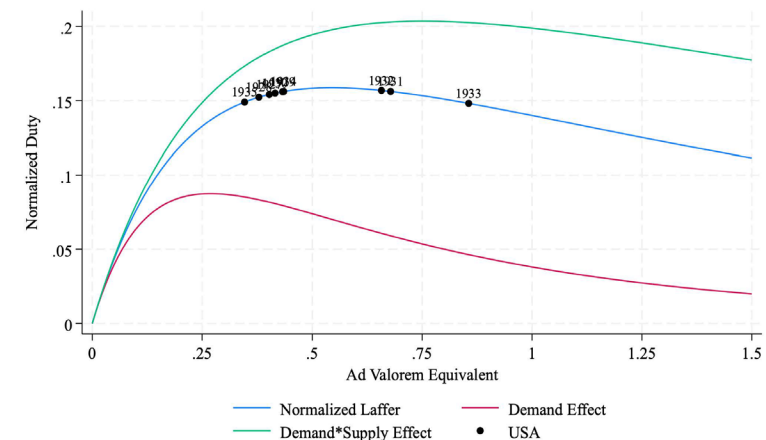
(a) Agriculture



(b) Manufacturing



(c) Resources

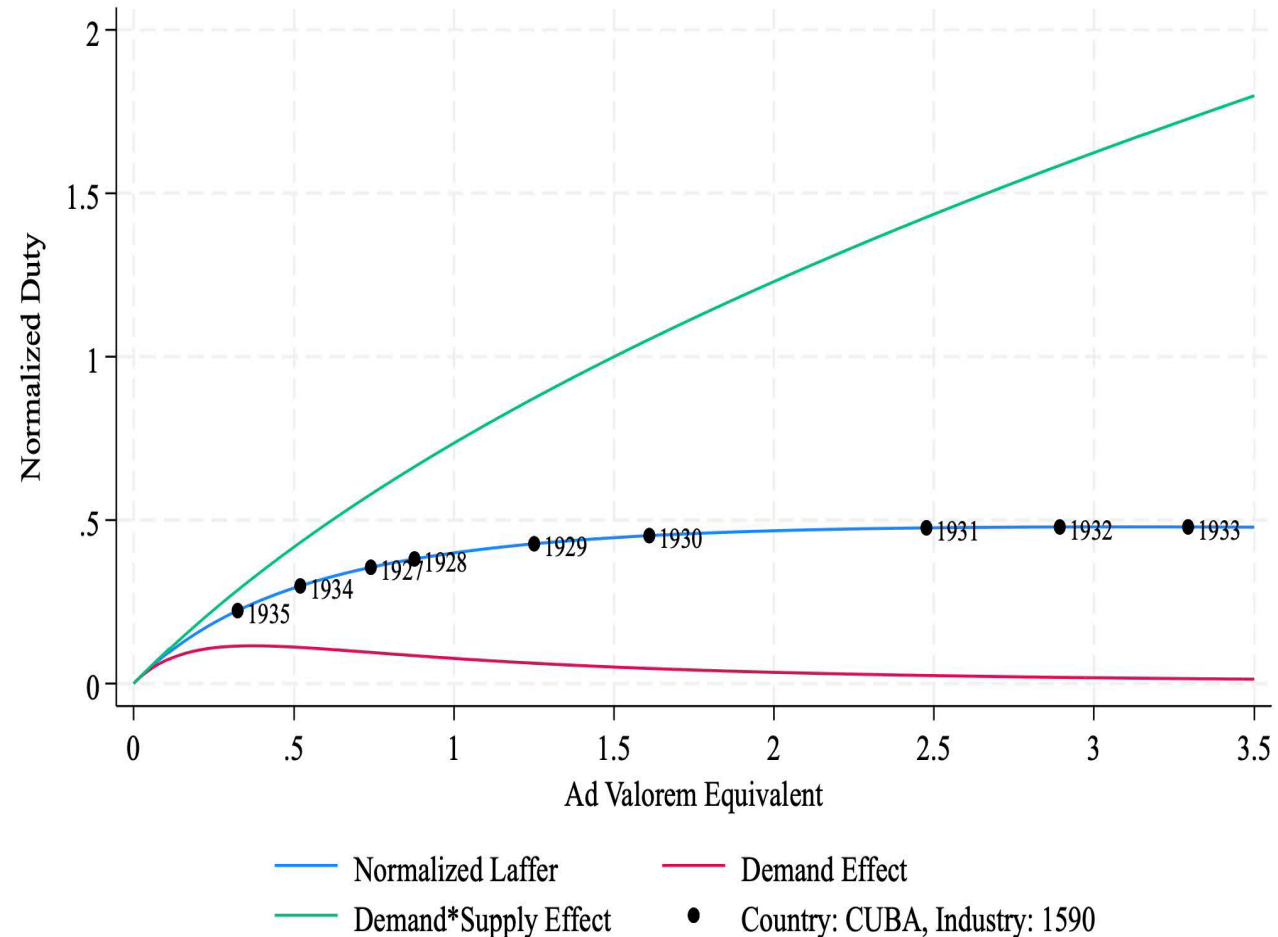


(d) US Aggregate

Most of Agricultural Tariff Revenue was from Cuban Cane Sugar

Sugar duties

- Cane sugar was one of the largest import flows and combined with high tariff, accounted for upwards of 20% of total duties in the US!
- Cane sugar tariffs in the US (and Europe) were very high to protect a high-cost alternative source of “sucrose” from sugar beets.
- Cuba was the main foreign source of cane sugar that was subject to US duties whereas the Philippines, Hawaii and Puerto Rico enjoyed duty-free status.
- **Key: Notice tariff increases beyond 100% provided negligible additional revenue.**



(a) Cane Sugar Cuban

Macroeconomic Effects

Crucini, Mario J. and James Kahn. 2007.

