Gravity's Politics

Theo Serlin*

July 2, 2024

Abstract

Across contexts, trade flows decline with geographic distance. This paper explores the implications of that fact for politics. In a multi-region model of trade, differences in trade costs create uneven gains and losses from liberalization. This heterogeneity provides a basis for political divisions over trade policy, even in the absence of sector or factor differences. Some areas gain from lower prices and export opportunities, but regions that sell into those areas face greater competition. I calibrate this model to data on regional trade flows in the US to quantify these uneven gains and losses. This new measure captures different variation than commonly-used measures of trade exposure that ignore the geographic context. The modeled gains from liberalization are predictive of support for trade by voters and legislators, including in specifications that exploit within-unit variation in trade gains with different partners. Spatial frictions to trade create spatial cleavages over trade.

*Stanford University, tserlin@stanford.edu. I am grateful to Avi Acharya, Vicky Fouka, Judy Goldstein, Bobby Gulotty, Rebecca Perlman, Jonathan Rodden, Ken Scheve and participants in the Stanford-Berkeley IPE Colloquium for comments on this project.

From ancient Assyria to eBay, trade flows follow the gravity equation (Barjamovic et al., 2019; Hortaçsu, Martínez-Jerez and Douglas, 2009). Scholarship since Tinbergen (1962) has documented that trade flows are proportional to country sizes and decline sharply with geographic distance. The left panel of Figure 1 shows this pattern, plotting US exports, normalized by the GDP of the receiving country, against geographic distance. The extent of US trade with Canada indicates the importance of distance-related trade costs for trade flows, relative to the differences in factor endowments and technology that provide the basis for trade in neoclassical models. The same gravity structure holds within countries. The right panel of Figure 1 plots manufacturing freight shipments from San Francisco, normalized by total shipments to the destination, against distance, and shows if anything a stronger effect of distance in internal than in international trade. These distance-related trade costs influence which regions of a country export, and where they export. Figure 2 plots the log share of shipments exported to Mexico and Canada from different parts of the US against the producer's geographic latitude, in two industries. Manufacturers further north export a larger share of production to Canada, those further south trade more with Mexico.

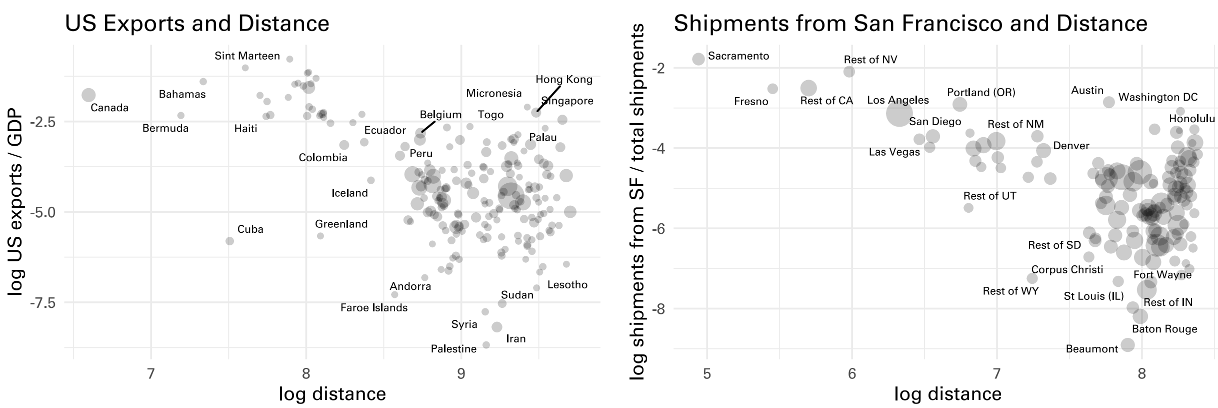

Figure 1: Gravity in US External (left) and Internal (right) Trade

The left panel shows US exports divided by destination GDP plotted against distance, using data from Fouquin and Hugot (2016). The right panel shows shipments from manufacturers in San Francisco to other zones of the US in the Commodity Flow Survey. Data in both figures is for 2017.

This paper analyzes the implications of gravity for the politics of trade. Because distance is important for trade, internal geography conditions the gains from trade and political divides over trade policy. Locations close to international gates benefit from opportunities to export and access to imports. Those towards the interior experience fewer of these benefits, and are harmed by liberalization as the goods they sell to coastal regions compete with imports. If the gains and losses from trade influence support, we would expect voters in regions with better access to world markets to be more supportive of liberalization, and those in regions with worse access to be less supportive. Geographic variation in the gains from and support for trade is distinct from geographic variation in the mix of industries. Figure 2 shows variation in trade with Mexico and Canada within the paper and primary metal industries.

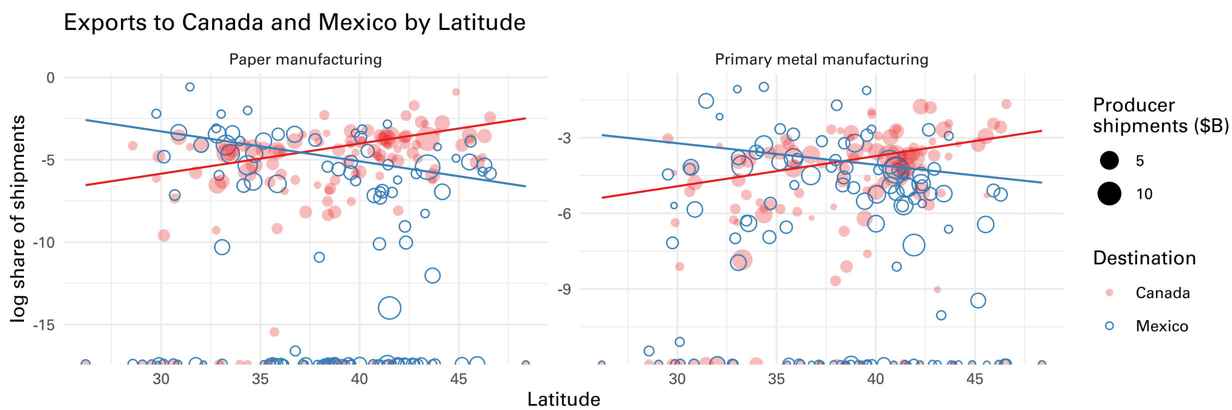

Figure 2: Within-industry spatial variation in exporting to Canada and Mexico

This figure plots the log share of shipments of paper (NAICS 322, left panel) and primary metal manufactures (NAICS 331, right panel) from each Commodity Flow Survey zone to Canada and Mexico against latitude, omitting Alaska and Hawaii. The lines are fitted values from a Poisson regression. The size of points corresponds to the total value of shipments from that location. Data is from shipments from producers in the 2017 Commodity Flow Survey.

This paper develops and tests these intuitions in three parts. The first part analyzes distributional conflict in a class of trade models that rationalize the gravity equation. Following Anderson (1979), a number of different theoretical models have been proposed that allow trade flows to be written as follows:

$$\ln X_{od} = \delta_o + \delta_d - \theta \ln \tau_{od} \tag{1}$$

where X_{od} are exports from o (for origin) to d (destination), δ_o and δ_d are bundles of attributes specific to o and d, respectively, τ_{od} is the cost of shipping goods between o and d, and θ is the "trade elasticity" which governs how strongly trade flows respond to trade costs. In these models, locations trade for different reasons.[1] However, Arkolakis, Costinot and Rodríguez-Clare (2012) show that despite these differences, the welfare effects of trade are equivalent in these models, and in a general class of models characterized by a constant

[1] Anderson (1979) and Anderson and Van Wincoop (2003) make the Armington assumption that each location produces a differentiated product. In Eaton and Kortum (2002) each location's productivity differs across varieties of products. In Krugman (1980) increasing returns to scale and product differentiation provide a rationale for trade. Melitz (2003) and Chaney (2008) extend the Krugman framework to include heterogeneous firms.

elasticity of substitution demand system and the gravity equation. I borrow their terminology in referring to these models as "gravity models."

I combine a Mayer (1984) political economy with a multi-region gravity model. Reducing tariffs creates larger benefits for regions with lower initial costs of accessing the global economy. Heterogeneity in the gains from trade, combined with voters having non-material preferences over tariff policy, is sufficient to generate geographic political divides over trade. Depending on the configuration of trade costs, reducing tariffs can also generate welfare losses for some regions. These losses occur despite the absence of the industry or factor differences that drive conflict in canonical international political economy models (Alt and Gilligan, 1994; Rogowski, 1989; Hiscox, 2002).

The second part uses the model to measure which parts of the US gain from liberalization. I calibrate the model to data on regional trade flows for the US in 2017, and simulate how reductions in trade costs with different parts of the world affect welfare in different regions. This approach uses observed trade flows to infer trade costs and provide the model's comparative statics predictions of the gains from liberalizing trade with different partners for different parts of the US. These gains are heterogeneous across space. For instance, a zone in the 90th percentile gains around 4.4 times more than one in the 10th percentile from a given reduction in trade costs with Eastern Asia. Reductions in trade costs create aggregate welfare gains, but some cases of bilateral liberalization, such as with Latin America, create welfare losses for some US regions. This measure of gains from liberalization is driven by geographic variation in trade costs. Locations on the Pacific coast gain most from trade with Eastern Asia, those on the Gulf of Mexico gain most from trade with Latin America. The measure captures a distinct source of variation to variables commonly used in the literature, which allocate industry-level shocks to regions based on employment (Topalova, 2010; Autor, Dorn and Hanson, 2013; Kovak, 2013). Regions that experience larger gains from liberalization tend to have a larger share of employment in import-competing industries.

The third part links measured gains from liberalization to support for trade among voters and legislators. Very different parts of the US gain from liberalization with different world regions. This heterogeneity allows me to exploit within-unit variation in gains from and support for liberalization, and so hold fixed unobservable factors that influence support for all forms of liberalization in a given location. Voters in parts of the US that gain from liberalization with Latin America are more supportive of trade agreements with Central America and with Peru and Colombia, but are no more supportive of trade with Korea or China. Voters in parts of the US that gain from trade with Eastern Asia are more supportive of trade with Korea and China, relative to trade with Latin America. The estimated relationship between gains from liberalization and support for trade is large. A two standard deviation increase in gains from liberalization corresponds to an increase in support for trade around 44% of the college-non college gap, and around 150% of the gender gap. I document larger effects using measures of internal trade barriers, which test the model's qualitative prediction that internal geography conditions the politics of trade.

It is not just that voters in locations that gain from liberalization are more supportive of trade, their representatives are as well. Comparing the same legislator voting on different Free Trade Agreements that have different implications for their district, I find that legislators are more supportive of bills that benefit their district.

This paper contributes to three literatures. First, it contributes to the vast literature on the sources of divisions over trade policy. Foundational contributions by Mayer (1984) and Rogowski (1989) derived voters' preferences from the distributional consequences of trade in specific factors and Heckscher-Ohlin models of trade. Rogowski (1989) argued that the relative abundance of land, labor, and capital determine which electoral coalitions form in a given society. Hiscox (2002) argued that the extent to which factors can reallocate across industries influences whether divides over trade policy fall along factor or industry lines. In relation to these contributions, this paper analyzes how internal trade costs create cleavages over trade. It shows that trade can still be contentious even in the absence of industry or factor differences, and that preferences within these groups are heterogeneous. This contribution complements recent scholarship that explores the consequences of heterogeneity in productivity across firms in the same industry for trade policy (Kim, 2017; Osgood, 2017). That literature largely focuses on firm lobbying rather than mass politics, the focus of this paper.[2] This paper's focus on geography as a source of distributional consequences differs from other work on political geography and trade policy. Busch and Reinhardt (1999, 2000), McGillivray (2004), and Rickard (2018) explore the distinct issue of how the spatial distribution of industries affects their ability to mobilize and receive political benefits. Schonfeld (2021), Helms (N.d.), and Scheve and Serlin (2024) analyze how internal migration affects trade policy coalitions.

Second, the paper contributes to scholarship that measures the economic and political effects of exposure to trade across regions. Autor, Dorn and Hanson's (2013) study of the negative effects of trade with China on US labor markets has prompted much recent work on the political effects of negative economic shocks (for instance Autor et al. 2020; Ballard-Rosa et al. 2021 and Baccini and Weymouth 2021). In this literature, imports and tariff changes have negative effects on regions specializing in affected industries. Analyses of the welfare effects of Chinese import competition similarly assume that the benefits to firms and consumers from cheaper prices are geographically diffuse (Caliendo, Dvorkin and Parro, 2019; Galle, Rodríguez-Clare and Yi, 2023). This paper introduces a theoretically-motivated measure of

[2]Notable exceptions to that tendency are Lee and Liou (2022) and Walter (2017).

the gains from liberalization that identifies off variation in trade costs, not industry mix. This measure generalizes recent scholarship from international economics that attempts to measure the aggregate gains from trade in a broad array of models to a multi-region context (Arkolakis, Costinot and Rodríguez-Clare, 2012; Costinot and Rodríguez-Clare, 2014). It highlights how the gains, as well as the losses, from imports are unevenly distributed across space and have political consequences. In focusing not just on the losses from import competition when considering the mass politics of trade, this paper builds on Baker's (2003) and Naoi and Kume's (2015) work on consumption and support for openness and on scholarship on firms in the politics of trade, which discusses how productive and multinational companies resist protectionism (Milner, 1988; Kim, 2017; Osgood, 2017).

Third, this paper contributes to scholarship on individual trade policy preferences. Initial research on trade policy preferences analyzed whether factor or industry-based models of trade were more predictive of trade preferences (Scheve and Slaughter, 2001; Mayda and Rodrik, 2005). This scholarship found strong evidence of more educated voters—who stand to gain from trade under a skill-based Heckscher-Ohlin model—being more supportive of trade, and less evidence of differences between industries driving trade preferences. These findings provided a basis for Open Economy Politics theories that begin by deriving voters' preferences from economic models (Lake, 2009). This approach has been criticized by scholars who point out that education may affect trade preferences through other channels such as economic ideas and cosmopolitanism (Hainmueller and Hiscox, 2006; Mansfield and Mutz, 2009), and that voters are unfamiliar with the two-factor two-industry Heckscher-Ohlin model (Rho and Tomz, 2017).[3]

This paper shows a link between trade preferences and economic interests as derived and measured using the gravity model. It builds on scholarship that derives voter preferences from economic models, but—recognizing criticisms of that literature—illustrates the importance of alternative models to Heckscher-Ohlin for understanding those preferences. The estimated effects of gravity-derived gains on trade preferences are comparable to those of education, or other variables predictive of trade preferences such as gender (Guisinger, 2017). A number of features of the gravity model make it a good candidate for measuring voters' self-interest. Unlike Heckscher-Ohlin, it is consistent with various foundations for trade (not just factor differences), can rationalize intra-industry trade, and closely fits observed trade patterns.[4] In its various forms, the gravity model forms the basis of much recent empirical trade scholarship. For instance Donaldson (2018), Caliendo and Parro (2015) and Caliendo, Dvorkin and Parro

[3]Note however that research on support for trade in lower-income countries finds the opposite relationship between education and support for trade, consistent with the gains from trade in a Heckscher-Ohlin model (Mayda and Rodrik, 2005; Jäkel and Smolka, 2017).

[4]See Trefler (1995) on the poor fit of the Heckscher-Ohlin model to trade patterns.

(2019) use versions of Eaton and Kortum (2002) to quantify the effects of railway construction, NAFTA, and the China Shock, respectively. This paper reinforces Owen and Johnston (2017), Walter (2017), and Lee and Liou (2022) in finding a positive relationship between the net benefits from trade under alternative models to Heckscher-Ohlin and support for trade.