“Tariffs and the Great Depression Revisited.”

In Great Depressions of the Twentieth Century, edited by Timothy Kehoe and Edward Prescott, 305-334. Minneapolis, MN: Federal Reserve Bank of Minneapolis.

Macroeconomic Effects of Trade Policy

What are main channels through which a tariff impacts on trade and the overall macroeconomy?

The three main channels are:

1. Supply-side efficiency effects (substitution of domestic and imported intermediate inputs by firms)
2. Demand-side substitution effects (substitution across final goods by consumers)
3. Non-tariff monetary and fiscal policy responses
 - These effects are different for symmetric and asymmetric tariff wars
 - These effects are different for small and large economies

Macroeconomic Effect of Trade Policy

Consumers, Firms and General Equilibrium Market Clearing Conditions

Preferences:

$$\begin{aligned} E(U) &= E_0 \sum_{t=0}^{\infty} \beta^t U(C_{1t}, C_{2t}, C_{3t}, L_t) \\ U(C, L) &= \log C_t + \kappa L_t \\ C &\equiv [b_1 C_1^{-\gamma} + b_2 C_2^{-\gamma} + b_3 C_3^{-\gamma}]^{-\frac{1}{\gamma}} \end{aligned}$$

Time resource constraint:

$$1 - L_t - N_{1t} - N_{2t} - N_{4t} \geq 0$$

Sector-level Production Functions:

$$Y_{it} = F(K_{it}, N_{it}) = K_{it}^{\alpha_i} N_{it}^{1-\alpha_i}, \quad i = 1, 2, 4. \quad (13)$$

Armington Aggregation of US and Foreign Materials:

$$M_t = G(m_{hht}, m_{fht}) = [\psi m_{hht}^{-\sigma} + (1 - \psi) m_{fht}^{-\sigma}]^{-1/\sigma} \quad (14)$$

Capital Accumulation and Sector Capital Allocations:

$$K_{t+1} = (1 - \delta)K_t + I_t = K_{1t+1} + K_{2t+1} + K_{4t+1} \quad (15)$$

Traded material supplies (perishable) exhausted across uses:

$$\begin{aligned} M_t &= \theta_1 Y_{1t} + \theta_2 Y_{2t} + \theta_4 Y_{4t} \\ M_t^* &= \theta_1 Y_{1t}^* + \theta_3 Y_{3t}^* + \theta_4 Y_{4t}^* \end{aligned}$$

Traded consumer goods/materials (perishable) exhausted across uses:

$$\begin{aligned} Y_{2t} &= C_{2t} + C_{2t}^* & Y_{4t} &= m_{hht} + m_{hft} \\ Y_{1t}^* &= C_{1t}^* + I_t^* & Y_{4t}^* &= m_{fft} + m_{fht} \end{aligned}$$

Non-traded consumption-investment good exhausted across uses:

$$\begin{aligned} Y_{1t} &= C_{1t} + I_t \\ Y_{3t}^* &= C_{3t} + C_{3t}^* \end{aligned}$$

Macroeconomic Effect of Trade Policy

Isomorphism Between Efficiency Effect of Tariffs on Intermediates and Macroeconomic Production

$$\sum_{s=t}^{\infty} Z_{ts} [F(K_s, N_s, M_s) - w_s N_s - r_s K_s - p_{ms} M_s] \quad (21)$$

With Leontief materials ($M_s = \theta Y_s$) this becomes:

$$\sum_{s=t}^{\infty} Z_{ts} [(1 - \theta p_{ms}) F(K_s, N_s) - w_s N_s - r_s K_s] \quad (22)$$

Efficiency conditions in trade model:

$$(1 - \theta p_{mt}) D_2 F(K_t, N_t) = w_t \quad (23)$$

$$(1 - \theta p_{mt}) D_1 F(K_t, N_t) = r_t \quad (24)$$

Analogous conditions in prototype model:

$$A_t D_2 F(K_t, N_t) = w_t \quad (25)$$

$$A_t D_1 F(K_t, N_t) = r_t \quad (26)$$

Macroeconomic Effect of Trade Policy

Productivity Effects in Small vs Large Economies

Small Open Economy – foreign price is unaffected

Tariff acts like a tax wedge: $A_t = (1 - \theta p_{mt})$.

Import price: $p_{mt} = (1 + \tau_{mt})p_m^*$,

$$\begin{aligned} A_t &= (1 - \theta(1 + \tau_t)) \\ \hat{A}_t &\equiv -\varphi \hat{\Omega}_t \end{aligned}$$

where $\Omega_t \equiv 1 + \tau_t$ and $\varphi \equiv \theta/(1 - \theta(1 + \tau))$

- $\tau_0 = 10\%$, $\theta = 0.2$, $\varphi = 0.256$.
- $\tau_0 = 10\% \rightarrow \tau_1 = 60\%$
- $\hat{A}_t = 9.6\%$
- $\hat{y}_t = 14\%$

Large Open Economy – foreign price is affected

First-order condition for choice of imported materials relative to domestic materials:

$$D_2 G(m_{hht}, m_{fht}) = (1 + \tau_t) p_{4t}^* / p_{mt} \quad (28)$$

Gives an efficiency wedge equation:

$$A_t = 1 - \theta \frac{(1 + \tau_{4t})}{D_2 G(m_{hht}, m_{fht})} \quad (29)$$

Macroeconomic Effect of Trade Policy

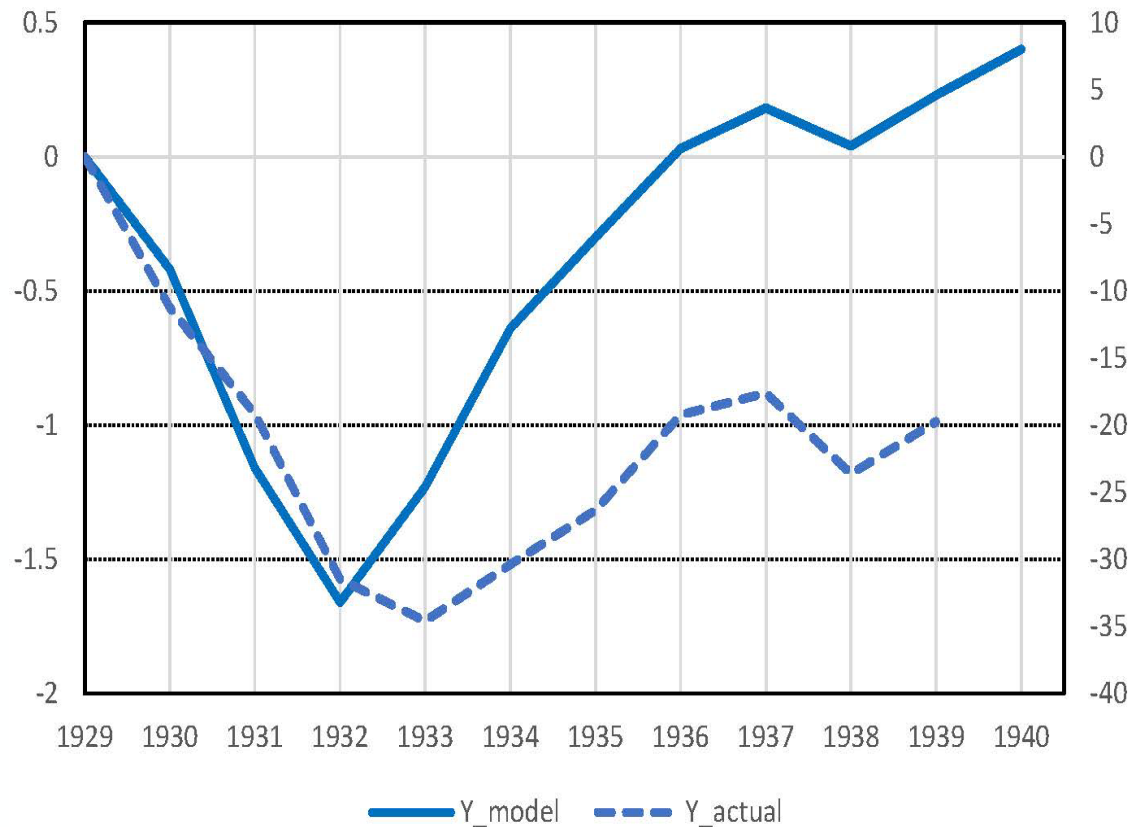
Difference Between Small and Large is Effectively About Base-Broad Trade War

- The home country (and the foreign country) are both large.
- Thus, when the home country increases a tariff, it reduces the relative price of the good it taxes (here, foreign materials).
- Further, if the tariff war is symmetric in the sense that each country's tariff would have a similar terms-of-trade effect in isolation, they cancel each other out.
- The result is to make imported materials more expensive relative to domestic materials in both countries and this results in expenditure switching toward home materials and thus inefficiencies in downstream production that utilizes these inputs.

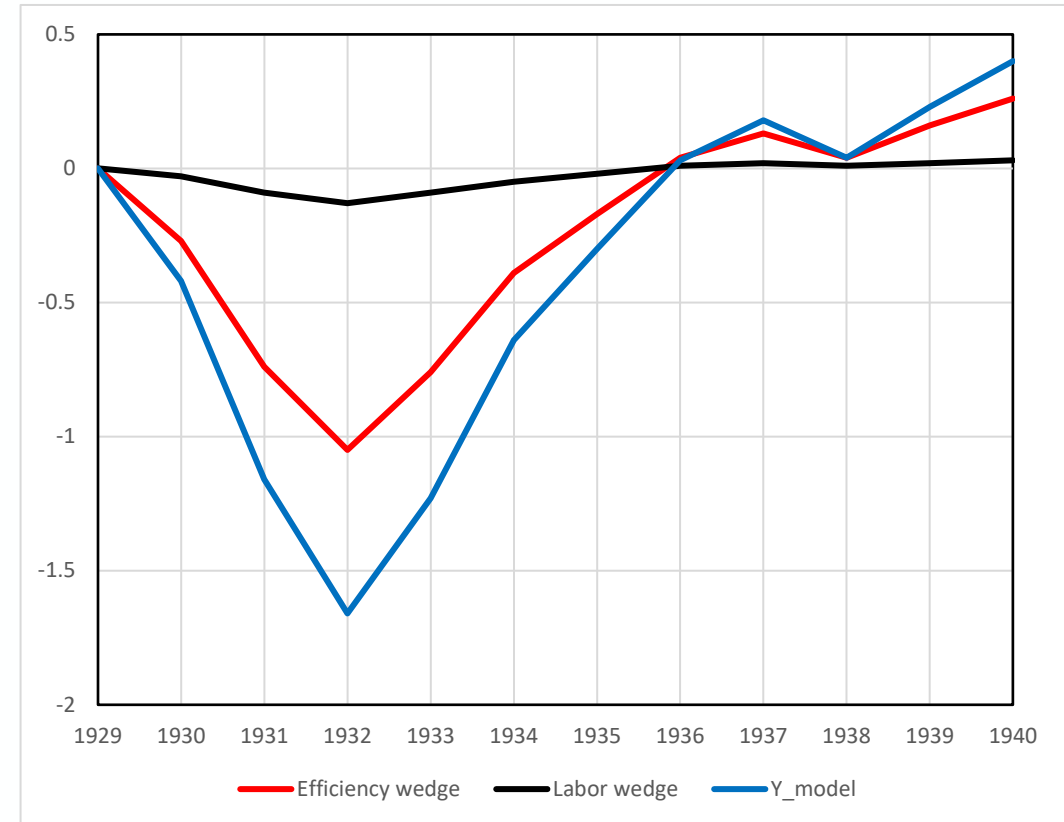
Channels of Macroeconomic Effects 1.0

Symmetric Tariff War: Consumer expenditure switching and firm production inefficiencies