This paper's contribution is orthogonal to debates about the importance of cultural and sociotropic concerns for trade preferences. Recent scholarship has focused on how anxieties about cultural change (Margalit, 2012), fairness concerns (Lü, Scheve and Slaughter, 2012), ethnocentrism, and sociotropism (Mansfield and Mutz, 2009), influence trade preferences. This paper's focus on an alternative link between the distributional effects of trade and support for liberalization is entirely compatible with cultural mechanisms also being important. In the model, the welfare effects of trade liberalization are equal for all people in a given area, and so egocentric or locally-sociotropic preferences are isomorphic.[5]

The remainder of the paper proceeds as follows. Section 1 sets out a formal model of trade between multiple regions and analyzes a two-country two-region example to pinpoint how trade costs create distributional consequences. Section 2 calibrates the model to regional trade data from the US and calculates region-specific gains from reducing tariffs. It discusses the predictors of these modeled gains from liberalization, and how these gains differ from commonly-used measures of exposure to trade. Section 3 examines whether these modeled gains from trade correlate with support for trade among voters and legislators, first in the aggregate cross-section and then in more robust designs that compare support in the same area across different cases of liberalization. Section 4 concludes with implications for trade policy.

1 THE POLITICAL ECONOMY OF GRAVITY

This section uses the "gravity model" (defined in the introduction) to study how the spatial structure of trade generates uneven gains and losses that provide a basis for political conflict. The gravity model provides a general framework—consistent with various theories of trade—for analyzing trade flows between multiple locations. I analyze a version of the model with one industry and one factor of production. If each region were a country—as in Anderson (1979), Krugman (1980), Eaton and Kortum (2002) and Chaney (2008)—there would be no room for distributional conflict. This section's contribution is in showing how distributional consequences and politics enter from countries being made up of multiple regions. Reducing tariffs affects the cost of all regions of one country trading with all regions of another, which

[5] I use the term "local sociotropism" to refer to both concerns about the effects of trade on the local economy and concerns about the effects of trade on the national economy that are informed by trade's local effects (see Alkon 2017 and Rickard 2022).

creates distributional consequences and conflict through two channels. Regions close to international gates gain more from lower trade costs as they are more dependent on imports and exports. In turn, regions further from international gates, which themselves trade with the regions that gain, lose out from competition with imports in those markets. This section first introduces notation for the general gravity model. It then analyzes a symmetric two-country two-region case to pinpoint this mechanism generating distributional conflict, and integrates a Mayer (1984) political economy to draw out political cleavages.

1.1 *The General Gravity Model*

Here I introduce notation for a general multi-region case and discusses equivalences between different theoretical models of trade.

There are N locations, which I will refer to with subscripts j, o, and d. Labor is the only factor of production. In each location o there are L_o workers who each supply one unit of labor and are paid wage w_o. Trade flows between two regions o and d are given by:

$$X_{od} = \frac{T_o(w_o\tau_{od})^{-\theta}}{\sum_j T_j(w_j\tau_{jd})^{-\theta}} w_d L_d \tag{2}$$

where T_o is an exogenous constant that shifts sales from o to all locations, $\tau_{od} \geq 1$ is the iceberg trade cost between o and d (to deliver 1 unit of goods to location d, producers in o must ship τ_{od} units), and $\theta > 0$ is the trade elasticity. Note that after taking logs on both sides this equation is of the same form as (1).

The price index in location d is

$$P_d = \left(\sum_j T_j(w_j\tau_{jd})^{-\theta} \right)^{\frac{1}{\theta}} \tag{3}$$

so that welfare for a worker in d can be expressed as $u_d := w_d/P_d$. The value of goods that a location sells to other locations equals the value it buys,

$$\sum_d X_{od} = w_o L_o.$$

Substituting Equation (2) into this equation for each location gives N equations that pin down wages in equilibrium:

$$T_o w_o^{-\theta} \sum_d \tau_{od}^{-\theta} P_d^{\theta} w_d L_d = w_o L_o \tag{4}$$

The setup described above is consistent with a number of different models of trade, and the interpretation of the T_o and θ parameters varies across these models. For instance, in an Eaton and Kortum (2002) model, T_o scales productivity across varieties of goods in region o, and θ corresponds to the parameter that governs the distribution of productivity across varieties of goods. In an Armington (Anderson, 1979) or Krugman (1980) model, $\theta + 1$ is equivalent to the elasticity of substitution between varieties.

1.2 *A Two-Country Two-Region Model*

ECONOMICS To fix ideas I consider a stylized case of the model. There are two symmetric countries, home and foreign, each made up of two regions, a border region and a hinterland. I denote variables specific to the border with the subscript b, variables specific to the hinterland with subscript h, and foreign realizations of variables with asterisks. These regions are arranged along a line:

$$-\underbrace{h-b}_{\text{Home}}-\underbrace{b^*-h^*}_{\text{Foreign}}-$$

Regions can trade with each other, but must ship goods via intervening regions. For example, for h to sell to b^*, it must deliver the goods to b and from there b will ship the load to b^*.

The iceberg cost of shipping goods between the border and hinterland regions within both Home and Foreign is $\delta > 1$. The iceberg cost of shipping goods between the two border regions is μt, where $\mu > 1$ represents transportation costs and $t \geq 1$ a tariff.[6]

A good can be shipped to a non-adjacent region but doing so incurs both the costs of shipping between each adjacent region on the route, and an additional multiplicative transshipment cost $\kappa \geq 1$ for each region the good is shipped through. For instance, shipping a good from the home border to the foreign hinterland, one must first ship the good from the home border to the foreign border, costing μt, pay a transshipment cost, κ, at the foreign border and then ship the good from the foreign border to the foreign hinterland, costing δ.

This cost structure generates the following bilateral trade costs:

$$\tau_{bh} = \tau_{hb} = \delta, \quad \tau_{bb^*} = \mu t, \quad \tau_{hb^*} = \tau_{bh^*} = \delta\kappa\mu t, \quad \tau_{hh^*} = \delta^2\kappa^2\mu t$$

Symmetry implies that prices and wages in the home region of a given type are the same as in the foreign region of the same type, and that sales between the two border regions must

[6] Tariffs simply act as an impediment to trade, not a source of revenue. This choice reflects the facts that tariffs as a share of government revenue are miniscule in developed economies and that many government-imposed impediments to trade take the form of quotas and other non-tariff barriers. Having tariff revenues being redistributed from the border to hinterland would further push the hinterland towards supporting protectionism.

be equal, $X_{bb^*} = X_{b^*b}$. The equilibrium condition that the border location's sales equals its purchases is

$$X_{bb} + X_{bh} + X_{bb^*} + X_{bh^*} = X_{bb} + X_{hb} + X_{b^*b} + X_{h^*b}.$$

Writing out this trade balance condition gives:

$$T_b (w_b\delta)^{-\theta} \left(1 + (\mu t\kappa)^{-\theta}\right) P_h^\theta w_h L_h = T_h (w_h\delta)^{-\theta} \left(1 + (\mu t\kappa)^{-\theta}\right) P_b^\theta w_b L_b$$

and cancelling terms gives

$$\left(\frac{P_h}{P_b}\right)^\theta = \left(\frac{w_b}{w_h}\right)^{1+\theta} \frac{T_h L_b}{T_b L_h} \tag{5}$$

This equation implies that in equilibrium, a shock that lowers relative prices in the border region also raises relative wages in the border region. The intuition is that lower prices in the border means that the border market is more competitive. For trade to remain balanced, wages must decrease in the hinterland, making the hinterland's goods more competitive in the border region. Reductions to international trade costs for one region affect wages in other regions through internal terms of trade effects.

Define the real wage in region j at tariff t as $u_j(t) := w_j(t)/P_j(t)$. Define *interregional inequality* as the ratio of real wages in the border region relative to the hinterland, i.e. $u_b(t)/u_h(t)$.

Proposition 1. *Interregional inequality $u_b(t)/u_h(t)$ is strictly decreasing in the tariff t.*

The proof of this result (and all proofs) appears in AppendixA.1. Decreasing the tariff affects interregional inequality through two channels. Lower tariffs directly affect prices in both regions, causing a larger decrease in prices in the border. This change in prices indirectly affects wages through internal trade, as implied by (5).

POLITICS I now model public support for reducing the tariff from some fixed status quo value t to an alternative $t' < t$. I assume that for the tariff depends on both material and non-material considerations. A voter i supports lowering the tariff to t' if $u_j(t') > u_j(t)\varepsilon_i$, where ε_i is a multiplicative shock that captures non-material considerations. I assume ε_i is drawn iid across voters from a distribution with CDF F with support $\mathbb{R}_+$. The share of voters in region j who support lowering the tariff is then

$$s_j(t, t') := F(u_j(t')/u_j(t))$$

Proposition 2. *We have the following:*

(i) $s_b(t, t') > s_h(t, t')$ for all t, t' such that $t > t' \geq 1$.

(ii) If $k^{-\theta} = 0$ and $\varepsilon_i = 1$ for all i, $s_b(t, t') > \frac{1}{2} > s_h(t, t')$ for all t, t' where $t > t' \geq 1$

Part (i) of the proposition says that a larger share of voters in the border region—the region with lower costs of trading with the foreign country—will support liberalization. The logic follows directly from Proposition 1: because reducing trade barriers benefits the border region relative to the hinterland region, voters in the border will be more supportive of reducing trade barriers.

Part (ii) of the proposition considers a case in which a location can only trade with adjacent locations, and in which whether a voter supports decreasing the tariff depends only on whether doing so increases or decreases the real wage in her region. Voters in the border region will support decreasing the tariff as doing so raises their real wage by lowering the price of imports and by increasing their wage through internal terms of trade effects. Voters in the hinterland will oppose lowering the tariff because doing so reduces their real wage. For large enough κ, losses from internal terms of trade effects dominate gains from cheaper imports in the hinterland.

The key takeaway from the proposition is that the combination of non-material considerations (ε_i) and unequal gains across regions is sufficient to create spatial cleavages over trade policy, and even in a world of purely material considerations, there are configurations of trade costs that will make voters in some regions oppose trade because internal trade affects dominate lower prices.

To summarize, I have illustrated how variation in trade costs generates uneven gains from trade, the potential for losses from trade for some regions, and regional divides in support for trade policy. The next section discusses how to quantify these regional gains and losses.

2 TAKING THE MODEL TO THE DATA

The qualitative insight of the model can be interpreted in two ways. First, locations that stand to gain more from a given reduction in international trade costs should be more supportive of liberalization. Second, locations with lower internal costs of accessing world markets should be more supportive of liberalization. In this section I use the gravity model to develop measures of these two concepts. The first measure quantifies the welfare gains to different parts of the US from reductions in international trade costs with different world regions. I employ the exact-hat algebra of Dekle, Eaton and Kortum (2007) to solve for the counterfactual effects of changes in international trade costs as functions of observed trade flows and changes themselves. Doing so gives a measure of exposure to trade that is distinct from commonly-used measures of trade exposure. The second measure backs out internal trade costs with different world markets from internal US trade data.

2.1 *Measuring the Gain from Liberalization*

Suppose one observes an equilibrium realization of the model, and considers a change of trade costs from τ_{od} to τ'_{od}, holding fixed the other exogenous variables, T_o and L_o.

From (4), wages in this counterfactual equilibrium would solve

$$w'_o L_o = T_o \left(w'_o\right)^{-\theta} \sum_d \left(\tau'_{od}\right)^{-\theta} \left(P'_d\right)^{\theta} w'_d L_d,$$

where x' indicates the realization of variable x under this counterfactual. Writing relative changes as $\hat{x} := \frac{x'}{x}$, one can rewrite each of these counterfactual realizations in terms of a relative change from an observed level, $x' = x\hat{x}$:

$$w_o L_o \hat{w}_o = T_o w_o^{-\theta} \sum_d \tau_{od}^{-\theta} P_d^{\theta} w_d L_d \hat{w}_o^{-\theta} \hat{\tau}_{od}^{-\theta} \hat{P}_d^{\theta} \hat{w}_d.$$

Dividing both sides by $w_o L_o = \sum_o X_{od}$, substituting in the identity for exports from (2), and rearranging gives

$$\hat{w}_o = \left(\frac{\sum_d X_{od} \hat{\tau}_{od}^{-\theta} \hat{P}_d^{\theta} \hat{w}_d}{\sum_d X_{od}} \right)^{\frac{1}{1+\theta}}. \tag{6}$$

Counterfactual wages can be expressed as solutions to a system of equations in terms of observed trade flows, counterfactual changes in trade costs, and counterfactual wages and prices. Similarly, one can write

$$\hat{P}_d^{-\theta} = \frac{\sum_o X_{od} \hat{w}_o^{-\theta} \hat{\tau}_{od}^{-\theta}}{\sum_o X_{od}} \tag{7}$$

These two expressions have substantive interpretations. The increase to nominal wages in an origin location is a weighted average of increases in prices and wages in destination locations, and decreases in trade costs with those destinations, weighted by the share of sales from that location accounted for by that destination. The decrease to prices in a given destination is a weighted average of decreases in wages in origin locations and of trade costs with those origins, weighted by the share of purchases by the destination accounted for by each origin.

Equations (6) and (7) give $2N$ equations with $2N$ unknowns, and so given observed trade flows, one can solve for counterfactual changes to wages and prices up to a normalization, and thus can solve for changes to real wages. Note that solving (6) and (7) does not require data on trade costs, prices, productivity, wages, fixed costs, or labor supply. In effect, the method uses observed trade flows to infer the structure of trade costs. One does however need an estimate of θ. Fortunately, a large literature estimates this "trade elasticity". I use the consensus estimate from Simonovska and Waugh (2014) of $\theta = 4$.

2.2 *Data and Estimates*

My main source of data is the Freight Analysis Framework. This is a dataset created by the Bureau of Transportation Statistics and Federal Highway Administration that estimates freight flows between 132 zones within the US and 8 world regions. The US zones correspond to major metro areas and the remainders of states. The Freight Analysis Framework supplements the Commodity Flow Survey—a large survey of manufacturing, mining, and wholesaler shipments administered by the Census Bureau—with data on sectors like agriculture that the Commodity Flow Survey does not cover, and international trade.

Using the most recent iteration of the Freight Analysis Framework, for 2017, I aggregate freight flows between and within zones and regions, and calculate the welfare effects of reductions to trade costs with different world regions.

The main set of outcomes are the welfare effects of trade cost reductions with each world region separately. For each world region, I solve for the effects of a 10% reduction in trade costs with that region. I set $\hat{\tau}_{od} = 0.9$ for pairs linking zones of the US with that region, keep $\hat{\tau}_{od} = 1$ for all other pairs, and solve Equations (6) and (7) for the equilibrium changes in wages and prices, which I use to calculate changes in welfare. Finally, I convert this predicted change in welfare to the elasticity of welfare with respect to trade cost reductions.[7] I do this because it gives me a unitless measure that is more positive for zones that gain more from reductions to trade costs. I refer to this variable as *Gains from liberalization*.[8]

Figure 3 shows the spatial distribution of the resulting gains from liberalization with Canada, Eastern Asia, Europe, Mexico, the Americas net of Canada and Mexico, and Southeast Asia and Oceania. Zones that experience decreases in welfare from reductions in trade costs are outlined. Reductions in trade costs generate aggregate welfare gains, but in a number of region-specific cases of trade cost reductions, zones of the US experience welfare losses. There are two patterns to note. First, there is a clear gravity structure to the distribution of gains. Locations along the Canadian border gain most from reducing trade barriers with Canada, those on the Pacific coast gain the most from liberalization with Asia, and those on the Gulf of Mexico gain the most from liberalization with the Rest of Americas. Second, the losing zones are generally close to zones that experience large gains, but further

[7] Given $\hat{u}$ I calculate $-\frac{\ln \hat{u}}{\ln(0.9)}$. The particular choice of a 10% reduction is not important for the calculated measures. Figure A-1 shows the extremely strong correlation between the gains from liberalization calculated using a 10% reduction to trade costs, and the gains calculated using 50% increases or decreases.

[8] For supplemental analyses I calculate the gains from liberalization with all world regions. I refer to this variable as *Gains from global liberalization.* Gains in the aggregate allow me to study attitudes to trade in the aggregate.

from the border. For instance, the remainder of Oklahoma zone loses from reductions to trade costs with Mexico, while Texas and Dallas in particular experience large gains. This spatial pattern matches the intuition in section 1. Consumers in Dallas benefit from imports from Mexico, but producers in Oklahoma selling to Dallas lose out.