Actual and Simulated US GDP



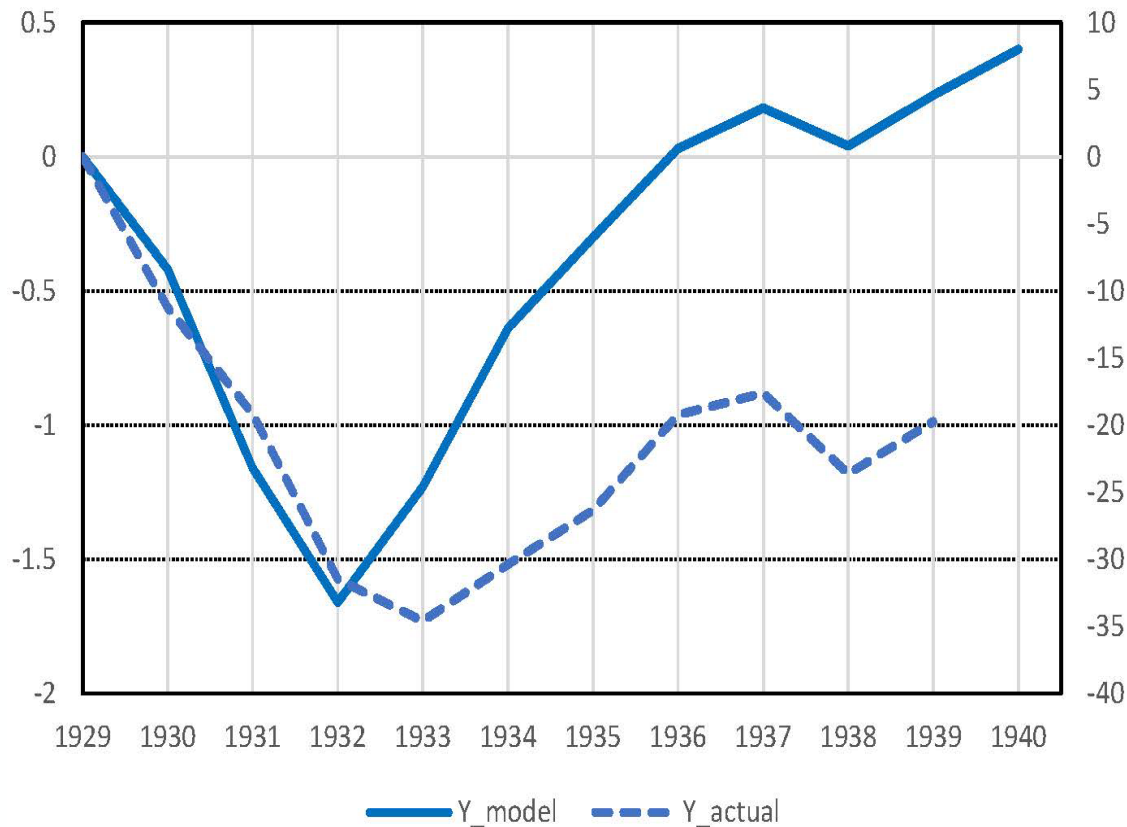
Demand Channel and Supply Channel



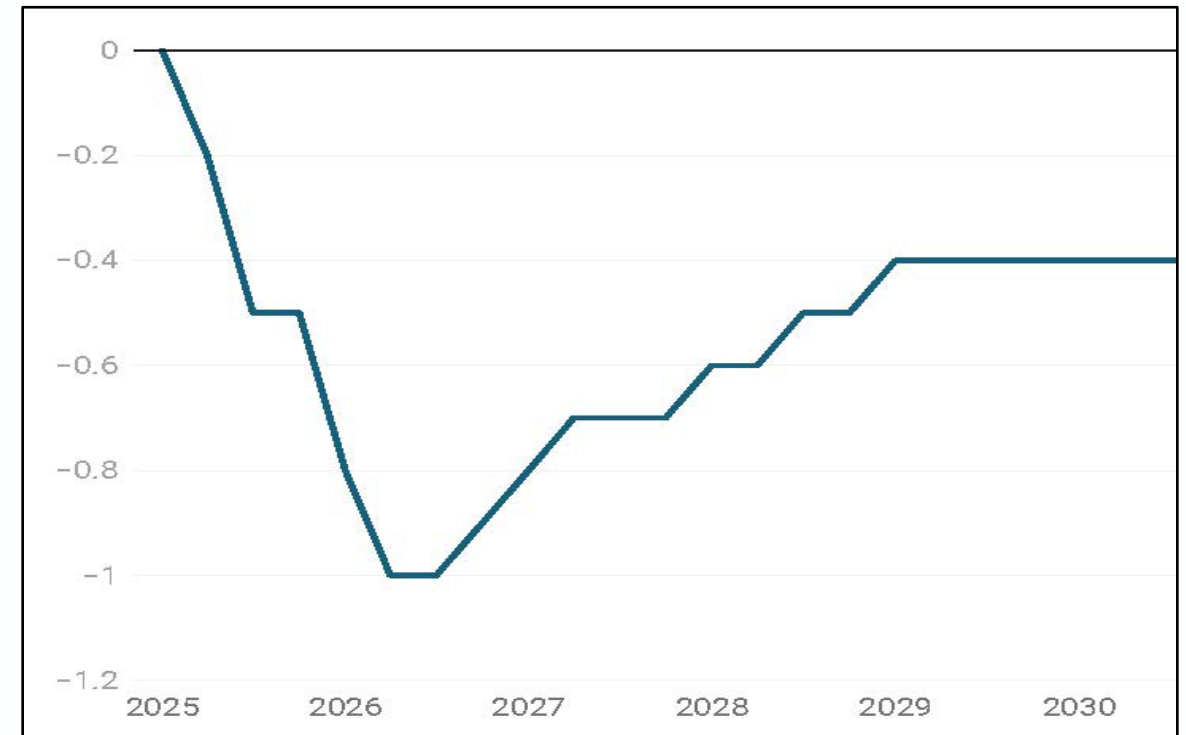
Macroeconomic Effects 1.0

Comparison of Then and Now

Actual and Simulated US GDP from Crucini-Kahn (2007)