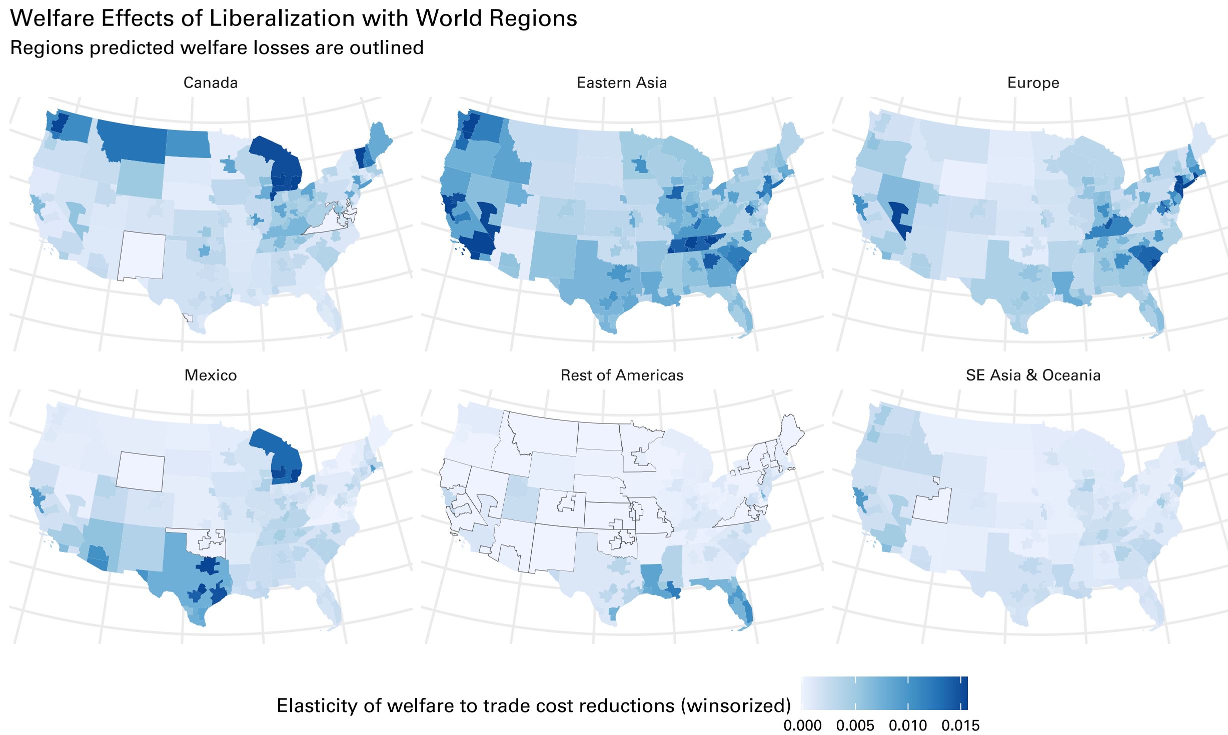

Figure 3: Counterfactual effects of reductions to trade costs with specific world regions

What variation is driving these estimates of the gains from liberalization? Equation (6) suggests that the partial equilibrium effects of reductions in trade costs with a particular region—holding fixed changes to wages and prices in other regions and zones—should be proportional to the ratio of exports to the region in question to sales to all regions and zones, including sales to the home district. Equation (7) suggests that the partial equilibrium effect on prices of a reduction in trade costs with a given region should be proportional to the share of imports from that region in total purchases. Zones that already trade more should gain more from further reductions in trade costs.

These partial equilibrium predictions explain the overwhelming majority of the variation in estimated gains from liberalization. Table A-1 shows regressions of the welfare effects of trade cost reductions against exports divided by total sales and imports divided by total purchases, for all world regions and for specific regions. These variables are strongly positively correlated, with R^2s of 0.97 when including both exports and imports.

It is not obvious without a model of trade that reducing trade costs has larger benefits for places that already engage in trade. Reducing international trade costs by a given percentage implies larger absolute reductions to trade costs for places with higher costs of accessing world markets.

2.3 *Differences With Shift-Share Measures of Trade Exposure*

This measure of gains from liberalization is conceptually and empirically distinct from commonly-used measures of regional exposure to trade. A vast literature following Topalova (2010) and Autor, Dorn and Hanson (2013) measures regional exposure to shocks in the global economy using variants of the following shift-share specification

$$Exposure_{rt} = \sum_i \frac{L_{ir}}{L_r} \cdot shock_{it}$$

where $\frac{L_{ir}}{L_r}$ is the share of employment in industry i in region r in a base year, $shock_{it}$ is a national-level shock to industry i at time t—imports or exports in papers following Autor, Dorn and Hanson (2013), tariff reductions in papers following Topalova (2010)—and the summation is over industries.

In these measures, variation across regions is attributable to differences in the mix of industries and thus differing labor demand shocks, in contrast to the present paper's focus on trade costs which affect consumption and inputs to production as well as labor demand. Autor, Dorn and Hanson (2013) and Kovak (2013) motivate their measures with multi-region models in which locations differ in sector-specific productivity or immobile capital, respectively. These models abstract from internal trade costs. Chinese productivity growth or tariff reductions bring welfare gains from cheaper imported products everywhere. The losses from reduced sales to the domestic market are felt most in regions producing goods competing with Chinese imports or experiencing tariff reductions. Subsequent papers that explore the general equilibrium effects of the China trade shock (Caliendo, Dvorkin and Parro, 2019; Galle, Rodríguez-Clare and Yi, 2023) similarly ignore spatial variation in trade costs.[9]

[9] Caliendo, Dvorkin and Parro (2019) develop a multi-region multi-sector dynamic model with input-output linkages. Their model allows shocks to propagate through the economy via spatial migration and trade linkages. Their empirical exercises do not however take into account how internal trade costs affect importing and exporting activity: they calculate imports and exports for US states by allocating country-industry level imports and exports to states based in the share of each industry in each state. Galle, Rodríguez-Clare and Yi (2023) also develop a multi-sector model, in which workers belong to different groups that correspond to the labor markets studied by Autor, Dorn and Hanson (2013). These labor markets experience differing

Relative to shift-share measures of regional exposure, this paper's measure of the gains from liberalization differs on two margins. First, the measure is driven by variation in trade costs across regions, not by variation in industry mix. Second, it takes into account the uneven benefits to consumption and intermediate input from imports and to labor demand from exports, in addition to how imports affect labor demand. Because it measures a distinct concept, it is not predictably correlated with shift-share measures of exposure. Tables A-2 and A-3 shows that areas with more employment in positive net export industries tend to have smaller estimated gains from liberalization, and that both import penetration and export dependence are positively correlated with gains from liberalization. These correlations suggest that estimates based on inter-regional trade flows capture very different variation to those based on allocating industry-level trade flows to regions.

2.4 *Measures of Internal Trade Costs*

This subsection introduces two alternative measures of trade access that I will use in the empirical analysis. The gains from liberalization variables infer trade costs from actual trade flows. They take into account all factors that influence a location's costs of engaging in international trade. Figure 3 shows that geography is a large contributor to these costs, but is not the only contributor. To supplement the primary measure, I calculate variables that more transparently measure the extent of frictions to international trade with specific partners from geographic and non-geographic internal trade barriers. This transparency comes at the costs of imposing more structure on internal trade costs relative to the gains from liberalization measures, and of not corresponding as directly to a theoretical quantity—the potential increase in welfare—that should influence support for liberalization.

Head and Ries (2001) provide a way to back the inverse of trade costs out of observed flows. With the additional assumptions that locations can trade with themselves at no shipment cost, that is, $\tau_{oo} = 1$ for all o, and that trade costs are symmetric, that is, $\tau_{od} = \tau_{do}$ for all o, d, inverse of trade costs can be written in terms of observed trade flows:

$$\tau_{od}^{-\theta} = \left(\frac{X_{od} X_{do}}{X_{oo} X_{dd}} \right)^{\frac{1}{2}}. \tag{8}$$

Here X_{od} are shipments from o to d. I calculate symmetric internal trade costs according to Equation (8) using internal trade flows—domestic products shipped to other parts of the US—from the Freight Analysis Framework data.

To measure the importance of these internal trade costs for international trade, I calculate

demand shocks as in Autor, Dorn and Hanson (2013), but the welfare effects of price changes are felt equally everywhere.

internal trade access: the average of these costs from each location to locations of the US where imports and exports to different world regions enter and leave. To directly measure the importance of geography for trade access, I predict inverse trade costs using geographic distance, and refer to the resulting average as *internal distance trade access*. Appendix C.1 provides further detail on the construction of these variables.

3 Linking the Gains from Liberalization to Support for Trade

The remainder of the paper examines whether the modeled gains from liberalization correspond to support for liberalization among voters and legislators.

My preferred specification is a linear probability model of the form

$$\textit{support for trade}_{ij} = \alpha_{z(i)} + \beta\, \textit{gains from liberalization}_{z(i)j} + X_{z(i)j}\gamma + \delta_{b(i)j} + \varepsilon_{ij}$$

where the dependent variable is coded as 1 if individual i supports trade on issue j, $\alpha_{z(i)}$ is a fixed effect for $z(i)$, the FAF zone containing i, $\textit{gains from liberalization}_{z(i)j}$ is the modeled welfare gain in i's zone from reducing trade barriers with j, $X_{z(i)j}$ are zone-by-issue controls, $\delta_{b(i)j}$ is a j-specific fixed effect for a set of attributes $b(i)$ specific to i, and ε_{ij} an error term. Note that this specification has a two-way fixed effects structure, holding fixed features of the zone through $\alpha_{z(i)}$ and the issue in question through $\delta_{b(i)j}$. In additional specifications, I use the $\textit{internal trade access}_{z(i)j}$ and $\textit{internal distance trade access}_{z(i)j}$ measures proposed above as alternative independent variables.

3.1 *Other Data*

Measures of support for trade I examine the relationship between gains from liberalization and support for specific cases of trade liberalization among voters and legislators. The primary source of data concerns support for trade with different partners from multiple waves of the Cooperative Election Survey. Over a series of waves since 2006, the Cooperative Election Survey has asked large samples of American voters about the Central America Free Trade Agreement (CAFTA), extending NAFTA to include Peru and Colombia, the Korea-US Free Trade Agreement (KORUS), and placing tariffs on Chinese goods. Table A-11 presents the full question wordings, years, and sample sizes; the total sample size is around 330,000. I focus on these questions because they are specific to clearly identifiable world regions, and do not specify particular industries to be protected or liberalized.[10] I allocate Cooperative

[10] Other trade-policy relevant questions in the Cooperative Election Survey ask about the Trans Pacific Partnership, and about tariffs on steel and aluminum. The regional impact of the Trans Pacific Partnership in the US is ambiguous as the agreement would have included Mexico, Canada and countries in South America

Election Survey respondents to FAF zones using county identifiers.

Studying support for specific trade issues, rather than attitudes towards trade in general, has two advantages. First, issues like CAFTA and the 2018 trade war with China were topics of public debate, and so it is more likely that voters were informed and formed opinions about such issues, relative to trade in the abstract (Kuo and Naoi, 2015). Second, a very different set of regions would gain from lowering tariffs with Central America relative to Eastern Asia. Within-zone variation in the gains from liberalization with different partners allows me to hold fixed characteristics of locations by using zone fixed effects.

The second source of data concerns voting in the House of Representatives on Free Trade Agreements. I use the Congressional Research Service's 2023 classification of the final votes on Free Trade Agreements, and data on congressional voting from Lewis et al. (2021). I spatially intersect district boundaries from Lewis et al. (2013) with FAF zones and allocate members of congress to zones. Studying behavior in congress helps address the concern that trade policy preferences among voters may not translate into policy (Guisinger, 2017).

CONTROLS My control variables are individual characteristics predictive of trade preferences, and alternative measures of trade exposure. The Cooperative Election Survey provides information on individual education, race, and gender, variables shown to correlate with trade preferences (Scheve and Slaughter, 2001; Hainmueller and Hiscox, 2006; Mansfield and Mutz, 2009; Guisinger, 2017; Mutz, Mansfield and Kim, 2021). I supplement this data with information on whether individuals live in rural or urban locations, using the US Department of Agriculture's zipcode-level Rural-Urban Commuting Area codes. These codes allocate each zipcode to a 9-point scale based on density, urbanization, and commuting patterns.

I use the Freight Analysis Framework to measure in which zone imports and exports enter and leave the US. I calculate the value of exports leaving the US via a zone divided by all sales from that zone, and the value of imports entering the US via a zone divided by purchases by that zone. These controls address the concern that the modeled gains from liberalization are picking up jobs being created directly by shipping traded goods via the zone, a distinct theoretical concept to the one under study. I also calculate net import penetration, by allocating industry-level trade exposure from the Census Bureau to zones based on employment in the County Business Patterns (described in more detail in Appendix C.2). This control addresses the concern that factors related to industrial composition, not geography, influence support for trade.

as well as countries in East Asia and Oceania, but the main parties with which the US did not already have a Free Trade Agreement were Japan and Vietnam.

3.2 *Gains From Liberalization and Popular Support for Trade*

Before estimating the relationship between gains from liberalization and support for trade among voters, I plot the raw data to illustrate the identifying variation. Figure 4 illustrates how both the gains from liberalization with different world regions, and support for such liberalization, varies within zones of the US. The x axis plots the gains from liberalization at the zone level with Eastern Asia (shaded in red) and the Rest of Americas (outlined in blue). The y axis plots average support for free trade across four different issues. The left two panels show issues specific to trade with Eastern Asia—tariffs on Chinese goods and the US-South Korea free trade agreement (KORUS)—the right two panels show issues specific to trade with the Americas: the CAFTA-DR trade agreement with Central America and the proposed extension of NAFTA to Peru and Colombia. The left panels show that zones that are predicted greater gains from liberalization with East Asia are more supportive of trade with that region, but zones that are predicted greater gains from lower trade barriers with the Rest of Americas are not. The right panels show the opposite pattern: areas that gain from trade with the Americas are more supportive of trade with the Americas. Areas that gain from liberalization with Asia are more supportive of trade with the Americas—suggesting voters in those areas may simply be more supportive of trade in the aggregate—but this association is weaker than both that with support for trade with East Asian countries, and the relationship between the gains from liberalization with the Rest of Americas and support for trade with Central America and Peru and Colombia.

Table 1 estimates the relationship between gains from liberalization and support for trade on these issues. Model (1) presents the cross-sectional relationship, adjusting only for education-race-gender combinations. It indicates that voters in zones that gain more from liberalization are more supportive of trade. Model (2) adds zone fixed effects, suggesting that the positive relationship between region-specific gains from liberalization and support for trade is not driven by people in certain regions generically supporting all trade. A 0.01 unit increase in the region-specific gains from liberalization corresponds to a 3.2 percentage point increase in support for free trade with that region. To put this estimate in perspective, college graduates in this dataset are around 10 percentage points more supportive of free trade than non-graduates, while men are around 3 percentage points more supportive of free trade than women. A two standard deviation increase in gains from liberalization corresponds to 44% of the college-non college gap, and 151% of the gender gap.[11] Model (3) adds controls for imports and exports entering the US in the particular zone, industry net import penetration with

[11] I focus on a two standard deviation change as going from 0 to 1 on college or female status corresponds to around a two standard deviation change in those variables. Figure A-5 plots standardized coefficients relating support for free trade to gains from liberalization and various demographics.

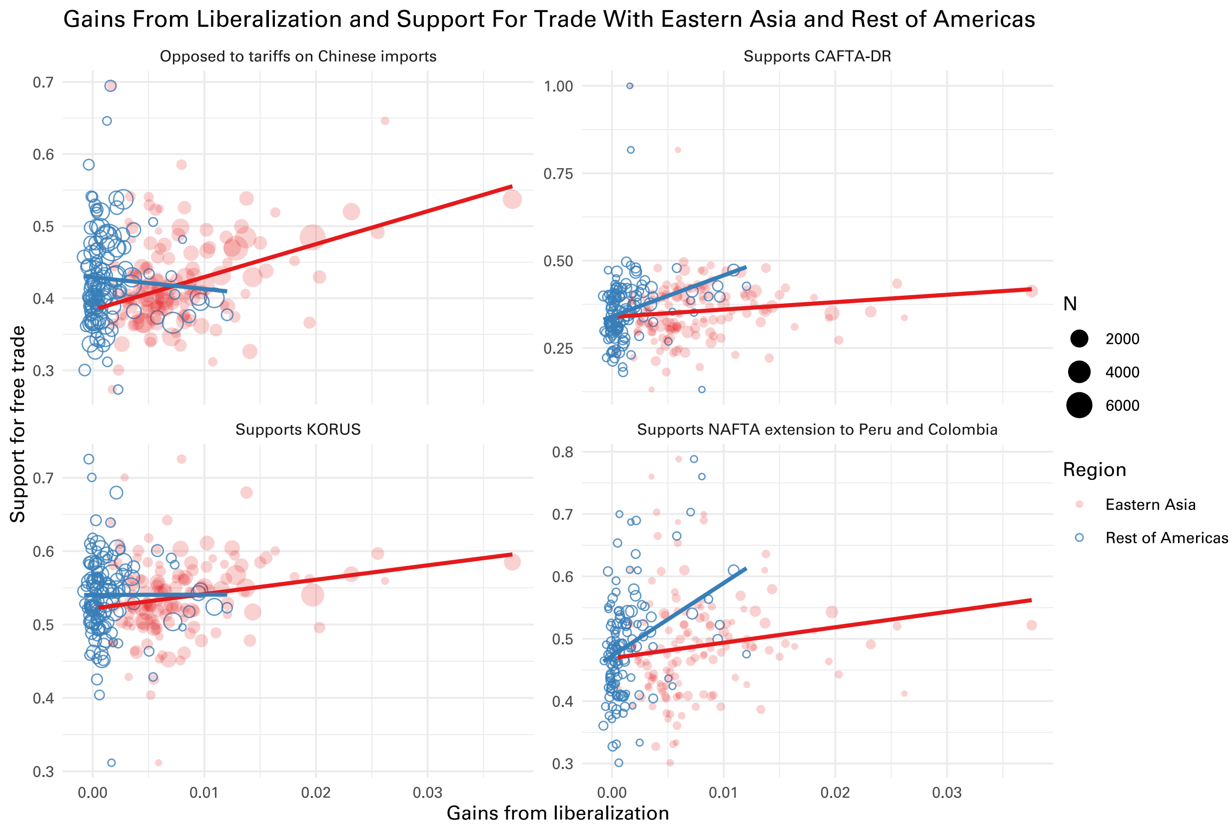

Figure 4: Gains from liberalization with different world regions and support for region-specific trade issues

The y axis is the share of respondents in the FAF zone expressing support for trade on a particular question, the x axis is the modeled welfare gains to the FAF zone from reducing trade costs with the Rest of Americas or Eastern Asia. In each figure, each zone has two x values and one y value.

the trading partner in question, and for rural-urban codes interacted with survey question indicators.

Models (4) and (5) use measures of internal inverse trade costs with the zones through which imports and exports pass, and indicate that places with better access to such trade hubs are more supportive of trade. Estimates using these internal cost-related are larger than those for the gains from liberalization. The coefficient in model (5) indicates that a two standard deviation increase in log internal distance trade access corresponds to 98% of the college-non college gap in support for trade. One possible explanation for this discrepancy in magnitudes is that the gains from liberalization coefficient is biased down by measurement error from difficulties in allocating international trade flows to regions of the US. The Freight Analysis Framework uses proprietary data from the Census Bureau on the domestic origins and destinations of trade flows and their points of entry and exit, but these origins and destinations do not always coincide with where goods are produced or consumed.[12]

3.2.1 Heterogeneity

These estimates are conspicuously unheterogeneous. Figure 5 plots the coefficient on region-specific gains from trade from regressions analogous to model (2), subset to individuals with specific characteristics. There are not clear differences across gender, employment, or homeownership. Lack of heterogeneity by employment or home-ownership is consistent with respondents having locally other-regarding or sociotropic preferences, as one might expect home-owners or those in work to have a stronger material stake in their region's fortunes. Effect sizes are somewhat larger for college graduates than non-graduates, but estimates for non-graduates are still large and statistically significant. This lack of heterogeneity by education runs against the logic of a Heckscher-Ohlin model, in which one might expect low skill workers to lose from and oppose trade everywhere, but lose most in areas more exposed to international trade (for an alternative theoretical account with that prediction, see Palmtag, Rommel and Walter 2020). This lack of heterogeneity validates the decision to ignore factor differences in the model in Section 1.

Patterns of heterogeneity, including by education, reflect access to information in part. Union and former union members experience larger effects, a pattern that perhaps reflects unions mobilizing their members for and against trade as it matches their interests Kim and Margalit (2017). The positive effects of gains from trade on support for trade are confined to those who describe themselves as following "what's going on in government and public affairs most of the time."

The estimates in Table 1 are driven by Republicans and Independents. There is no effect subsetting to Democrats. Effect sizes are also smaller for Black respondents, though heterogeneity by race seems attributable to partisanship. Estimates for Black Democrats are close to zero and very close to those for all Democrats, while estimates for Black non-Democrats are close to those for the full sample, though imprecisely estimated.

Estimates are heterogeneous by region, which helps explain the null estimate for Democrats.

[12] One limitation of the Freight Analysis Framework data is that it is specific to 2017, while the Cooperative Election Survey data relates to a range of years. This issue most likely biases the estimated coefficients towards zero by introducing measurement error—gains from liberalization in 2017 are a noisy proxy for gains from liberalization in year t. I address possible concerns that this issue introduces other biases in two ways. First, in Table A-12, I re-estimate Table 1 using FAF data from 2012. Second, I use port-by-year trade data to impute year-specific trade flows, which I use to recalculate the various measures and re-estimate the models in Table 1 in Table A-13. I discuss the imputation in Appendix C.3. Across these robustness checks I obtain similar magnitudes and patterns of significance. Magnitudes with the 2012 data are slightly smaller, which is expected given greater measurement error in the 2012 FAF, which used less granular internal trade data. Magnitudes with the imputed data are slightly larger, which is consistent with classical measurement error biasing the main results towards zero.

	Support for free trade				
	(1)	(2)	(3)	(4)	(5)
Gains from liberalization	2.535*	3.236*	3.036*		
	(0.369)	(0.750)	(1.042)		
log internal trade access				0.049*	
				(0.008)	
log internal distance trade access					0.041*
					(0.008)
Imports via zone / total purchases			−0.073	−0.115*	−0.165*
			(0.049)	(0.057)	(0.073)
Exports via zone / total sales			0.184*	−0.017	−0.021
			(0.061)	(0.059)	(0.061)
Industry net import penetration			1.910*	1.954*	1.953*
			(0.324)	(0.308)	(0.309)
Education x race x gender x question FE	x	x	x	x	x
Zone FE		x	x	x	x
Rural-urban x question FE			x	x	x
N	327303	327303	327218	327218	327218
R^2	0.046	0.049	0.052	0.052	0.052

This table presents evidence of the relationship between gains from liberalization and support for free trade. Data is at the individual level. The dependent variable is coded as 1 if the respondent answer aligns with support for trade: opposition to tariffs on Chinese goods, support for the US joining CAFTA-DR and KORUS, and support for extending NAFTA to Peru and Colombia. Models (1)–(3) examine the correlates of gains from liberalization with Eastern Asia in the case of Chinese tariffs and KORUS, and Rest of America in the case of CAFTA-DR and NAFTA extension, (4) examines the the correlates of average internal trade access, the average internal inverse trade cost with locations where imports from and exports to the world region in question enter the country, weighted by the value of import or exports entering in that location, (5) examines the equivalent where internal trade costs are first predicted using geographic distance. All models include fixed effects for combinations of race, education level, and gender interacted with an indicator for the survey question, (2)–(5) control for FAF zone fixed effects, (3)–(5) control for imports from and exports to the region leaving or entering the US in the FAF zone divided by total purchases and sales, for average manufacturing industry import penetration minus export dependence with the country or group of countries in question, and for fixed effects for the 9-point rural-urban continuum value of the respondent's zip code interacted with an indicator for the survey question. Observations are weighted using CES survey weights. Standard errors clustered by FAF zone in parentheses. $^*p < 0.05$.

Table 1: Relationship between gains from liberalization and support for trade

Estimates are largest subsetting to the South (defined using the Census Bureau's regions), smaller but positive for the West, and negative but imprecisely estimated for the remainder of the country. This heterogeneity in estimates is due to heterogeneity in identifying variation. The gains from trade with Latin America are concentrated in the US South; those from trade with Asia are concentrated—though not to the same extent—in the West (see Figure 3). Excluding these regions removes much of the identifying variation, which explains the much larger confidence interval for the "Other regions" estimate. This heterogeneity explains why the estimates are null for Democrats. Table A-7 examines estimates subset by region and party, controlling for party identification interacted with survey questions. The estimate for the entire US is robust to controlling for party, though the estimate is driven by the South. Within the South, estimates of the effects of gains from liberalization on support for trade are positive for those identifying with each party and none. That Democrats are under-represented in the South explains the null estimate.

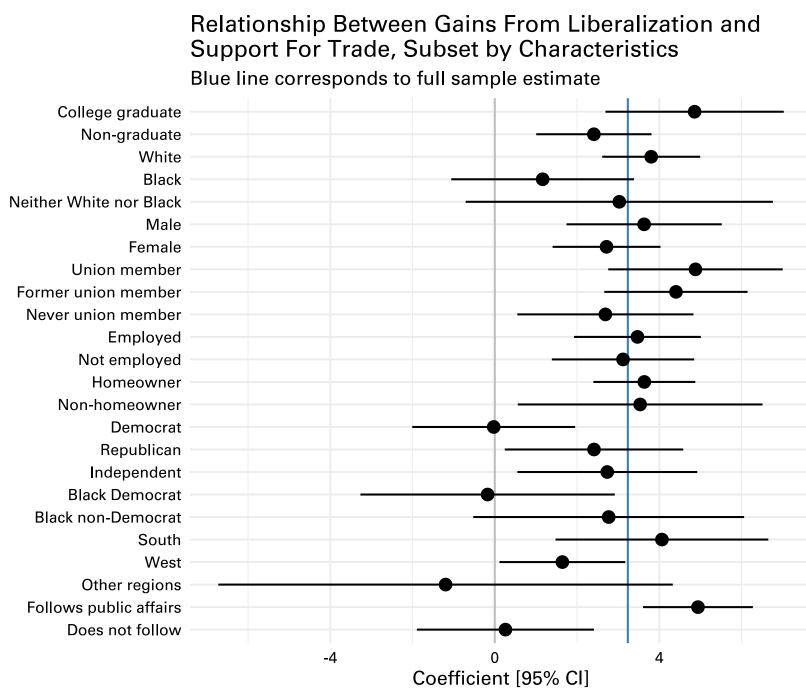

Figure 5: Heterogeneity by respondent attributes in the relationship between gains from trade and support for trade

Each row shows the coefficient on gains from trade with region from a model subset to the particular group specified. All models include zone and education-race-gender-question fixed effects, equivalent to model (2) of Table 1. Confidence intervals are constructed from standard errors clustered by FAF zone.

3.2.2 Threats to Identification

The residual threats to identification are unobserved features of the places that gain from liberalization with a given region that correlate with support for trade with that region in particular. One specific concern is that the partisan valence of the various trade issues varies. CAFTA, KORUS, and trade agreements with Peru and Colombia were introduced by the Bush administration, though the latter three were implemented during the Obama administration. Tariffs on Chinese goods were introduced by the Trump administration. Areas that gain from liberalization with Eastern Asia tend to be on the Pacific Coast and vote Democrat, while areas that gain from liberalization with the Rest of Americas tend to be on the Gulf of Mexico and more Republican. The estimates could be biased by Republicans being less opposed to tariffs on Chinese goods and more supportive of trade with Latin America for reasons of partisanship and not self-interest (though the positions of the parties could also be endogenous to the interests of their supporters). I address this concern in two ways. First, Table A-7 shows that the estimates are robust to the addition of party-by-issue fixed effects, allowing Republicans and Democrats to differ in their support for different trade issues. Second, Table A-6 shows that the results of Table 1 are robust to dropping each specific trade issue, which rules out the concern that attitudes to the Trump administration's trade war with China solely account for the estimates.

The second specific concern is that people in parts of the US that gain more from trade with a particular world region simply hold more favorable attitudes towards that region, that manifest in greater support for trade with that region. Such attitudes could be upstream or downstream from trade. Immigrant networks help to facilitate trade (Herander and Saavedra, 2005), but the gains from trade could foster greater tolerance towards the trading partner. Fortunately, the Gallup Poll Social Series includes questions on how favorably respondents feel towards different countries. Table A-8 shows that respondents in areas that gain more from liberalization with Eastern Asia do hold more favorable views of East Asian countries, but that respondents in areas that gain more from liberalization with the Rest of Americas hold less favorable views of countries in that region. Examining the relationship between gains from liberalization and favorable views in a specification with zone fixed effects similar to that in Table 1, I find no relationship between the two variables, which rules out the concern that such an association drives the results in Table 1.

3.2.3 Evidence for the Plausibility of the Mechanism

The evidence thus far suggests that voters tend to be more supportive of trade policies that benefit them more. The claim is not that voters necessarily understand the gravity model, but are able to express preferences consistent with it through cognitively simpler channels. Scholarship on "low information rationality" examines how voters approximate sophisticated reasoning by taking cues from politicians, the media, and unions, which they combine with information from their own lives and social networks (Popkin, 1991; Lupia, 1994; Ansolabehere, Meredith and Snowberg, 2014). Patterns of heterogeneity in Figure 5, for instance by union membership, are consistent with elite influence. The gravity model, relative to other trade models studied in the trade preferences literature, requires less sophisticated reasoning and information gathering on the part of voters. To form preferences consistent with the gravity model, voters need some awareness of the relative importance of trade with different world regions for their locality, and need to reason that if trade with a world region benefits the locality, then more trade with that region will benefit it more. Voters need not be aware of the role of geography and trade costs in generating these observed trade flows, nor of patterns of trade outside their area. In contrast, to form preferences consistent with the Heckscher-Ohlin model, in the absence of cues voters need an awareness of their country's factor intensities relative to the rest of the world, and an understanding that trade equalizes factor prices. It may be easier for voters to form preferences consistent with a trade model when the model fits observed patterns of trade.[13]

Voters' perceptions of the importance of trade with different parts of the world for their locality and the United States as a whole correlate with the measured gains from liberalization. The Chicago Council on Global Affairs' 2018 survey contains two sets of questions on the economic importance of trade with different partners. The first asks respondents "If the United States gets into a trade war with China, how concerned are you that this would hurt the local economy in your area?" and the equivalent question but about a trade war with Mexico. This question is close to the concept measured by the gains from liberalization: if the gains to an area from decreasing trade costs are large, then so are the losses from increasing trade costs by raising tariffs. The second set of questions asks respondents how important relationships with various countries are for the US economy. These questions are conceptually further from the gains from liberalization, in that they refer to the US economy as a whole, rather than the respondent's region. A positive relationship between the gains from liberalization and perceptions of economic importance might reflect voters sociotropically basing their perceptions of the effects of trade on the country at large on their

[13]For instance, the Heckscher-Ohlin model does rationalize political cleavages in the Americas and Europe in the 19th century (Rogowski, 1989). Voters then could not have been fully aware of that model, which would not be developed until the 1910s. Heckscher and Ohlin were however trying to rationalize patterns of trade in the 19th century Atlantic economy (O'Rourke and Williamson, 1994), and so their intuitions would have made sense to 19th century voters. In contrast, the Heckscher-Ohlin model does not fit trade cleavages in the late 20th century (Hiscox, 2002), when, due to the rise of intra-industry trade, it also does a poor job rationalizing trade flows (Krugman, 2009).

perceptions of its effects on their region.