Simulated US GDP from Yale model (2025)



Macroeconomic Effects – 2.0

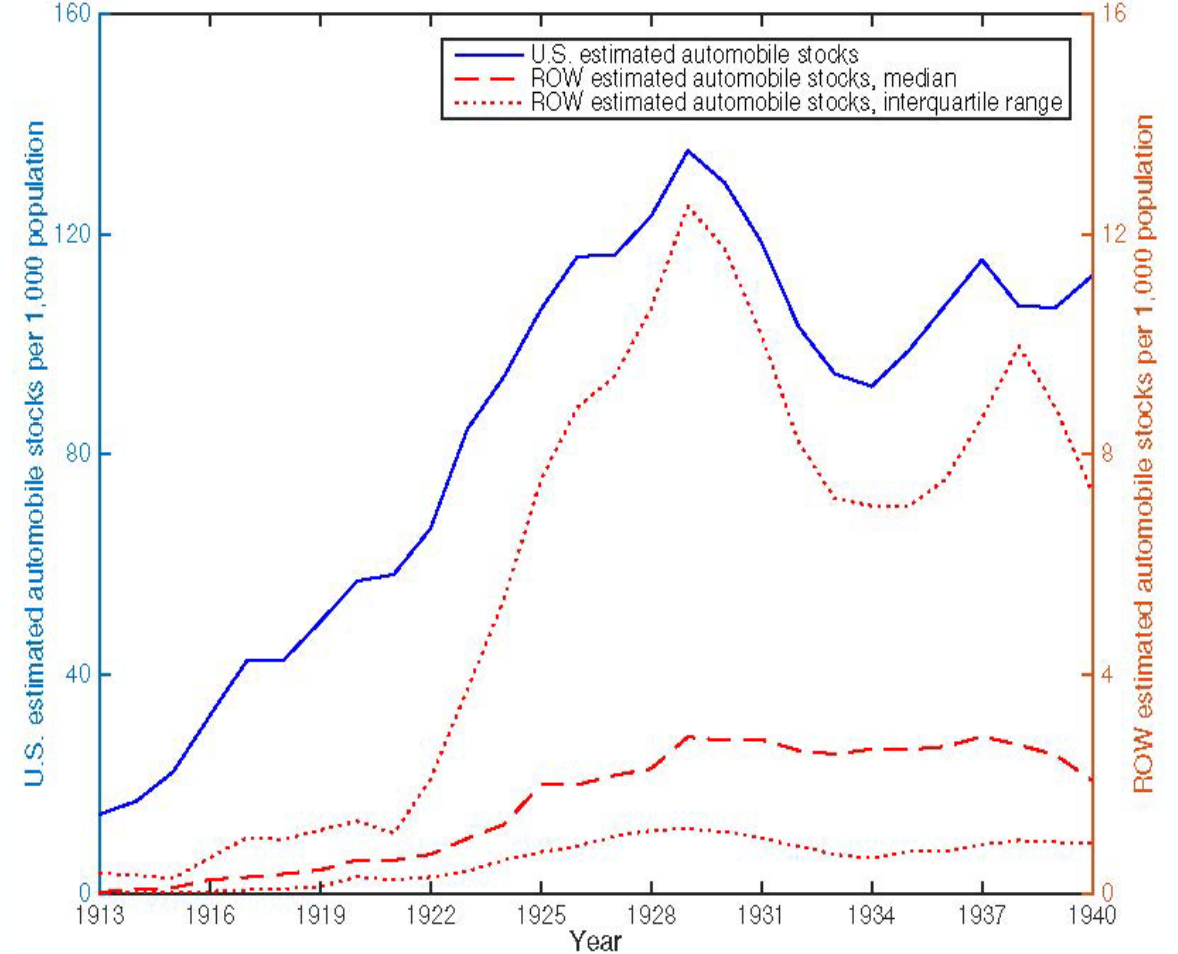
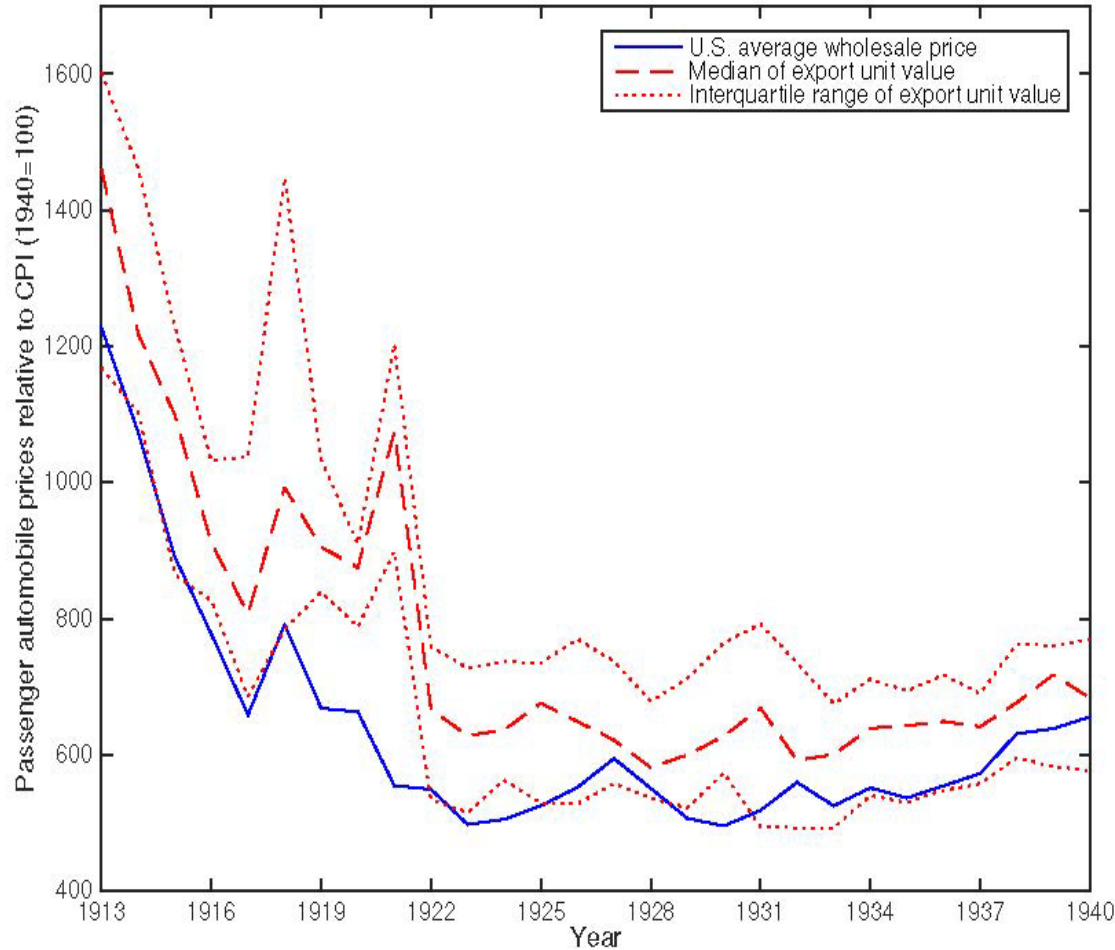
What Does a Tariff Do in Terms of Product and Technological Diffusion?