Tables A-9 and A-10 document a positive relationship between the gains from liberalization and internal trade access measures, and these measures of the economic importance of different partners. These estimates make it more plausible that the other results reflect beliefs about the potential gains from trade. They do however come with the caveat that the sample size is smaller than in the other surveys used—around 1,000 for the trade war questions and 2,000 for the importance questions—and so the estimates are less precise and may by chance be unrepresentative. It is not the case that perceptions of the economic importance of different countries simply reflect the salience of different countries in different parts of the US. The Chicago Council survey also asks about the importance of the same countries for US security. Table A-10 shows that such perceptions, which should be unrelated to economic benefits, are uncorrelated with the gains from liberalization and internal trade access.

3.2.4 Additional Cross-Sectional Evidence

In addition to the within-zone relationship between gains from liberalization with different world regions and support for trade with those regions, there is a positive relationship between gains from liberalization in the aggregate and support for trade in the aggregate. Table A-4 presents this cross-sectional relationship, using data from the Gallup Poll Social Series, which asks respondents whether they "see foreign trade more as an opportunity for economic growth through increased U.S. exports or a threat to the economy from foreign imports?" Unlike in the within-zone specifications, to interpret these estimates causally one must make the stronger assumption that unobservable features of a place that make individuals more supportive of trade are uncorrelated with gains from liberalization. The positive association is however robust to the addition of the controls from Table 1, and state fixed effects. The estimates thus identify off within-state variation and not cross-region differences.

One concern about the evidence thus far is that survey responses concerning trade could be weakly-held and not predict real-world political behavior. Table A-5 addresses this concern by examining presidential voting. There are three elections in recent history when trade policy has been salient and American voters have been presented with candidates offering distinct positions on trade policy. Ross Perot ran for president in 1992 and 1996 on third-party platforms critical of NAFTA and the WTO. In 2016, Donald Trump's campaign called for renegotiating NAFTA and withdrawing from the Trans Pacific Partnership. I examine the relationship between the aggregate gains from liberalization and support for these three candidacies, conditioning on Republican voteshare in 1988 in the case of Perot and 2012 in the case of Trump. Voters in locations that gain more from liberalization were less likely to vote for anti-trade candidates, an association that is robust to controlling for urbanization and the presence of Black voters, college graduates, and manufacturing employment. Counties that gain more from liberalization were less likely to vote Republican in 2016, conditioning on 2012 voteshare, but no less likely to vote Republican in 2008 or 2004 (Figure A-4), suggesting that the 2016 association is not due to those counties following differential trends.

3.3 *Voting in Congress*

Representatives of congressional districts that stand to gain more from trade with a given region are also more supportive of trade with that region. Table 2 presents the results of regressions of voting for a given Free Trade Agreement against the gains to the legislator's district from liberalization with that world region, and the internal trade access measures. These specifications use FAF zone-by-member fixed effects and so compare the same legislator representing the same district voting on trade agreements with different impacts for the district. These specifications thus adjust for the propensity of some districts to elect legislators who are more supportive of trade in the aggregate. All three independent variables are positively associated with voting for a given Free Trade Agreement. A 0.01 unit increase in gains from liberalization corresponds to a 4 percentage point increase in the probability of a member of congress voting for the relevant trade agreement. These estimates provide further evidence against the concern that voters' trade policy preferences are irrelevant for policy, and help establish the plausibility in this case of the idea that voters take cues from political elites.

4 DISCUSSION

Trade flows, both within and between countries, are influenced by distance-related trade costs as much as by traditional sources of comparative advantage. This paper has analyzed how inter-regional trade and variation in trade costs create divergent effects of liberalization across the regions of a given country, and coalitions of regions that win and lose from liberalization. In doing so it introduces measures of the gains from liberalization and shows they map onto support for trade, by both voters and legislators. This section discusses the implications of these findings for trade policy.

In the late 19th and early 20th centuries, trade policy mapped onto broad electoral divides in the US, and US tariff policy and engagement with the world fluctuated wildly between administrations. Trade policy diminished as an electoral issue in the New Deal era, but has recently returned, with important implications for the credibility of US commitments abroad. Hiscox (2002) argues that whether trade is a feature of mass electoral politics depends on whether the distributional consequences of trade map onto broad social divisions. While Hiscox focuses on class divides, such divisions do not have to be along class lines to make

	Voting for Free Trade Agreement		
	(1)	(2)	(3)
Gains from liberalization	3.961^{*}		
	(1.628)		
log internal trade access		0.036^{*}	
		(0.009)	
log internal distance trade access			0.027^{*}
			(0.008)
Bill FE	x	x	x
Zone-Member FE	x	x	x
N	17804	17804	17804
R^2	0.696	0.697	0.696

This table presents evidence of the relationship between gains from liberalization, internal trade costs, and voting in the House for Free Trade Agreements. Data is at the member-bill-FAF zone level. The dependent variable is coded as 1 if the member voted for the Free Trade Agreement, 0 if against. The independent variable in (1) is the elasticity of welfare in the FAF zone to reduced trade costs with that world region, in (2) log average internal inverse trade costs with that region, in (3) log average distance-based internal inverse trade costs. All models include bill fixed effects and member-by-FAF zone fixed effects. In cases where a congressional district falls into more than one FAF zone, observations are weighted by the share of the district in the FAF zone. Standard errors clustered by FAF zone in parentheses. $^{*}p < 0.05$.

Table 2: Relationship between gains from liberalization and voting on Free Trade Agreements

trade policy central to political conflict. Trubowitz (1998) analyzes how the structure of the US economy in the late 19th century created regional coalitions over trade policy and foreign policy more broadly, between the agricultural and exporting South and West, and the manufacturing and import-competing Northeast (see also Bensel 2000). In that period, American trade fit squarely within the Heckscher-Ohlin framework: the country was land abundant and capital scarce, and it was simply the concentration of manufacturing in one region that created the inter-regional divide. The rise of intra-industry trade means that American trade is less easily rationalized by a Heckscher-Ohlin model. This paper highlights how regional divides are inherent to trade policy even in the absence of industrial clustering or Stolper-Samuelson forces.

REFERENCES

Alkon, Meir. 2017. "Local Sociotropism: How Community Variation in Trade Exposure Affects Voter Demands.".
URL: *https://papers.ssrn.com/abstract=3103852*

Alt, James E. and Michael Gilligan. 1994. "The Political Economy of Trading States: Factor Specificity, Collective Action Problems and Domestic Political Institutions." *Journal of Political Philosophy* 2(2):165–192.

Anderson, James E. 1979. "A Theoretical Foundation for the Gravity Equation." *The American Economic Review* 69(1):106–116.

Anderson, James E and Eric Van Wincoop. 2003. "Gravity with Gravitas: A Solution to the Border Puzzle." *American Economic Review* 93(1):170–192.

Ansolabehere, Stephen, Marc Meredith and Erik Snowberg. 2014. "Mecro-Economic Voting: Local Information and Micro-Perceptions of the Macro-Economy." *Economics & Politics* 26(3):380–410.

Arkolakis, Costas, Arnaud Costinot and Andrés Rodríguez-Clare. 2012. "New Trade Models, Same Old Gains?" *American Economic Review* 102(1):94–130.

Autor, David, David Dorn, Gordon Hanson and Kaveh Majlesi. 2020. "Importing Political Polarization? The Electoral Consequences of Rising Trade Exposure." *American Economic Review* 110(10):3139–3183.

Autor, David H., David Dorn and Gordon H. Hanson. 2013. "The China Syndrome: Local Labor Market Effects of Import Competition in the United States." *American Economic Review* 103(6):2121–2168.

Baccini, Leonardo and Stephen Weymouth. 2021. "Gone For Good: Deindustrialization, White Voter Backlash, and US Presidential Voting." *American Political Science Review* 115(2):550–567.

Baker, Andy. 2003. "Why is Trade Reform So Popular in Latin America?: A Consumption-Based Theory of Trade Policy Preferences." *World Politics* 55(3):423–455.

Ballard-Rosa, Cameron, Mashail A. Malik, Stephanie J. Rickard and Kenneth Scheve. 2021. "The Economic Origins of Authoritarian Values: Evidence From Local Trade Shocks in the United Kingdom." *Comparative Political Studies* 54(13):2321–2353.

Barjamovic, Gojko, Thomas Chaney, Kerem Coşar and Ali Hortaçsu. 2019. "Trade, Merchants, and the Lost Cities of the Bronze Age." *The Quarterly Journal of Economics* 134(3):1455–1503.

Bensel, Richard Franklin. 2000. *The Political Economy of American Industrialization, 1877–1900*. Cambridge: Cambridge University Press.

Busch, Marc L. and Eric Reinhardt. 1999. "Industrial Location and Protection: The Political and Economic Geography of U.S. Nontariff Barriers." *American Journal of Political Science* 43(4):1028–1050.

Busch, Marc L. and Eric Reinhardt. 2000. "Geography, International Trade, and Political Mobilization in U.S. Industries." *American Journal of Political Science* 44(4):703–719.

Caliendo, Lorenzo and Fernando Parro. 2015. "Estimates of the Trade and Welfare Effects of NAFTA." *The Review of Economic Studies* 82(1):1–44.

Caliendo, Lorenzo, Maximiliano Dvorkin and Fernando Parro. 2019. "Trade and Labor Market Dynamics: General Equilibrium Analysis of the China Trade Shock." *Econometrica* 87(3):741–835.

Chaney, Thomas. 2008. "Distorted Gravity: The Intensive and Extensive Margins of International Trade." *American Economic Review* 98(4):1707–1721.

Congressional Research Service. 2023. Major Votes on Free Trade Agreements and Trade Promotion Authority. CRS Report R45846.

Costinot, Arnaud and Andrés Rodríguez-Clare. 2014. Chapter 4 - Trade Theory with Numbers: Quantifying the Consequences of Globalization. In *Handbook of International Economics*, ed. Gita Gopinath, Elhanan Helpman and Kenneth Rogoff. Vol. 4 of *Handbook of International Economics* Elsevier pp. 197–261.

Dekle, Robert, Jonathan Eaton and Samuel Kortum. 2007. "Unbalanced Trade." *American Economic Review* 97(2):351–355.

Donaldson, Dave. 2018. "Railroads of the Raj: Estimating the Impact of Transportation Infrastructure." *American Economic Review* 108(4-5):899–934. Number: 4-5.

Eaton, Jonathan and Samuel Kortum. 2002. "Technology, Geography, and Trade." *Econometrica* 70(5):1741–1779.

Eckert, Fabian, Teresa C. Fort, Peter K. Schott and Natalie J. Yang. 2020. Imputing Missing Values in the US Census Bureau's County Business Patterns. Working Paper 26632 National Bureau of Economic Research.
URL: *https://www.nber.org/papers/w26632*

Fouquin, Michel and Jules Hugot. 2016. Two Centuries of Bilateral Trade and Gravity Data: 1827–2014. CEPII Working Papers 2016-14.

Galle, Simon, Andrés Rodríguez-Clare and Moises Yi. 2023. "Slicing the Pie: Quantifying the Aggregate and Distributional Effects of Trade." *The Review of Economic Studies* 90(1):331–375.

Guisinger, Alexandra. 2017. *American Opinion on Trade: Preferences Without Politics*. New York: Oxford University Press.

Hainmueller, Jens and Michael J. Hiscox. 2006. "Learning to Love Globalization: Education and Individual Attitudes Toward International Trade." *International Organization* 60(2):469–498.

Head, Keith and John Ries. 2001. "Increasing Returns versus National Product Differentiation as an Explanation for the Pattern of U.S.-Canada Trade." *American Economic Review* 91(4):858–876.

Helms, Benjamin. N.d. "Global Economic Integration and Nativist Politics in Emerging Economies." *American Journal of Political Science*. Forthcoming.

Herander, Mark G. and Luz A. Saavedra. 2005. "Exports and the Structure of Immigrant-Based Networks: The Role of Geographic Proximity." *Review of Economics and Statistics* 87(2):323–335.

Hiscox, Michael J. 2002. *International Trade and Political Conflict: Commerce, Coalitions, and Mobility*. Princeton: Princeton University Press.

Hortaçsu, Ali, F. Asís Martínez-Jerez and Jason Douglas. 2009. "The Geography of Trade in Online Transactions: Evidence from eBay and MercadoLibre." *American Economic Journal: Microeconomics* 1(1):53–74.

Jäkel, Ina C. and Marcel Smolka. 2017. "Trade policy preferences and factor abundance." *Journal of International Economics* 106:1–19.

Kim, In Song. 2017. "Political Cleavages within Industry: Firm-level Lobbying for Trade Liberalization." *American Political Science Review* 111(1):1–20.

Kim, Sung Eun and Yotam Margalit. 2017. "Informed Preferences? The Impact of Unions on Workers' Policy Views." *American Journal of Political Science* 61(3):728–743.

Kovak, Brian K. 2013. "Regional Effects of Trade Reform: What Is the Correct Measure of Liberalization?" *American Economic Review* 103(5):1960–1976.

Krugman, Paul. 1980. "Scale Economies, Product Differentiation, and the Pattern of Trade." *The American Economic Review* 70(5):950–959.

Krugman, Paul. 2009. "The Increasing Returns Revolution in Trade and Geography." *The American Economic Review* 99(3):561–571.

Kuo, Jason and Megumi Naoi. 2015. Individual Attitudes. In *The Oxford Handbook of the Political Economy of International Trade*, ed. Lisa L. Martin. Oxford University Press pp. 99–118.

Lake, David A. 2009. "Open economy politics: A critical review." *The Review of International Organizations* 4(3):219–244.

Lee, Haillie Na-Kyung and Yu-Ming Liou. 2022. "Where You Work Is Where You Stand: A Firm-Based Framework for Understanding Trade Opinion." *International Organization* 76(3):713–740.

Lewis, Jeffrey B., Brandon DeVine, Lincoln Pitcher and Kenneth C. Martis. 2013. "Digital Boundary Definitions of United States Congressional Districts, 1789-2012.".
URL: *https://cdmaps.polisci.ucla.edu*

Lewis, Jeffrey B., Keith Poole, Howard Rosenthal, Adam Boche, Aaron Rudkin and Luke Sonnet. 2021. "Voteview: Congressional Roll-Call Votes Database.".
URL: *https://voteview.com/*

Lupia, Arthur. 1994. "Shortcuts Versus Encyclopedias: Information and Voting Behavior in California Insurance Reform Elections." *The American Political Science Review* 88(1):63–76.

Lü, Xiaobo, Kenneth Scheve and Matthew J. Slaughter. 2012. "Inequity Aversion and the International Distribution of Trade Protection." *American Journal of Political Science* 56(3):638–654.

Mansfield, Edward D. and Diana C. Mutz. 2009. "Support for Free Trade: Self-Interest, Sociotropic Politics, and Out-Group Anxiety." *International Organization* 63(3):425–457.

Margalit, Yotam. 2012. "Lost in Globalization: International Economic Integration and the Sources of Popular Discontent." *International Studies Quarterly* 56(3):484–500.

Mayda, Anna Maria and Dani Rodrik. 2005. "Why are some people (and countries) more protectionist than others?" *European Economic Review* 49(6):1393–1430.

Mayer, Wolfgang. 1984. "Endogenous Tariff Formation." *The American Economic Review* 74(5):970–985.

McGillivray, Fiona. 2004. *Privileging Industry: The Comparative Politics of Trade and Industrial Policy*. Princeton: Princeton University Press.

Melitz, Marc J. 2003. "The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity." *Econometrica* 71(6):1695–1725.

Milner, Helen V. 1988. *Resisting Protectionism: Global Industry and the Politics of International Trade*. Princeton, NJ: Princeton University Press.

Mutz, Diana, Edward D. Mansfield and Eunji Kim. 2021. "The Racialization of International Trade." *Political Psychology* 42(4):555–573.

Naoi, Megumi and Ikuo Kume. 2015. "Workers or Consumers? A Survey Experiment on the Duality of Citizens' Interests in the Politics of Trade." *Comparative Political Studies* 48(10):1293–1317.

O'Rourke, Kevin and Jeffrey G. Williamson. 1994. "Late Nineteenth-Century Anglo-American Factor-Price Convergence: Were Heckscher and Ohlin Right?" *The Journal of Economic History* 54(4):892–916.

Osgood, Iain. 2017. "The Breakdown of Industrial Opposition to Trade: Firms, Product Variety, and Reciprocal Liberalization." *World Politics* 69(1):184–231.

Owen, Erica and Noel P. Johnston. 2017. "Occupation and the Political Economy of Trade: Job Routineness, Offshorability, and Protectionist Sentiment." *International Organization* 71(4):665–699.

Palmtag, Tabea, Tobias Rommel and Stefanie Walter. 2020. "International Trade and Public Protest: Evidence from Russian Regions." *International Studies Quarterly* 64(4):939–955.

Popkin, Samuel L. 1991. *The Reasoning Voter: Communication and Persuasion in Presidential Campaigns*. University of Chicago Press.

Rho, Sungmin and Michael Tomz. 2017. "Why Don't Trade Preferences Reflect Economic Self-Interest?" *International Organization* 71(S1):S85–S108.

Rickard, Stephanie J. 2018. *Spending to Win: Political Institutions, Economic Geography, and Government Subsidies*. Cambridge: Cambridge University Press.

Rickard, Stephanie J. 2022. "Incumbents Beware: The Impact of Offshoring on Elections." *British Journal of Political Science* 52(2):758–780.

Rogowski, Ronald. 1989. *Commerce and Coalitions: How Trade Affects Domestic Political Alignments*. Princeton: Princeton University Press.

Scheve, Kenneth F. and Matthew J. Slaughter. 2001. "What determines individual trade-policy preferences?" *Journal of International Economics* 54(2):267–292.

Scheve, Kenneth and Theo Serlin. 2024. "Trains, Trade, and Transformation: A Spatial Rogowski Theory of America's 19th Century Protectionism." *American Journal of Political Science* .

Schonfeld, Bryan. 2021. "Trading Places, Trading Platforms: The Geography of Trade Policy Realignment." *International Organization* 75(4):959–990.

Simonovska, Ina and Michael E. Waugh. 2014. "The elasticity of trade: Estimates and evidence." *Journal of International Economics* 92(1):34–50.

Tinbergen, Jan. 1962. *Shaping the World Economy: Suggestions for an International Economic Policy*. New York: The Twentieth Century Fund.

Topalova, Petia. 2010. "Factor Immobility and Regional Impacts of Trade Liberalization: Evidence on Poverty from India." *American Economic Journal: Applied Economics* 2(4):1–41.

Trefler, Daniel. 1995. "The Case of the Missing Trade and Other Mysteries." *The American Economic Review* 85(5):1029–1046.

Trubowitz, Peter. 1998. *Defining the National Interest: Conflict and Change in American Foreign Policy*. Chicago: University of Chicago Press.

Walter, Stefanie. 2017. "Globalization and the Demand-Side of Politics: How Globalization Shapes Labor Market Risk Perceptions and Policy Preferences." *Political Science Research and Methods* 5(1):55–80.

Appendix to Gravity's Politics

List of Tables

List of Figures

A MODEL PROOFS

A.1 *Proof of Proposition 1*

Substituting the definitions of P_h and P_b into Equation (3) gives an equation that implicitly defines the wage ratio:

$$\left(\frac{w_b}{w_h}\right)^{1+\theta}\frac{T_hL_b}{T_bL_h} = \frac{T_b(1+(\mu t)^{-\theta}) + T_h\left(\frac{w_b}{w_h}\right)^{\theta}\left(\delta^{-\theta}+(\delta\kappa\mu t)^{-\theta}\right)}{T_b\left(\delta^{-\theta}+(\delta\kappa\mu t)^{-\theta}\right) + T_h\left(\frac{w_b}{w_h}\right)^{\theta}\left(1+(\delta^2\kappa^2\mu t)^{-\theta}\right)} \tag{9}$$

Writing the left term of (9) as

$$f(w_b/w_h) := \left(\frac{w_b}{w_h}\right)^{1+\theta}\frac{T_hL_b}{T_bL_h}$$

and the right hand side as

$$g(w_b/w_h, t) := \frac{T_b(1+(\mu t)^{-\theta}) + T_h\left(\frac{w_b}{w_h}\right)^{\theta}\left(\delta^{-\theta}+(\delta\kappa\mu t)^{-\theta}\right)}{T_b\left(\delta^{-\theta}+(\delta\kappa\mu t)^{-\theta}\right) + T_h\left(\frac{w_b}{w_h}\right)^{\theta}\left(1+(\delta^2\kappa^2\mu t)^{-\theta}\right)}$$

differentiating both sides with respect to t and rearranging gives

$$\frac{\partial\frac{w_b}{w_h}}{\partial t} = \frac{\frac{\partial g}{\partial t}}{\frac{\partial f}{\partial\frac{w_b}{w_h}} - \frac{\partial g}{\partial\frac{w_b}{w_h}}}$$

To show that this expression is negative I show that the numerator is negative and the denominator positive.

To verify that the numerator is negative, $\frac{\partial g}{\partial t} < 0$, I simplify the algebra by writing $k_b := T_b$, $k_h := T_h\left(\frac{w_b}{w_h}\right)^{\theta}$, $g_n := k_b\left(1+(\mu t)^{-\theta}\right) + k_h\left(\delta^{-\theta}+(\delta\kappa\mu t)^{-\theta}\right)$, and $g_d := k_b\left(\delta^{-\theta}+(\delta\kappa\mu t)^{-\theta}\right) + k_h\left(1+(\delta^2\kappa^2\mu t)^{-\theta}\right)$. One can then write $g\left(t, \frac{w_h}{w_b}\right) = \frac{g_n}{g_d}$.

The condition $\frac{\partial g}{\partial t} < 0$ can be written as

$$\frac{\partial g_n}{\partial t}g_d - \frac{\partial g_d}{\partial t}g_n < 0$$

To see that this inequality is satisfied, evaluate the expression.

$$\frac{\partial g_n}{\partial t}g_d = -\frac{\theta}{t}\left(k_b(\mu t)^{-\theta} + k_h(\delta\kappa\mu t)^{-\theta}\right)\left(k_b\left(\delta^{-\theta}+(\delta\kappa\mu t)^{-\theta}\right) + k_h\left(1+(\delta^2\kappa^2\mu t)^{-\theta}\right)\right)$$

$$\frac{\partial g_d}{\partial t}g_n = -\frac{\theta}{t}\left(k_b(\delta\kappa\mu t)^{-\theta} + k_h(\delta^2\kappa^2\mu t)^{-\theta}\right)\left(k_b\left(1+(\mu t)^{-\theta}\right) + k_h\left(\delta^{-\theta}+(\delta\kappa\mu t)^{-\theta}\right)\right)$$

$$-\frac{t}{\theta}\left(\frac{\partial g_n}{\partial t}g_d-\frac{\partial g_d}{\partial t}g_n\right)=k_b^2(\delta\mu t)^{-\theta}\left(1-\kappa^{-\theta}\right)+k_bk_h(\mu t)^{-\theta}\left(1-(\delta\kappa)^{-2\theta}\right)+k_h^2(\delta\kappa\mu t)^{-\theta}\left(1-\left(\delta^2\kappa\right)^{-\theta}\right)$$

For $\delta > 1$ and $\kappa \geq 1$, the right hand side is positive, and therefore because $\theta > 0$, the term in parentheses on the left hand side must be negative, implying $\frac{\partial g}{\partial t} < 0$.

To show $\frac{\partial f}{\partial \frac{w_b}{w_h}} - \frac{\partial g}{\partial \frac{w_b}{w_h}} > 0$, start by noting the following identity for the left-most term:

$$\frac{\partial f}{\partial \frac{w_b}{w_h}} = \frac{(1+\theta)f}{\frac{w_b}{w_h}}$$

Writing the numerator of g as g_n and the denominator as g_d, as above, so that $g = g_n/g_d$, the quotient rule gives

$$\frac{\partial g}{\partial \frac{w_b}{w_h}} = \frac{1}{g_d}\frac{\partial g_n}{\partial \frac{w_b}{w_h}} - \frac{g_n}{g_d^2}\frac{\partial g_d}{\partial \frac{w_b}{w_h}}$$

As g_n, g_d, and both partials are positive, that equality implies the following inequality

$$\frac{\partial g}{\partial \frac{w_b}{w_h}} < \frac{1}{g_d}\frac{\partial g_n}{\partial \frac{w_b}{w_h}}$$

Evaluating the right-hand side of this inequality gives the following identity:

$$\frac{1}{g_d}\frac{\partial g_n}{\partial \frac{w_b}{w_h}} = \frac{\theta}{\frac{w_b}{w_h}}g'$$

where

$$g' := \frac{T_h\left(\frac{w_b}{w_h}\right)^{\theta}\left(\delta^{-\theta}+(\delta\kappa\mu t)^{-\theta}\right)}{T_b\left(\delta^{-\theta}+(\delta\kappa\mu t)^{-\theta}\right)+T_h\left(\frac{w_b}{w_h}\right)^{\theta}\left(1+(\delta^2\kappa^2\mu t)^{-\theta}\right)}$$

From $T_b(1+(\mu t)^{-\theta}) > 0$, $\theta < \theta + 1$, and w_b and w_h both being positive, it follows that $\frac{\theta}{\frac{w_b}{w_h}}g' < \frac{(1+\theta)f}{\frac{w_b}{w_h}}$. That inequality, combined with $\frac{\partial g}{\partial \frac{w_b}{w_h}} < \frac{1}{g_d}\frac{\partial g_n}{\partial \frac{w_b}{w_h}}$ gives the following chain of inequalities:

$$\frac{\partial g}{\partial \frac{w_b}{w_h}} < \frac{1}{g_d}\frac{\partial g_n}{\partial \frac{w_b}{w_h}} < \frac{\partial f}{\partial \frac{w_b}{w_h}}$$

It therefore follows that $\frac{\partial f}{\partial \frac{w_b}{w_h}} - \frac{\partial g}{\partial \frac{w_b}{w_h}} > 0$ and $\frac{\partial g}{\partial t} < 0$, completing the claim that $\frac{\partial \frac{w_b}{w_h}}{\partial t} < 0$.

A.2 *Proof of Proposition 2*

(i) We want to show $F(u_b(t')/u_b(t)) > F(u_h(t')/u_h(t))$, where $t > t' \geq 1$. $F(\cdot)$ is an increasing function, so this inequality is satisfied if $u_b(t')/u_b(t) > u_h(t')/u_h(t)$, which can be rearranged to $u_b(t')/u_h(t') > u_b(t)/u_h(t)$. Showing that $\frac{\partial u_b(t)/u_h(t)}{\partial t} < 0$ then satisfies the initial inequality.

Multiplying both sides of (5) by $(w_b/w_h)^\theta$ gives

$$\left(\frac{u_b}{u_h}\right)^\theta = \left(\frac{w_b}{w_h}\right)^{1+2\theta} \frac{T_h L_b}{T_b L_h}$$

The inequality $\frac{\partial w_b(t)/w_h(t)}{\partial t} < 0$, which has been established by Lemma 1, then satisfies the initial inequality.

(ii) Given that $\varepsilon_i = 1$, $\forall i$, the share of voters in a region supporting the lower tariff is

$$s_j(t,t') = \begin{cases} 1 & \text{if } u_j(t') > u_j(t) \\ 0 & \text{if } u_j(t') \leq u_j(t) \end{cases}$$

To prove $s_b(t,t') > \frac{1}{2}$, write out u_b under the assumption $\kappa^{-\theta} = 0$:

$$u_b = \left(T_b\left(1 + (\mu t)^{-\theta}\right) + T_h \left(\frac{w_b}{w_h}\right)^\theta \delta^{-\theta}\right)^{\frac{1}{\theta}}$$

This expression is directly decreasing in t and increasing in $\frac{w_b}{w_h}$, which from Lemma 1 is also decreasing in t. $\frac{\partial u_b}{\partial t} < 0$ and so for any t, t' such that $1 \leq t' < t$, $s_b(t,t') = 1$.

To prove $s_h(t,t') < \frac{1}{2}$, write out u_h:

$$u_h = \left(T_b \left(\frac{w_b}{w_h}\right)^{-\theta} \delta^{-\theta} + T_h\right)^{\frac{1}{\theta}}$$

This expression is decreasing in $\frac{w_b}{w_h}$, which is decreasing in t, and so $\frac{\partial u_h}{\partial t} > 0$. It then follows that for any t, t' such that $1 \leq t' < t$, $s_b(t,t') = 1$.

B ADDITIONAL TABLES AND FIGURES

	Global liberalization			Region-specific liberalization		
	(1)	(2)	(3)	(4)	(5)	(6)
Exports / Total sales	0.218*		0.152*			
	(0.023)		(0.008)			
Imports / Total purchases		0.215*	0.171*			
		(0.013)	(0.005)			
Exports to region / Total sales				0.229*		0.132*
				(0.017)		(0.010)
Imports from region / Total purchases					0.212*	0.159*
					(0.005)	(0.005)
N	132	132	132	1056	1056	1056
R^2	0.563	0.729	0.972	0.617	0.810	0.967

This table presents evidence of the relationship between importing and exporting activity and the modeled welfare effects of reductions in global trade costs. In (1)–(3), the dependent variable is the welfare effect of a marginal decrease in trade costs with all world regions, converted into an elasticity, in (4)–(6) the equivalent for each of 8 world regions, estimated separately. (1)–(3) are at the FAF region level, with robust standard errors, (4)–(6) are at the FAF region-world region level, with standard errors clustered by FAF region. All models include an intercept. $^*p < 0.05$.

Table A-1: Relationship between counterfactual effects of trade liberalization, imports and exports

	Gains from global liberalization				
	(1)	(2)	(3)	(4)	(5)
Share with positive net exports	−0.030*				
	(0.008)				
Import penetration		0.074*			0.098*
		(0.025)			(0.038)
Export dependence			0.047		−0.027
			(0.024)		(0.036)
Net import penetration				0.040	
				(0.036)	
N	132	132	132	132	132
R^2	0.096	0.080	0.040	0.009	0.084

This table presents evidence of the relationship between industry-based measures of exposure to trade with all world regions, and gains from global liberalization. Data is at the FAF zone level level. The dependent variable is the elasticity of welfare to reductions in trade costs with all world regions. In (1) the independent variable is the share of manufacturing workers in industries for which exports exceed imports. Import penetration is industry-level imports divided by domestic purchases, calculated as domestic production plus imports minus exports, weighted by employment in the FAF zone across manufacturing industries. Export dependence is industry exports divided by domestic production, weighted by FAF zone manufacturing employment. Net import penetration is import penetration minus export dependence. Industry refers to 4 digit NAICS manufacturing industries. Robust standard errors in parentheses. $^*p < 0.05$.

Table A-2: Relationship between gains from liberalization with rest of world and industry-based measures of exposure to trade

	Gains from liberalization				
	(1)	(2)	(3)	(4)	(5)
Share with positive net exports	-0.002^{*}				
	(0.001)				
Import penetration		0.049^{*}			0.027
		(0.015)			(0.017)
Export dependence			0.061^{*}		0.041^{*}
			(0.019)		(0.019)
Net import penetration				0.008	
				(0.014)	
World region FE	x	x	x	x	x
N	1056	1056	1056	1056	1056
R^2	0.304	0.324	0.326	0.301	0.331

This table presents evidence of the relationship between industry-based measures of exposure to trade with all world regions, and gains from liberalization. Data is at the FAF zone level level. The dependent variable is the elasticity of welfare to reductions in trade costs with all world regions. In (1) the independent variable is the share of manufacturing workers in industries for which exports to the region in question exceed imports. Import penetration is industry-level imports to the region divided by domestic purchases, calculated as domestic production plus total imports minus total exports, weighted by employment in the FAF zone across manufacturing industries. Export dependence is industry exports to the region in question divided by domestic production, weighted by FAF zone manufacturing employment. Net import penetration is import penetration minus export dependence. Industry refers to 4 digit NAICS manufacturing industries. All models include world region fixed effects. Standard errors clustered by FAF zone in parentheses. $^{*}p < 0.05$.