The Model T
Ford's
nominal price
fell 62% in 13
years (1908-
21) and the
market flipped
just as fast.



Macroeconomic Effects – 2.0

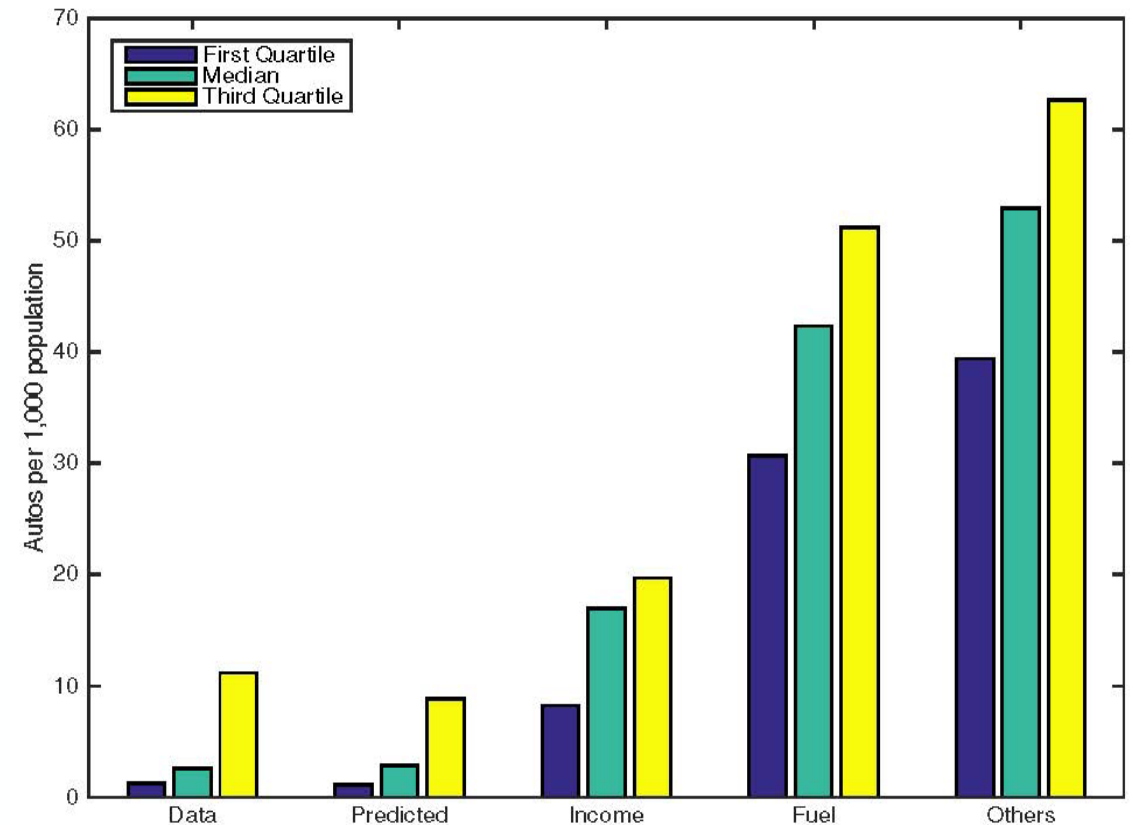
Early 20th century American exceptionalism: Production, trade and diffusion of the automobile
(Cheng, Crucini, Oh and Yilmazkuday, Journal of International Economics, 2025)