Table A-3: Relationship between gains from liberalization and industry-based measures of exposure to trade

	Positive view of trade					
	(1)	(2)	(3)	(4)	(5)	(6)
Gains from global liberalization	2.129*	1.111*	0.984*	1.058*	1.255*	0.895*
	(0.411)	(0.338)	(0.331)	(0.320)	(0.489)	(0.419)
Imports via zone / total purchases			0.054	0.038	0.034	0.040
			(0.039)	(0.048)	(0.035)	(0.036)
Exports via zone / total sales			−0.013	−0.005	−0.007	−0.011
			(0.028)	(0.033)	(0.034)	(0.034)
Industry net import penetration				−0.559*	−0.374*	−0.494*
				(0.157)	(0.184)	(0.199)
Survey wave FE	x	x	x	x	x	x
Education x race x gender FE		x	x	x	x	x
State FE					x	x
Rural-urban FE						x
N	18694	18306	18306	18306	18306	14250
R^2	0.051	0.092	0.092	0.093	0.099	0.104

This table presents evidence of the relationship between gains from reductions in trade costs and positive views of trade among voters. Data is at the individual level. The dependent variable is coded as 1 if the respondent sees trade more as "an opportunity for economic growth through increased U.S. exports" than "a threat to the economy from foreign imports", 0 if not. All models include survey-wave fixed effects, (2)–(5) add fixed effects for combinations of race, education level, and gender, (3)–(6) control for imports entering and exports leaving the US through the respondent's FAF region, divided by total purchases and sales from that region, (4)–(6) control for average import penetration minus export dependence for manufacturing industries in the FAF zone, (5)–(6) add state fixed effects, (6) adds fixed effects for the 9-point rural-urban continuum value of the respondent's zip code. Observations are weighted by Gallup's survey weights. Standard errors clustered by FAF region in parentheses. $^*p < 0.05$.

Table A-4: Relationship between gains from global liberalization and positive views of trade

	Perot '92		Perot '96		Trump '16	
	(1)	(2)	(3)	(4)	(5)	(6)
Gains from global liberalization	−0.609	−0.729*	−0.646*	−0.231*	−1.047*	−0.465*
	(0.455)	(0.309)	(0.119)	(0.074)	(0.269)	(0.209)
Republican share 1988	−0.027	−0.056	0.042*	−0.014		
	(0.047)	(0.039)	(0.017)	(0.013)		
Republican share 2012					1.061*	0.914*
					(0.019)	(0.022)
Controls		x		x		x
N	3060	3060	3110	3110	3111	3111
R^2	0.025	0.240	0.166	0.586	0.923	0.965

This table presents evidence of the relationship between gains from trade liberalization and voting for anti-trade presidential candidates. Data is at the county level. In (1)–(2) the dependent variable is the share of the vote won by Ross Perot in 1992, in (3)–(4), the share won by Perot in 1996, in (5)–(6), the share of the two-party vote won by Donald Trump in 2016. Models (1)–(4) control for the Republican share of the two-party presidential vote in 1988, (5)–(6) control for the Republican share of the two-party presidential vote in 2012. (2), (4), and (6) control for the share of the population that is urban, the share that is Black, the share of those over 25 with college degrees, and the share of those over 16 employed in manufacturing. In (2) and (4) these variables are measured in 1990, in (6), 2010. All models include an intercept. Observations are weighted by the number of votes. Standard errors clustered by FAF zone in parentheses. $^*p < 0.05$.

Table A-5: Relationship between gains from liberalization and voting for anti-trade presidential candidates

	Support for free trade			
	(1)	(2)	(3)	(4)
Gains from liberalization	2.778*	3.484*	4.323*	1.708*
	(0.841)	(0.825)	(0.832)	(0.712)
Excluding	CAFTA	Peru/Colombia	KORUS	China tariffs
N	291442	306058	220138	164271
R^2	0.043	0.051	0.041	0.060

This table presents evidence of the relationship between gains from liberalization and support for free trade, excluding different survey questions in each model. Data is at the individual level. The dependent variable is coded as 1 if the respondent answer aligns with support for trade: opposition to tariffs on Chinese goods, support for the US joining CAFTA-DR and KORUS, and support for extending NAFTA to Peru and Colombia. All models include fixed effects for combinations of race, education level, and gender interacted with an indicator for the survey question and for FAF zone fixed effects, corresponding to Table 1 model (2). Model (1) excludes the survey question on CAFTA, (2) excludes the question on extending NAFTA to include Peru and Colombia, (3) excludes support for KORUS, and (4) excludes opposition to tariffs on China. Observations are weighted using CES survey weights. Standard errors clustered by FAF zone in parentheses. $^*p < 0.05$.

Table A-6: Relationship between gains from liberalization and support for trade, dropping survey questions

	Support for free trade						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Gains from liberalization	1.955*	4.086*	0.023	−4.247	2.674*	5.614*	4.240*
	(0.804)	(1.301)	(0.737)	(2.873)	(1.191)	(2.304)	(1.846)
Party x issue FE	x	x	x	x	x	x	x
Region	All	South	West	Rest	South	South	South
Party	All	All	All	All	D	R	Other
N	327129	120584	72732	133813	41212	35089	44283
R^2	0.100	0.107	0.104	0.104	0.073	0.187	0.071

This table presents evidence of the relationship between gains from liberalization and support for free trade, excluding different survey questions in each model. Data is at the individual level. The dependent variable is coded as 1 if the respondent answer aligns with support for trade: opposition to tariffs on Chinese goods, support for the US joining CAFTA-DR and KORUS, and support for extending NAFTA to Peru and Colombia. All models include fixed effects for combinations of race, education level, and gender interacted with an indicator for the survey question, for party identification interacted with an indicator for the survey question, and for FAF zone fixed effects. Models (2), (5), (6), (7) are restricted to the South census region, (3) to the West, (4) to the remaining Northeast and North Central regions. Model (5) is restricted to Democrats, (6) to Republicans, (7) to neither Democrats nor Republicans. Observations are weighted using CES survey weights. Standard errors clustered by FAF zone in parentheses. $^*p < 0.05$.

Table A-7: Relationship between gains from liberalization and support for trade, by region and party

	Favorable view of nation		
	(1)	(2)	(3)
Gains from liberalization	3.084*	−11.221*	−0.260
	(0.797)	(2.917)	(1.195)
Education x race x gender x partner FE	x	x	x
Zone FE			x
Partners	Eastern Asia	Rest of Americas	Both
N	75689	31726	107415
R^2	0.373	0.090	0.309

This table presents evidence of the relationship between gains from liberalization and whether voters hold favorable views of countries in the Eastern Asia and Rest of Americas regions. The countries in question are China, Japan, North Korea, South Korea, Taiwan, Brazil, Colombia, Cuba, Haiti, and Venezuela. Data is at the individual by partner level. The dependent variable is coded from 0 for very unfavorable to 3 for very favorable. All models include fixed effects for combinations of race, education level, gender, and the country in question. Model (1) is restricted to questions about countries in Eastern Asia, (2) to questions about countries in the Rest of Americas, (3) includes all and adds zone fixed effects. Observations are weighted by Gallup's survey weights. Standard errors clustered by FAF zone in parentheses. $^*p < 0.05$.

Table A-8: Relationship between gains from liberalization and positive views of Eastern Asian or Rest of Americas countries

	Concern about impact of trade war				
	(1)	(2)	(3)	(4)	(5)
Gains from liberalization	22.349*	9.044*	6.960		
	(5.078)	(3.625)	(6.492)		
log internal trade access				0.126*	
				(0.046)	
log internal distance trade access					0.088*
					(0.039)
Partner	Mexico	China	Both	Both	Both
Zone FE			x	x	x
N	1030	982	2012	2012	2012
R^2	0.096	0.059	0.184	0.188	0.187

This table presents evidence of the relationship between gains from liberalization, internal trade access, and concern about the imapct of a trade war with China or Mexico on the local economy of the respondent's area, using data from the 2018 Chicago Council Survey. Data is at the individual level. The dependent variable takes values between 0 and 3 ranging from "Not concerned at all" to "Very concerned" about the impacts of a trade war. All models include fixed effects for combinations of race, education level, and gender interacted with an indicator for the country in question. Models (3)–(5) add fixed effects for the respondent's FAF zone of residence. Model (1) is subset to those asked about the impact of a trade war with Mexico, (2) is subset to those asked about the impact of a trade war with China, (3)–(5) include both. The independent variable for those asked about a trade war with Mexico is the gain from liberalization or log internal trade access with Mexico, for those asked about China it is the equivalent for Eastern Asia. Observations are weighted using survey weights. Standard errors clustered by FAF zone in parentheses. $^*p < 0.05$.

Table A-9: Relationship between gains from liberalization and concerns about impact of trade wars on local economy

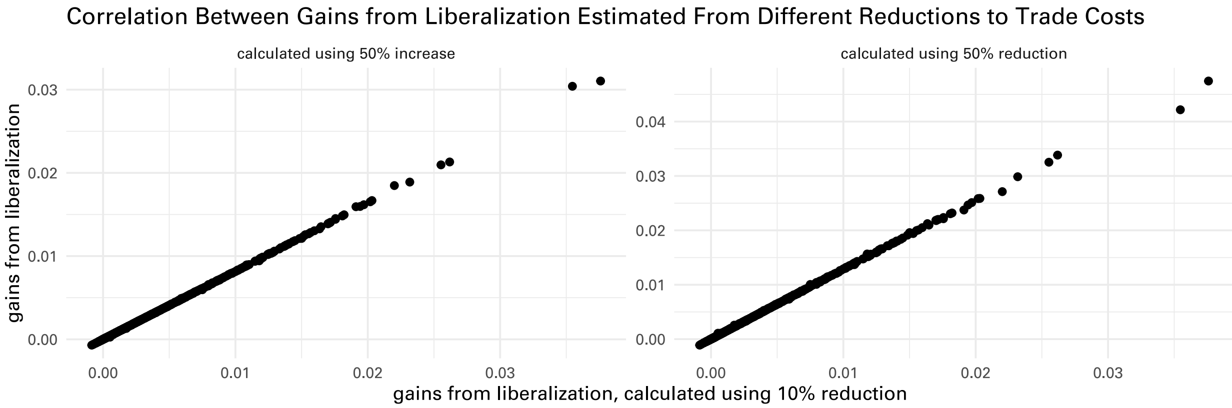

Figure A-1: Gains from liberalization are not sensitive to the magnitude of the tariff change used to calculate them them

This figure plots gains from liberalization with different world regions, the elasticity of welfare in a zone of the US to a given reduction in international trade costs with a given region, calculated from different simulations with different reductions to trade costs. On the x axis are the gains as calculated from a 10% reduction to trade costs, which is the main measure used in the paper. On the y axis in the left panel is the gain as calculated from a 50% increase to international trade costs. On the y axis of the right panel is the gain as calculated from a 50% decrease.

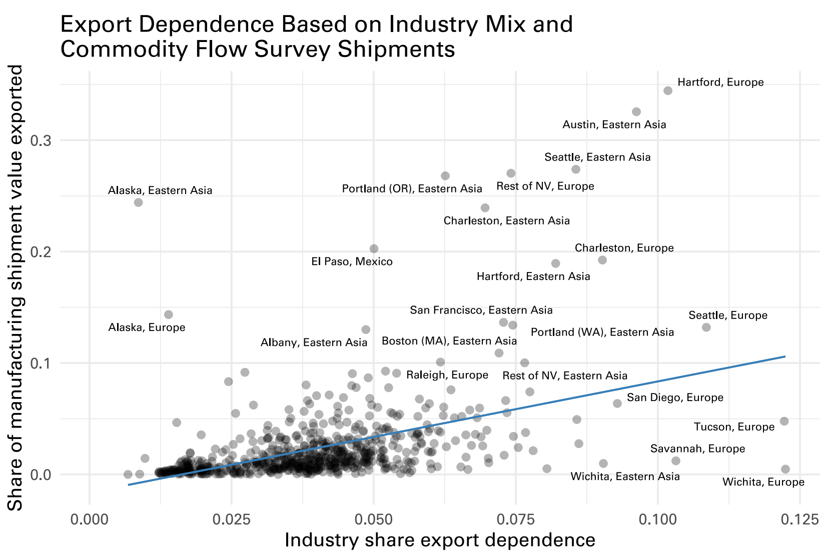

Figure A-2: Relationship between industry-based export dependence and the fraction of value of manufacturing shipments exported in the Commodity Flow Survey

The x axis is FAF zone export dependence with each world region, calculated as industry-level exports to the region divided by total industry shipments, weighted by employment in the FAF zone. Trade data is from US Trade Online, industry shipments are from the NBER manufacturing database, FAF zone employment is from the County Business Patters. All are at 4-digit NAICS level for 2016. The y axis is the share of the value of shipments from producers in the FAF zone being exported to the world region, using data from the Commodity Flow Survey.

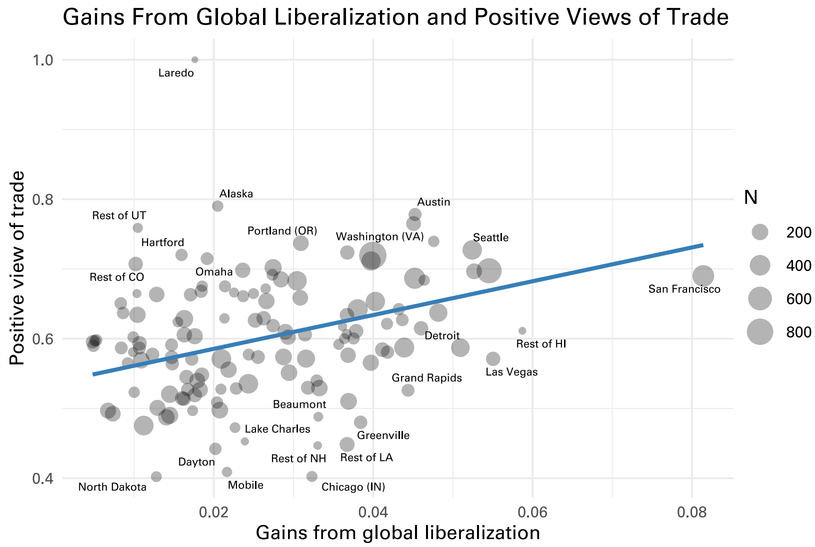

Figure A-3: Relationship between gains from trade and support for trade

Each point is the average for respondents in that FAF zone.

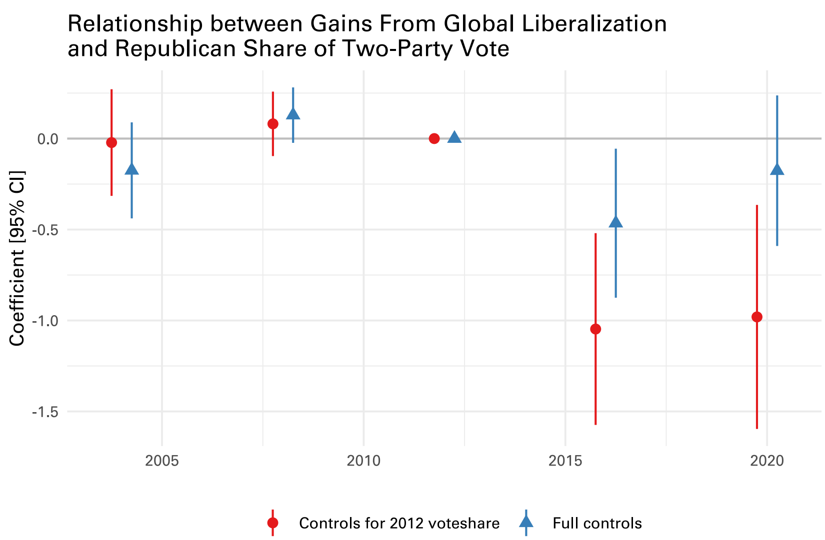

Figure A-4: Relationship between gains from liberalization and voting Republican over time

This figure shows coefficients from regressing the Republican share of the two-party presidential vote against the gains from liberalization. Red dots use an equivalent specification to Table A-5 model (5) and control for the 2012 Republican share of the two-party presidential vote, blue triangles are equivalent to model (6) of that table and also control for 2010 shares urban, Black, college educated, and employed in manufacturing. Observations are at the county level, weighted by the number of votes, with 95% confidence intervals calculated from standard errors clustered by FAF zone.

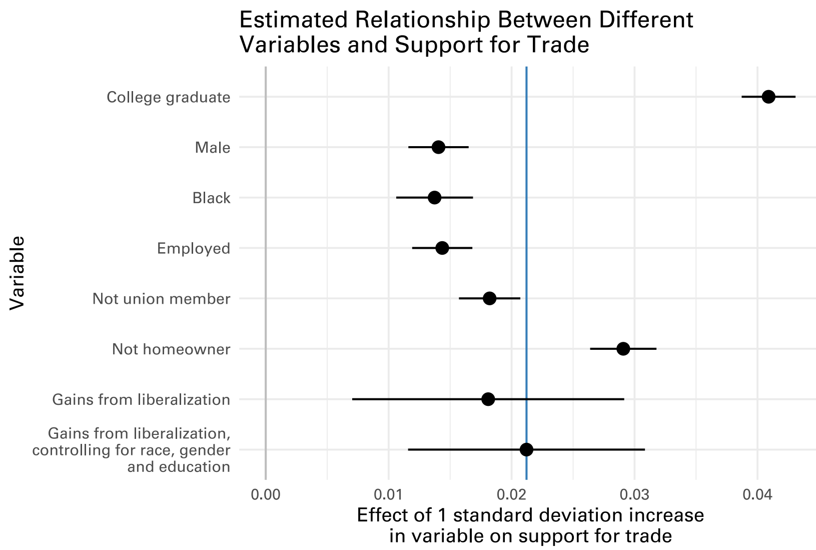

Figure A-5: Benchmarking estimated effects of gains from liberalization on support for trade to demographic differences

This figure shows coefficients from regressions of support for free trade in the Cooperative Election Survey against different demographic characteristics and the gains from liberalization. Each coefficient is from a different regression. All variables are rescaled so the standard deviation equals 1, and so the coefficent corresponds to the estimated effect of a standard deviation increase. All models include zone and question fixed effects, the bottom one also includes fixed effects for race-gender-education-question combinations. Errorbars show 95% confidence intervals calculated using robust standard errors for all except the gains from liberalization models, for which standard errors are clustered by zone. The model for black status is subset to black and white respondents only.

	Important to US economy			Important for US security		
	(1)	(2)	(3)	(4)	(5)	(6)
Gains from liberalization	3.358*			0.859		
	(1.260)			(1.296)		
log internal trade access		0.021*			0.008	
		(0.009)			(0.009)	
log internal distance trade access			0.017*			0.007
			(0.006)			(0.007)
N	22258	22258	22258	22202	22202	22202
R^2	0.140	0.140	0.140	0.118	0.118	0.118

This table presents evidence of the relationship between gains from liberalization, internal trade access, and perceptions of the importance of different countries for the US economy and US security. Data is at the individual-by-foreign country level, from the 2018 Chicago Council Survey. In models (1)–(3), the dependent variable is how important on a scale of 0 to 3 the respondent thinks relationships with the country in question are for the US economy, in (4)–(6) how important the respondent thinks relationships are for US security. All models include FAF zone fixed effects and fixed effects for combinations of race, education level, and gender interacted with an indicator for the country in question. The countries in question are Japan, China, South Korea, Germany, France, Israel, Russia, Canada, Great Britain, Mexico and India; the measures of gains from liberalization and internal trade access are for the world regions containing these countries. Observations are weighted using survey weights. Standard errors clustered by FAF zone in parentheses. $^*p < 0.05$.

Table A-10: Relationship between gains from liberalization and perceptions of importance of foreign countries for US economy and security

Table A-11: CES questions and sample sizes

Year	Full Question or Questions	Sample
2006	This year Congress also debated a new free trade agreement that reduces barriers to trade between the U.S. and countries in Central America. Some politicians argue that the agreement allows America to better compete in the global economy and would create more stable democracies in Central America. Other politicians argue that it helps businesses to move jobs abroad where labor is cheaper and does not protect American producers. What do you think? If you were faced with this decision, would you vote for or against the trade agreement?	28,101
2007	What do you think? If you were faced with this decision [CAFTA], would you vote for or against the trade agreement?	7,825
2008	Congress considered many important bills over the past two years. For each of the following tell us whether you support or oppose the legislation in principle. Roll Call Votes - Extend NAFTA Extend the North American Free Trade Agreement (NAFTA) to include Peru and Columbia	21,247
2012	Congress Considered many important bills over the past two years. For each of the following tell us whether you support or oppose the legislation in principle: U.S.-Korea Free Trade Agreement. Would remove tariffs on imports and exports between South Korea and the U.S.	52,265
2014	US - Korea Free Trade Agreement. Would remove tariffs on imports and exports between South Korea and the US.	54,905
2018	On the issue of trade, do you support or oppose the following proposed tariffs? $50 billion worth of tariffs on goods imported from China	59,881
2019	On the issue of trade, do you support or oppose the following proposed tariffs? Tariffs on $200 billion worth of goods imported from China	17,701
2020	On the issue of trade, do you support or oppose the following proposed tariffs? Tariffs on $200 billion worth of goods imported from China	60,426
2021	On the issue of trade, do you support or oppose the following proposals? 20 percent tariffs on goods imported from China	25,682

C ADDITIONAL DETAIL ON VARIABLE CONSTRUCTION

C.1 *Trade Access*

This subsection provides additional detail on two alternative measures of trade access used in the empirical analysis.

These measures are averages of internal inverse trade costs with export hubs—locations in the US where exports enter and leave—for each zone z and world region j, calculated according to the following formula:

$$\textit{average internal inverse trade cost}_{zj} = \frac{1}{2}\left(\frac{\sum_o M^o_{j,-z}\tau_{oz}^{-\theta}}{\sum_o M^o_{j,-z}} + \frac{\sum_d X^d_{j,-z}\tau_{zd}^{-\theta}}{\sum_d X^d_{j,-z}}\right) \tag{10}$$

In this expression, $M^o_{j,-z}$ are total imports to zones of the US other than z from partner j, entering through US zone o, $X^d_{j,-z}$ are exports from zones of the US other than z to partner j exiting through US zone d, and τ_{oz} and τ_{zd} are trade costs between o and z and z and d. This variable calculates the weighted average inverse internal trade cost between each FAF zone z, and the zones through which imports and exports with a particular trading partner j are routed, weighted by the importance of each of these zones for imports and exports, leaving out imports and exports by the zone in question. I leave out z's imports and exports to avoid picking up factors other than trade costs that influence whether z engages in international trade.

I calculate two versions of this variable using different measures of inverse trade cost $\tau_{od}^{-\theta}$. First, I calculate Head and Ries's measure of inverse trade costs following Equation (8) with data from the Freight Analysis Framework. I refer to the measure of average inverse trade costs calculated following Equation (10) with these inverse trade costs as *internal trade access.*

For the second of these measures, I predict inverse trade costs using geographic distance. I do so by regressing the logarithm of the inverse trade costs backed out of internal trade flows against log geographic distance and an indicator that the origin equals the destination, and use the estimated coefficients to predict inverse trade costs:

$$\ln \tau_{od}^{-\theta} = \beta_0 + \beta_1 \ln \text{Distance}_{od} + \beta_2 \mathbf{1}_{\{o=d\}} + \varepsilon_{od};$$

$$\hat{\tau}_{od}^{-\theta} = \exp\left(\beta_0 + \beta_1 \ln \text{Distance}_{od} + \beta_2 \mathbf{1}_{\{o=d\}}\right).$$

I refer to the measure of inverse trade costs calculated with these distance-predicted inverse trade costs as *internal distance trade access.*

These internal trade access measures more transparently capture the role of internal geography for international trade. This transparency comes at the costs of imposing more structure on internal trade costs relative to the modeled gains from liberalization measures, and of not corresponding as directly to a theoretical quantity—the potential increase in welfare—that should influence support for liberalization.

C.2 *Import Penetration*

I calculate net import penetration by allocating industry-level import penetration and export dependence to FAF zones, according to the following formula:

$$\textit{Net import penetration}_{zj} = \sum_i \underbrace{\frac{L_{iz}}{\sum_i L_{iz}}}_{\text{share employed in } i} \left(\underbrace{\frac{M_{ij}}{M_i + Y_i - X_i}}_{\text{import penetration}} - \underbrace{\frac{X_{ij}}{Y_i}}_{\text{export dependence}} \right)$$

where L_{iz} is employment in industry i in zone z, M_{ij} is imports of goods in industry i from partner j, M_i is total imports in industry i, Y_i total production, X_i total exports, and X_{ij} exports of i to j. I use employment data from the County Business Patterns (Eckert et al., 2020), trade data from USA Trade Online, and industry production data from the NBER-CES manufacturing database, all at the 4-digit NAICS level.

C.3 *Imputing Trade Data*

The primary source for zone-specific trade data is the 2017 Freight Analysis Framework. One potential limitation is that the survey data is from various years. Using 2017 trade data thus introduces measurement error. To address this concern in a robustness check I use port-by-country import and export data from the Census Bureau and impute trade data for other years. Write the value of imports entering location o of the US from world region f in year t as $m_{f,o,t}$, and the value of exports to world region f leaving location d of the US at t as $e_{d,f,t}$. This data is provided by the Census Bureau. Write shipments from location o to location d, recorded in the 2017 FAF, as X_{od}. Write imports from f to d imported via o as $x_{f,o,d}$, and exports from o to f via d as $x_{o,d,f}$. Total imports to d from f are then $X_{fd} = \sum_o x_{f,o,d}$, and total exports to f from o are $X_{of} = \sum_d x_{o,d,f}$. Total exports shipped to f via d are $\sum_o x_{o,d,f}$. To impute trade flows in year t, $X_{fd,t}$ and $X_{of,t}$, I scale trade flows in 2017 by changes in the magnitude of imports and exports passing via each zone:

$$X_{fd,t} = \sum_o x_{f,o,d} \left(\frac{m_{f,o,t}}{m_{f,o,2017}} \right), \; X_{of,t} = \sum_d x_{o,d,f} \left(\frac{e_{d,f,t}}{e_{d,f,2017}} \right)$$

I then use the resultant year-specific measures of trade flows to calculate the various independent variables and controls. Table A-13 replicates Table 1 using these variables.

	Support for free trade				
	(1)	(2)	(3)	(4)	(5)
Gains from liberalization (2012)	1.789^*	2.634^*	1.775^*		
	(0.419)	(0.378)	(0.863)		
log internal trade access (2012)				0.041^*	
				(0.008)	
log internal distance trade access (2012)					0.036^*
					(0.008)
Imports via zone / total purchases (2012)			-0.057	-0.148^*	-0.225^*
			(0.061)	(0.071)	(0.093)
Exports via zone / total sales (2012)			0.195	0.065	0.035
			(0.101)	(0.078)	(0.085)
Industry net import penetration			1.893^*	1.938^*	1.927^*
			(0.336)	(0.314)	(0.312)
Education x race x gender x question FE	x	x	x	x	x
Zone FE		x	x	x	x
Rural-urban x question FE			x	x	x
N	327303	327303	327218	327218	327218
R^2	0.045	0.049	0.052	0.052	0.052

This table replicates Table 1, on the relationship between gains from liberalization and support for free trade, using data from the 2012 FAF in places of the 2017 FAF. Industry net import penetration is already calculated using year-specific trade data from the Census Bureau. Data is at the individual level. The dependent variable is coded as 1 if the respondent answer aligns with support for trade: opposition to tariffs on Chinese goods, support for the US joining CAFTA-DR and KORUS, and support for extending NAFTA to Peru and Colombia. Models (1)–(3) examine the correlates of gains from liberalization with Eastern Asia in the case of Chinese tariffs and KORUS, and Rest of America in the case of CAFTA-DR and NAFTA extension, (4) examines the the correlates of average internal trade access, the average internal inverse trade cost with locations where imports from and exports to the world region in question enter the country, weighted by the value of import or exports entering in that location, (5) examines the equivalent where internal trade costs are first predicted using geographic distance. All models include fixed effects for combinations of race, education level, and gender interacted with an indicator for the survey question, (2)–(5) control for FAF zone fixed effects, (3)–(5) control for imports from and exports to the region leaving or entering the US in the FAF zone divided by total purchases and sales, for average manufacturing industry import penetration minus export dependence with the country or group of countries in question, and for fixed effects for the 9-point rural-urban continuum value of the respondent's zip code interacted with an indicator for the survey question. Observations are weighted using CES survey weights. Standard errors clustered by FAF zone in parentheses. $^*p < 0.05$.

Table A-12: Relationship between gains from liberalization and support for trade, with 2012 FAF data

	Support for free trade				
	(1)	(2)	(3)	(4)	(5)
Gains from liberalization (year-specific)	2.937*	4.341*	3.629*		
	(0.417)	(0.808)	(1.007)		
log internal trade access (year-specific)				0.040*	
				(0.008)	
log internal distance trade access (year-specific)					0.030*
					(0.008)
Imports via zone / total purchases (year-specific)			0.019	0.021	0.014
			(0.044)	(0.047)	(0.052)
Exports via zone / total sales (year-specific)			0.089	0.039	0.051
			(0.048)	(0.051)	(0.047)
Industry net import penetration			1.796*	1.969*	1.971*
			(0.369)	(0.337)	(0.340)
Education x race x gender x question FE	x	x	x	x	x
Zone FE		x	x	x	x
Rural-urban x question FE			x	x	x
N	327303	327303	294302	294302	294302
R^2	0.046	0.050	0.052	0.052	0.052

This table replicates Table 1, on the relationship between gains from liberalization and support for free trade, imputing year-specific variables with the 2017 FAF and year-by-port trade data from the Census Bureau. Import pentration in all analyses is calculated with year-specific Census Bureau trade data. Data is at the individual level. The dependent variable is coded as 1 if the respondent answer aligns with support for trade: opposition to tariffs on Chinese goods, support for the US joining CAFTA-DR and KORUS, and support for extending NAFTA to Peru and Colombia. Models (1)–(3) examine the correlates of gains from liberalization with Eastern Asia in the case of Chinese tariffs and KORUS, and Rest of America in the case of CAFTA-DR and NAFTA extension, (4) examines the the correlates of average internal trade access, the average internal inverse trade cost with locations where imports from and exports to the world region in question enter the country, weighted by the value of import or exports entering in that location, (5) examines the equivalent where internal trade costs are first predicted using geographic distance. All models include fixed effects for combinations of race, education level, and gender interacted with an indicator for the survey question, (2)–(5) control for FAF zone fixed effects, (3)–(5) control for imports from and exports to the region leaving or entering the US in the FAF zone divided by total purchases and sales, for average manufacturing industry import penetration minus export dependence with the country or group of countries in question, and for fixed effects for the 9-point rural-urban continuum value of the respondent's zip code interacted with an indicator for the survey question. Observations are weighted using CES survey weights. Standard errors clustered by FAF zone in parentheses. $^*p < 0.05$.

Table A-13: Relationship between gains from liberalization and support for trade, with imputed year-specific trade data