Macroeconomic Effects – 2.0

Counterfactuals to account for the massive automobile adoption gap

Country	Individual wedges				
	Fuel	Retail	Customs	Shipping	Destination
	Tax (1 + κ_j)	Distribution (1 + μ_j)	Duty (1 + τ_j)	Cost (1 + s_j)	Markup (1 + q_j)
Panel A: Automobile producing countries					
Canada	1.90	1.07	1.39	1.06	1.29
France	2.39	1.19	1.45	1.14	1.54
Italy	2.60	1.44	1.31	1.19	1.12
United Kingdom	2.09	1.08	1.33	1.22	1.24
Panel B: European countries					
Denmark	2.05	1.12	1.07	1.27	0.98
Greece	2.60	1.45	1.07	1.22	1.37
Norway	1.89	1.19	1.15	1.17	1.25
Portugal	2.25	1.58	1.36	1.17	1.40
Spain	2.25	1.21	1.26	1.17	1.40
Sweden	2.02	1.19	1.15	1.23	1.15
Switzerland	2.37	1.16	1.05	1.16	1.36



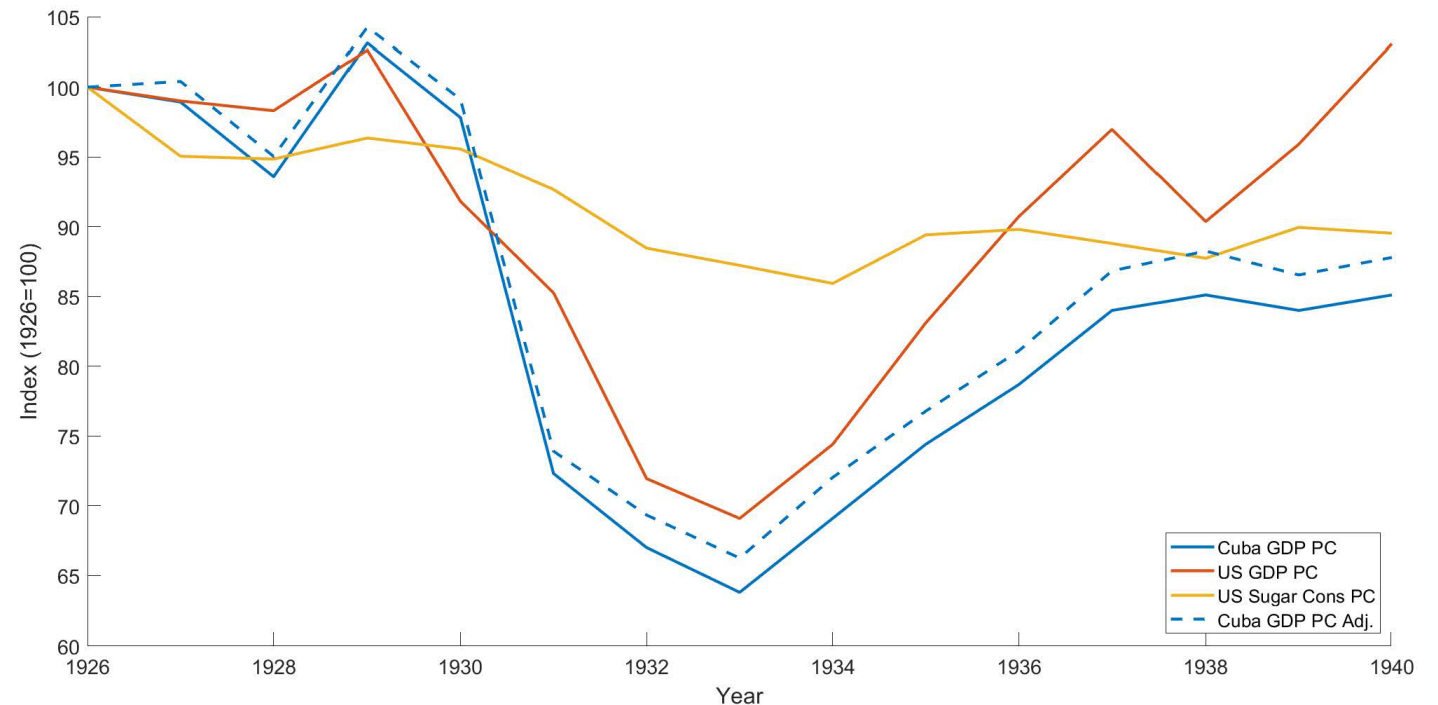
Channel of macroeconomic Effects 3.0

Terms of trade effects on commodity dependent countries? Crucini and Harrison (2025)

CUBA was...

FIGURE: Per Capita GDP and Sugar Consumption

- Commodity dependent: 36-48% of GDP from sugar (25% of world sugar exports)
- Tied to the US economy: 76% of Cuban sugar exported to USA (also fixed exchange rate)
- Subjected to high and variable duties: 1) Sugar tariff revisions 1909, 1913, 1921, 1922, 1930 and 1934; 2) Nominally sticky specific duties.
- Recently attended a joint Bank of Canada – ECB conference where the Canadian steel industry was similarly characterized.



Channel of macroeconomic Effects 3.0

Terms of trade effects on commodity dependent countries? Crucini and Harrison (2025)

FIGURE: Sugar Prices Relative to US WPI

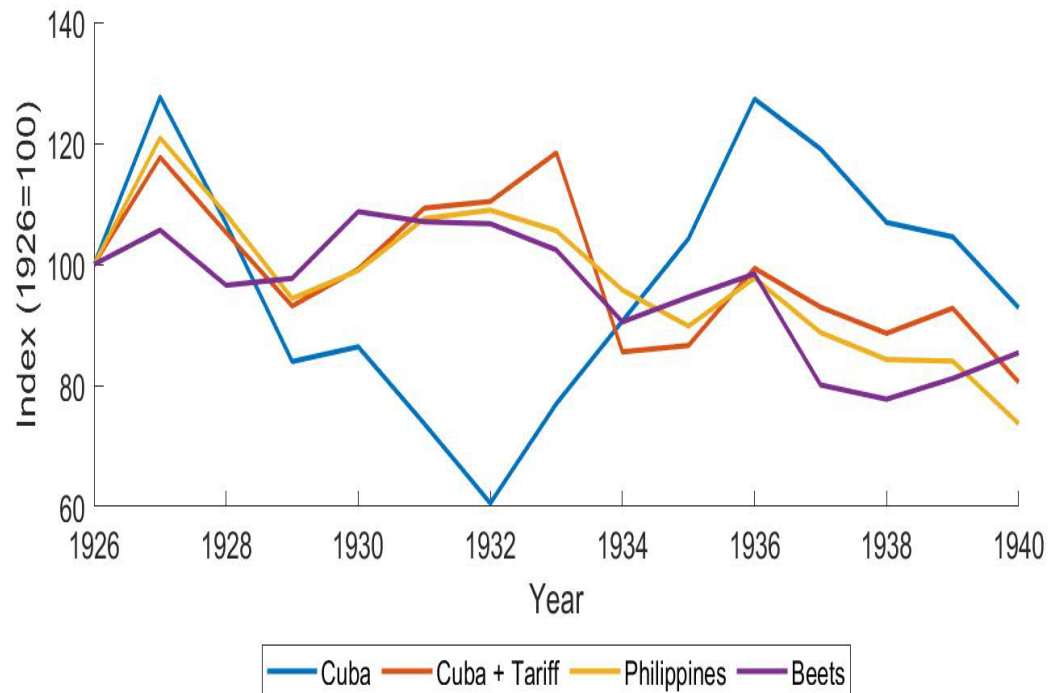
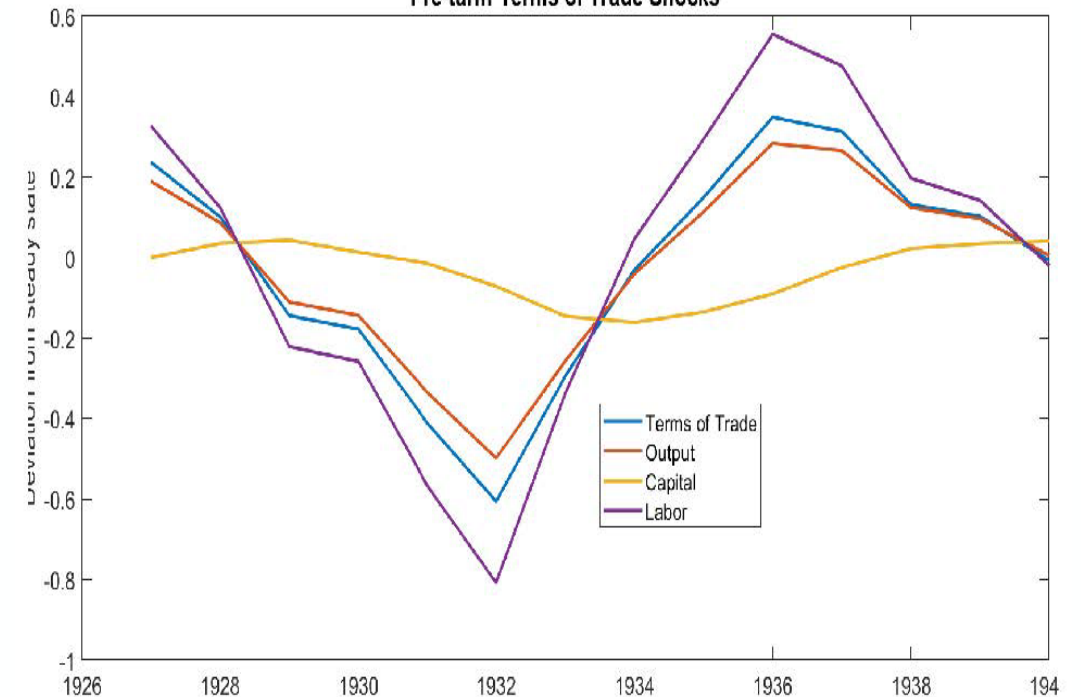


Figure 10. Simulation of Cuban Sugar Production and Inputs
Pre-tariff Terms of Trade Shocks



Summary

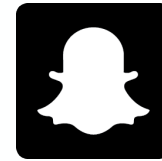
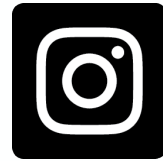
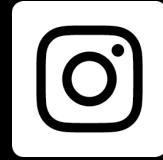
- US tariff history reveals dramatic changes in tariff levels during the period of Congressional tariff-making.
- Until Trump's first administration the US was a leader in tariff de-escalation to aggregate effective tariff levels that were near zero in many parts of the world (caution: agricultural duties are very high in parts of the world, 40% in India, for example).
- Tariff war of the 1930's plausibly generated a post-World War II magnitude US and global recession, not a Great Depression.
- Tariffs were an important source of revenue, but this skewed toward goods with inelastic demand and supply, Cuba cane sugar being the prime historical example. Sugar tariffs devastated the Cuban economy and may have played a role in revolution. Inefficient beet sugar producers benefited and consumers lost.
- Could tariffs on particular items be more efficient on the margin than income or corporate taxes? Possibly, but they are rife with political intentions that often snowball to larger inefficiencies as we saw during the Great Depression. A broad consumption tax would be more efficient.
- Tariffs on US low-priced autos (e.g., Ford Model T) by foreign countries (who produced high-priced luxury models) severely delayed adoption of a key consumer product and liberalizing source of transportation. This resonates with the imposition of tariffs on lost cost EVs (e.g., China, among others) in the modern era.

Thank You

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Design Elements



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